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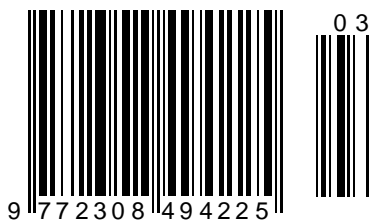
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PROPAGATION OF WAVES IN A LAYER OF DEFORMABLE MEDIA

Abstract: This article discusses the propagation of free waves in flat bodies. In the calculation, the materials of the layers are assumed to be elastic (or viscoelastic). We will consider the passage of waves harmonic in time along a layered medium. Solving this problem, we obtain the relationship between the wave speed and its length. It is established that at $L/\lambda=0.5$ the first modes of the phase velocity increase monotonically depending on L/λ.

Key words: viscoelastic layer, free wave, plane body, wave, phase velocity, three-layer body, mathematical methods.

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РАСПРОСТРАНЕНИЕ ВОЛН В СЛОЕ НАХОДЯЩИХСЯ В ДЕФОРМИРУЕМЫХ СРЕДАХ

Аннотация: В этой статье рассматривается распространение свободных волн в плоских телах. При расчете материалы слоев предполагаются упругими (или вязкоупругими). Будем рассматривать прохождения гармонических во времени волн вдоль слоистую среду. Решая эту задачу, получим зависимость между скоростью волны и ее длиной. Установлено, что при $L/\lambda=0.5$ первые моды фазовой скорости в зависимости от L/λ монотонно возрастает.

Ключевые слова: вязкоупругий слой, свободная волна, плоская тела, волна, фазовая скорость, трехслойная тела, математические методы.

Введение

Проблемы распространения волн в сплошных многослойных системах привлекают внимание многочисленных исследователей в нашей стране и за рубежом [1,2]. Это обусловлено тем, что во многих областях науки и техники все чаще приходится сталкиваться с необходимостью расчета полей напряжений и деформаций, возникающих в слоистых телах с разными реологическими свойствами при воздействии различного рода динамических нагрузок.

Динамические задачи диссипативных (вязкоупругих) динамических систем решаются методами математической физики. Сложность их решения объясняется многими причинами, например, реологическими свойствами реальных сред (анизотропия, вязкость, ползучесть, пластичность, неоднородности и т. п.), что обусловливает большое разнообразие схематизированных моделей для описания в том или ином приближении реальных явлений и не позволяет создать единую математическую модель

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механической системы [3,4]. Несмотря на большое число математических моделей механической системы, математические методы решения задач разработаны, главным образом, для таких систем, как акустические, упругие движения которых описываются линейными дифференциальными уравнениями [5,6]. В [7,8] предпринята, попытка определить и оптимизировать диссипативные характеристики, а также напряженно-деформированное состояние механических систем. В данном параграфе рассматривается задача распространения волн напряжения в трехслойной полосе (рис.1). Данная задача относится к проблемам распространения волн напряжения в слоистой среде, часто встречается в научных

[9,10,11,12], публикациях по этим вопросам вследствие их большого значения в геофизике и строительстве. Однако детально разработаны вплоть до численных результатов только те задачи, которые приводят к реальному решению. Комплексными решениями, получение которых достаточно сложно, до сих пор пренебрегали, как не имеющими большого значения.

2. Постановка задачи и методики решения

Рассмотрим деформируемый (упругий или вязкоупругий) трехслойной полосе толщиной h, со свободными поверхностями и пусть в нем распространяется гармоническая волна с фазовой скоростью C (рис.1).
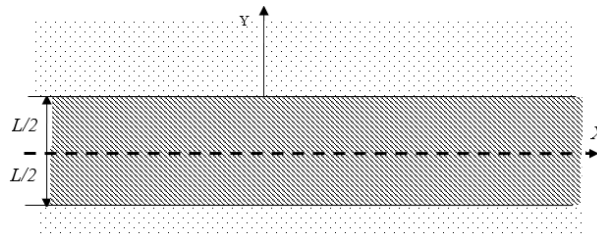

Рис. 1. Расчетная схема.

Ниже мы рассмотрим плоскую задачу, где перемещения не зависят от координаты Z. Математически эта задача формулируется следующим образом:

$$\rho_j \frac{\partial^2 u_j}{\partial t^2} = \frac{\partial \sigma_{xx}^{(j)}}{\partial x} + \frac{\partial \sigma_{xy}^{(j)}}{\partial y};$$
$$\rho_j \frac{\partial^2 \vartheta_j}{\partial t^2} = \frac{\partial \sigma_{yy}^{(j)}}{\partial y} + \frac{\partial \sigma_{xy}^{(j)}}{\partial x}, \quad (1)$$

где ρ_j – плотность материала; u_j и ϑ_j соответственно, перемещения по направлениям x и y; (j=1,2,3), j – номер слоя. Теперь рассмотрим решение дифференциального уравнения (1) для одного слоя. Тогда вместо $\sigma_{xx}^{(j)}$, $\sigma_{yy}^{(j)}$, и $\sigma_{xy}^{(j)}$ подставляем следующие выражения:

$$\sigma_{xx}^{(j)} = \lambda_j \theta_j + 2\mu_j \frac{\partial u_j}{\partial x};$$
$$\sigma_{xy}^{(j)} = \mu_j \left(\frac{\partial u_j}{\partial y} + \frac{\partial \vartheta_j}{\partial x} \right),$$
$$\sigma_{yy}^{(j)} = \lambda_j \theta_j + 2\mu_j \frac{\partial \vartheta_j}{\partial y}. \quad (2)$$

где $\theta_j = \frac{\partial u_j}{\partial y} + \frac{\partial \vartheta_j}{\partial x}$ - объемное расширение. Подставляя (2) в (1), решение уравнения (1) принимает вид:

$$и_j = U_j(y)\, e^{i(\omega t - \gamma x)};$$
$$\vartheta_j = V_j(y)\, e^{i(\omega t - \gamma x)},$$

ω – круговая частота, $\omega=2\pi n$, n – частота колебаний; $\lambda=2\pi/\gamma$ - длина волны. Подставим (2) в (1), тогда получим следующие обыкновенные дифференциальные уравнения в виде:

$$L_j \frac{dV_i}{dy} - L_{2j} U_j - G_j \frac{d^2 U_j}{dy^2} = 0;$$

$$L_j \frac{dU_j}{dy} - L_{3j} V_j - L_{4j} \frac{d^2 V_j}{dy^2} = 0; \quad (3)$$

где

$$L_{1j} = \left(\frac{E_j v_j}{1 - v^2_j} + G_j \right) i\gamma; \quad L_{2j} = \rho_j \omega^2 - \frac{E_j}{1 - v_j^2}\gamma^2;$$

$$L_{3j} = \rho_j \omega^2 - G_j \gamma^2; \quad L_{4j} = \frac{E_j}{1 - v_j^2}.$$

После введения вспомогательной функции Φ_j (y) отношениями

$$U_j = L_{Ij} \frac{d}{dy} \Phi_j; \quad V_j = \left[L_{2j} + G_j \frac{d}{dy^2} \right] \Phi_j,$$

получим из (3) дифференциальное уравнение четвертого порядка

$$\frac{d^4 \Phi_j}{dy^4} + L_{5j} \frac{d^2 \Phi_j}{dy^2} + L_{6j} \Phi_j = 0, \quad (4)$$

где

$$L_{5j} = -2\gamma^2 + \frac{(3-v_j)\omega^2}{2c_{sj}^2};$$

$$L_{6j} = \gamma^2 - \frac{(3-v_j)\omega^2\gamma^2}{2c_{sj}^2} + \frac{\omega^4}{c_{pj}^2 c_{sj}^2};$$

В случае вязкоупругого материала E_j заменяется (4) комплексными величинами, тогда $C_{pj} = C_{pRj} + i\, C_{pIj}$; $C_{sj} = C_{sRj} + i\, C_{sIj}$; C_{pj}, C_{sj} - соответственно, скорости распространения продольных и поперечных волн; C_{pRj} - скорости распространения продольных волн; C_{pIj} - скорости распространения поперечных волн; C_{sRj} - скорости затухания продольных волн, C_{sIj} - скорости затухания поперечных волн.

Решение уравнений (4) выражается через экспоненциальные функции
$$\Phi_j(y) = A_j e^{+\alpha_j y} + B_j e^{-\alpha_j y} + C_j e^{S_j y} + D_j e^{-S_j y}, (5)$$

где $\quad \alpha_j^2 = \gamma^2(1 - \frac{c^2}{c_{pj}^2}); S_j^2 = \gamma^2(1 - \frac{c^2}{c_{Sj}^2})$,

где A_j, B_j , C_j , D_j - произвольные постоянные, которые определяются из граничных условий. В случае

$(E_j(\omega)=E_j, \eta_j(\omega)=0)$ $\quad \frac{c^2}{c_{pj}^2} > 1$ и $\frac{c^2}{c_{sкj}^2} > 1$, тогда

решение (5) выражается через тригонометрические функции. С помощью уравнений (3) выражаются смещения. Решение уравнения для первого и второго слоя записывается следующим образом

$$u_j = i\gamma[A_j q_j \exp(q_j y) - B_j q_j \exp(-q_i y) +$$
$$+C_j S_j \exp(S_j y) - D_j S_j \exp(-S_j y)]e^{i(wt-\gamma x)},$$
$$\vartheta_j = [-A_j q_j \exp(q_{\quad j} y) - B_j q_j \exp(q_j y) -$$
$$-C_j \gamma^2 \exp(S_j y) - D_j \gamma^2 \cos(-S_j y)]e^{i(wt-\gamma x)}. \quad (6)$$

Решение (6) –для полупространства записывается в виде:

$$u_2 = i\gamma(A_3 q_3 \sin(q_3 y) - B_3 . q_3 \cos(q_3 y) +$$
$$+C_3 . S_3 e^{S_3 y} - D_3 . S_3 e^{-S_3 y})e^{i.(wt-\gamma x)};$$

$$v_2 = [A_3 q_3^2 e^{q_3 y} - B_3 . q_3^{-q_3 y} -$$
$$-C_3 \gamma^2 e^{S_3 y} - D_3 \gamma e^{-s_3 y}]e^{i.(wt-\gamma x)}, \quad (7)$$

где

$$q_j = \gamma\sqrt{1 - \frac{c^2}{c_{pj}^2}}; \quad s_j = \gamma\sqrt{1 - \frac{c^2}{c_{sj}^2}};$$

$c_{pj}^2 = (\lambda_j + 2\mu_j)/\rho_j; \quad c_{sj}^2 = \mu_j/\rho_j; \quad i = 1,2,3$

ω - круговая частота; Aj, B_j, C_j, D_j - произвольные постоянные, которые определяются из граничных условий. Решения (7) должны удовлетворять условию экспоненциального затухания по координате y (у $\to \infty$). Тогда решение (7) для у $\geq$ L∕2 и у $\leq$ -L / 2 принимает вид:

$$u_3 = (-B_3 i_3 \gamma_3 q_3 e^{-q_3 y} - D_3 . i\gamma S_3 e^{-q_3 y})e^{i.(wt-\gamma x)}$$

$$\vartheta_3 = (B_3 i\gamma q_3^2 e^{-q_3 y} - D_3 i\gamma^2 e^{-q_3 y})e^{i.(wt-\gamma x)}. \quad (8)$$

В симметричном движении слоя решение при – L/2 ≤ у ≤ L/2 записывается в виде

$$u_1 = (A_1 . i . \gamma_1 . q_1 \cos x (q_2 y) + C_2 \cdot i \cdot \gamma$$
$$\cdot S_2 \cos x (S_2 y))e^{i(\omega t - \gamma x)},$$
$$\vartheta_2 = (-A_1 . q_2^2 \cdot \sin x (q_2 y) - C_2 \cdot$$
$$\gamma^2 \sin x (S_2 y))e^{i(\omega t - \gamma x)}, \quad (9)$$

На контакте у = ± L/2 выполняются условия равенства перемещений и напряжений

$$\left(u_1^{(1)}\right)_{y=L/2} = \left(u_1^{(2)}\right)_{y=L/2};$$
$$\left(u_1^{(2)}\right)_{y=L/2} = \left(u_1^{(3)}\right)_{y=-L/2};$$
$$\left(\vartheta_1^{(1)}\right)_{y=L/2} = \left(\vartheta_1^{(2)}\right)_{y=L/2};$$
$$\left(v_1^{(2)}\right)_{y=-L/2} = \left(v_1^{(3)}\right)_{y=-L/2};$$
$$\left(\sigma_{yy}^{(1)}\right)_{y=L/2} = \left(\sigma_{yy}^{(1)}\right)_{y=L/2};$$
$$\left(\sigma_{yy}^{(2)}\right)_{y=-L/2} = \left(\sigma_{yy}^{(3)}\right)_{y=-L/2};$$
$$\left(\sigma_{xy}^{(1)}\right)_{y=L/2} = \left(\sigma_{xy}^{(1)}\right)_{y=L/2};$$
$$\left(\sigma_{xy}^{(2)}\right)_{y=-L/2} = \left(\sigma_{xy}^{(3)}\right)_{y=-L/2}. \quad (10)$$

На свободной поверхности у = l + L/2 ставится условие свободы от напряжений

$$\sigma_{yy}^{(1)} = \sigma_{xy}^{(1)} = 0. \quad (11)$$

Для определения произвольных постоянных A_j, B_j, C_j, D_j (j=1,2,3) использования граничных усилий жесткого контакта (10) и (11) в результате получим 12 алгебраических уравнений 12 неизвестными в виде

$$[C]\{q\} = \{0\},$$

где [C] квадратная матрица (12x12), элементы которых выражается через тригонометрические и экспоненциальные функции. Необходимым и достаточным условием существования решения этой системы является равенство нулю ее детерминанта.
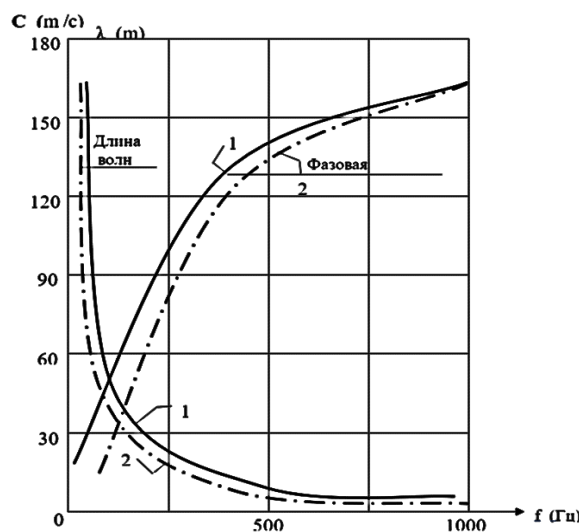

Рис.2 Кривая изменения фазовых скорости изгибных волн напряжения С и длины волны λ в зависимости от частоты. 1-теоретическое результаты; 2-экспериментальные результаты. 3. В качестве тестовых задач приведем элементы дисперсионного уравнение для двух слой них тел со свободными поверхностными.

Рассмотрим следующие два случая: пусть с < c_2, тогда q_j и S_j являются действительными числами. Тогда частотное уравнение принимает следующий вид:

$$|\Delta(a_{ij})| = 0, \quad i = 1,2,....8; \quad j = 1,2......8; \quad (12)$$

где

$$a_{11} = q_2 \cos(q_2 L / 2),$$
$$a_{12} = s_1 \cos(s_1 L / 2),$$
$$a_{13} = q_1 e^{-q_2 L/2},$$
$$a_{14} = s_2 e^{-s_2 1/2},$$
$$a_{21} = -q_2^2 \sin(q_2 L/ 2),$$
$$a_{22} = -\gamma^2 \cos(s_1 L/2),$$
$$a_{41} = 2 \cdot q_1^2 \sin(q_1 L/2)$$
$$a_{42} = (s_1^2 + \gamma^2) \sin(s_1 L/2);$$

$$a_{43} = -\rho_1 \cdot E_{22}^2 \cdot (s_2^2 + \gamma^2) e^{-s_2 l/2},$$
$$a_{44} = -\rho_1 \cdot E_{22}^2 \cdot (s_2^2 + \gamma^2) e^{-s_2 l/2},$$
$$\rho_0 = \rho_2/\rho_1,$$
$$E_{11} = C_{p2}/C_{p1},$$
$$E_{22} = C_{s_2}/C_{s1}.$$

Основной целью работы является исследование изменения фазовой скорости C_{RJ} зависимости от длины волны, геометрических и физико-механических параметров системы. В рассматриваемом случае, (если $E_1 = E_2$; $\nu_1 = \nu_2$; $\rho_1 = \rho_2$, тогда слоя и среде работают как одно целое) $\gamma = \gamma_R$, где $\gamma_R = 2 \cdot \pi \lambda$-действительная часть волнового числа; λ - длина волны; $C = \omega/\gamma_R$. Частотное уравнение (12) решается методом Мюллера.
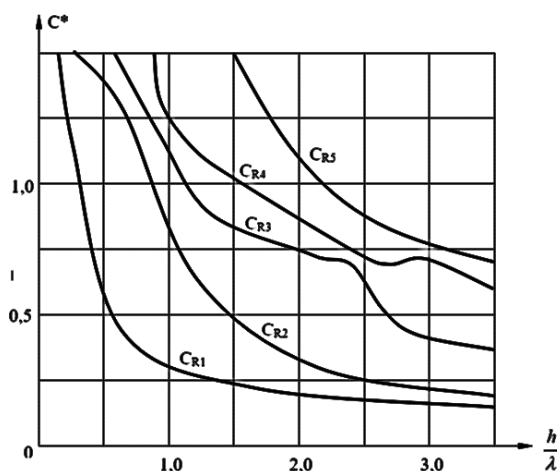
Рис. 3 Изменение фазовых скоростей (C^{*}_R) в зависимости от длины волн

Заметим, что предложенный алгоритм расчета корней уравнения (1) дает удовлетворительные результаты для малых и больших волновых числах. Численные результаты получены при следующих параметрах слоя и окружающего его среды: C_{p1}=2 300 м/с, C_{s1}=1300 м/с, ν_1=0,35, ρ_1=0,12 кг/м^3; C_{p2}=5400 м/с, C_{s2}=3100 м/с, ν_2=0,3, ρ_2=0,28 кг/м$^{3.}$

На рис 2. изображено сравнение теоретических (сплошная линия) и экспериментальных пунктирная линия результатов

[10]. Из рисунка 2 видно, что при длинных волнах теоретические и экспериментальные результаты почти совпадают с ризницами 10-15%.

Исследовано изменение первые пяти фазовых скоростей от λ (длины волн), для значений параметров ($\alpha = 1$). Результаты расчетов представлены на рис.2. Из рис. 3 видно, что коренное влияние соприкосновения тела с основанием проявляется в области низких частот, когда соотношения $h/\lambda < 0,12$.

Рис.3. 1-по работе [37], 2 –по предлагаемой методике.

l/λ		0,2	0,4	0,6	0,8	1,0	9,0
$(c/c_0)_1$	1	0,9934	0,951	0,793	0,679	0,620	0,573
	2	0,9927	0,9493	0,7871	0,6792	0,6199	0,5725
$(c/c_0)_2$	1	3,37	1,955	1,503	1,28	1,143	0,772
	2	3,3683	1,9473	1,4982	1,2793	1,1427	0,7716
$(c/c_0)_3$	1			3,152	1,677	1,423	1,155	0,808
	2			3,0965	1,6698	1,4177	1,1482	0,8121
$(c/c_0)_4$	1			4,043	2,706	2,169	1,805	1,155
	2			3,9922	2,6763	2,0781	1,7932	1,1472

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Пусть с > с$_2$, тогда q_j и S_j являются комплексными числами**.** В этом случае корны частотное уравнение (12) станут мнимыми, т.е. свободное волны не существует.

Рассмотрим распространение свободных волн в полосе, находящейся в упругой безгранимной среде (рис. 1). Тогда решение уравнения (1) с учетом (2) примет вид

$$U_2 = i\gamma(A_2 q_2 \cos q_2\, y + B_2 q_2 Sin q_2 y$$
$$+ C_2 S_2 \cos S_2\, y$$
$$+ D_2 S_2 Sin S_2 y)e^{i(\omega t - \gamma x)};$$
$$-L/2 \le y \le L/2$$
$$\vartheta_2 = \left(-A_q q_2^2 Sin q_2 y - B_2 q_2^2 Cos q_2 y - C_2 \gamma^2 Sin S_2 y\right.$$
$$\left.- - D_2 \gamma^2 Cos S_2 y\right)e^{i(\omega t - \gamma x)}$$
$$U_1 = i\gamma(A_1 q_1 e^{q_1 y} + B_1 q_1 e^{-q_1 y} + C_1 S_1 e^{S_1 y} +$$
$$+ D_1 S_1 e^{-S_1 y})e^{i(\omega t - \gamma x)}, \quad -L/2 \le y \le L/2$$
$$\vartheta_1 = \left(-A_1 q_1^2 e^{q_1 y} - - B_1 q_1^2 e^{-q_1 y} - C_1 \gamma^2 e^{S_1 y} -\right.$$
$$\left.D_1 \gamma^2 e^{S_1 y}\right)e^{i(\omega t - \gamma x)}; y \ge L/2; \quad y \le -L/2.$$

Здесь $A_1, B_1, C_1, Д_1, A_2, B_2, C_2, Д_2$ произвольные постоянные;

$$q_j = \gamma\sqrt{1 - \frac{c^2}{c_{pj}^2}}; \qquad s_j = \gamma\sqrt{1 - \frac{c^2}{c_{sj}^2}}; \quad (\tau = 1,2)$$

Введены параметры $\rho_0 = \rho_1/\rho_2$; $\quad \overline{C_p} = C_{p1}/C_{p2}$; $\overline{C_2} = C_{S1}/C_{S2}$.

Рассмотрим дисперсионное соотношение для симметричных волн. В этом случае перемещение среды при $y \ge L/2$ и $y \le -L/2$

$$U_1 = \left(-B_1 i\gamma q_1 e^{\mp q_1 y} - D_1 i\gamma s_1 e^{\mp s_1 y}\right)e^{i(\omega t - \gamma x)};$$
$$V_1 = \left(\mp B_1 q^2_1 e^{\mp q_1 y} \mp D_1 \gamma^2 s_1 e^{\mp s_1 y}\right)e^{i(\omega t - \gamma x)}.$$

Перемещения слоя $–L/2 \le y \le L/2$ принимает следующий вид:

$$V_2 = \left(-A_2 q_2{}^2 \sin q_2\, y - C_2 \gamma^2 s_1 \sin s_2 y\right)e^{i(\omega t - \gamma x)};$$
$$U_2 = \left(A_2 i\gamma q_2 \cos q_2\, y + C_2 i\gamma s_2 \cos s_2\, y\right)e^{i(\omega t - \gamma x)}.$$

На границе контакте $y = \pm L/2$ выполняется условия равенство напряжений и перемещений

$$|a_{ij}| = 0; i = 1,2,3,4; j = 1,2,3,4;$$

где

$$a_{11} = q_2 Cos\frac{q_2 L}{2};$$
$$a_{21} = -q_2^2 Sin\frac{q_2 L}{2};$$
$$a_{12} = S_2 Cos\frac{S_2 L}{2};$$
$$a_{13} = q_1 e^{-q_1\frac{L}{2}};$$
$$a_{14} = S_1 e^{-S_1\frac{L}{2}};$$
$$a_{22} = -\gamma^2 Sin\frac{S_2 L}{2}; \qquad a_{23} = -q_1^2 e^{-q_1\frac{L}{2}};$$
$$a_{24} = \gamma^2 e^{-\frac{S_1 L}{2}}; \quad a_{32} = -S_2\gamma^2(1 - \nu_2)Cos\frac{q_2 L}{2};$$
$$a_{33} = -\rho_0\overline{\varepsilon_2^2}q_1(q_1^2 - \nu_1\gamma^2)e^{-\frac{q_1 L}{2}};$$
$$a_{42} = (S_2^2 + \gamma^2)Sin\frac{S_2 L}{2};$$
$$a_{34} = -\rho_0\overline{C_p}S_1\gamma^2(1 - \nu_1)e^{\frac{\rho_1 L}{2}};$$
$$a_{41} = 2q_2^2 Sin\frac{q_2 L}{2};$$

$$a_{43} = -2\rho_0\overline{C_p}q_1^2 e^{-\frac{q_1 L}{2}};$$
$$a_{44} = -\rho_0\overline{C_\rho}(S_1^2 + \gamma^2)e^{-\frac{S_2 L}{2}}.$$

В первом случае рассмотрим следующие соотношение параметров $\rho_0 > 1$; $\overline{C_p} > 1$. Результате расчетов получим при следующих значениях параметров C_{p2}=2300м/с C_{s2}=1311 м/с C_{p1}=5400м/с C_{s1}=3196 м/с;
$$\nu_2 = 0.35; \nu_1 = 0.3;$$
$$\rho_2 = 0,126 кг.\, с^2/м^4, \rho_1 = 0,283 кг.\, с^2/м^4.$$

Результаты расчетов на ЭВМ приведены на рис.2.4 при C<C$_{s1}$.

В этом случае безразмерные фазовые скорости $\chi = C/C_{p2}$ является действительными и $\chi = f(C/\lambda)$. Численное результаты получены при различных значениях n. Из результатов видно, что с увеличением n фазовые скорости пропорционально увеличиваются. В дальнейшем $L/\lambda \to \infty$, фазовые скорости не изменяются, т.е. почти не изменяется в зависимости от длины волн.

Во втором случае рассмотрим следующее соотношение параметров $\rho_0 < 1; \overline{C_p} < 1; \overline{C_S} < 1;$ т.е. C_{p2}=5400 м/с; C_{s2}=3195м/с; C_{p1}=2300м/с; C_{s1}=1311м/с; $\nu_2 = 0.3; \nu_1 = 0.35; \rho_2 = 0,283 кг.\, м^{-4}/сек^2, \rho_1 = 0,126 кг.\, м^{-4}/сек^2$ или $\rho_0 = 0,4452; \overline{C_p} = 0,4259; \overline{C_S} = 0,4203.$

Из полученых результатов вытекает, что фазовые скорости станут мнимыми.

В качестве тестовых задач рассмотрим распространение продольных волн в упругой полосе с свободными краями. При этом будем исходить из дифференциальных уравнений движения линейной теории упругости для плоской задачи в состоянии поверхностного напряжения. Выводится частотное уравнение для продольных синусоидальных волн в напряженной полосе стенки со свободными краями

$$\frac{tg\frac{Sl}{2}}{tg\frac{ql}{2}} = \frac{4\pi^2\frac{e^2}{\lambda^2}\frac{ql}{2}\frac{sl}{2}}{\left[\pi^2\frac{l^2}{\lambda^2} + (\frac{sl}{2})^2\right]^2},$$

где

$$\frac{sl}{2} = \pi\frac{l}{\lambda}\sqrt{1 - \frac{c^2}{c_2^2}}; \quad \frac{ql}{2} = \pi\frac{l}{\lambda}\sqrt{1 - \frac{c^2}{c_l^2}}$$
$$c_2 = \sqrt{\in/(s(l - \gamma^2))}; \quad c_2 = \sqrt{G/s};$$
$$q = f\sqrt{1 - c^2/c_l^2}; S = f\sqrt{1 - c^2/c_2^2},$$

f – волновые число. Вычисляются дисперсионные кривые фазовых скоростей. Результаты расчетов которых приведены в таблице 1(ν = 0,29).

Найдено, что фазовой скоростью для коротких волн является немонотонная функция длины волн. Для L/λ>0.5 фазовые скорости монотонно убывают и приближаются к асимптоте. Из численных результатов вытекает, что распространение волн напряжения трехслойном

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теле осуществляется при высших частотах, как в свободном слое.   Установлено, что при L/λ=0.5 первые моды фазовой скорости в зависимости от L/λ изменялись монотонно возрастая. Во втором случае фазовые скорости различных мод сопровождались сильными затуханиями.

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THE ROLE OF THE PRINCIPLES OF SYMMETRY IN THE FORMATION OF THE GENERAL THEORETICAL FOUNDATION OF SCIENTIFIC KNOWLEDGE AND SCIENTIFIC WORLDVIEW

Abstract: *The article shows the special importance in the worldview of the components of scientific knowledge (concepts, principles, laws, theories), which in themselves are generalized in nature and more than others perform the function of generalizing different kinds of knowledge. The historical and methodological analysis of the principle of symmetry is carried out on the material of physical science and the role of the idea of symmetry in the formation of the general theoretical foundation of scientific knowledge and scientific worldview, the philosophical and methodological substantiation of the meaning of general scientific concepts and mediating the connection of worldview and private scientific knowledge.*

Key words: *worldviews, unified worldview, concept, categories, knowledge, harmony, symmetry, asymmetry, dissymmetry, scientific cognition.*

Language: *Russian*

РОЛЬ ПРИНЦИПЫ СИММЕТРИИ В ФОРМИРОВАНИИ ОБЩЕТЕОРЕТИЧЕСКИЙ ФУНДАМЕНТ НАУЧНОГО ПОЗНАНИЯ И НАУЧНОГО МИРОВОЗЗРЕНИЯ

Аннотация: *В статье показано особое значение в мировоззренческом плане компоненты научного знания (понятия, принципы, законы, теории), которые уже сами по себе носят обобщенный характер и более других выполняют функцию обобщения разно порядковых знаний. Осуществляется историко-методологический анализ принципа симметрии на материале физической науки и роль идеи симметрии в формировании общетеоретический фундамент научного познания и научного мировоззрения, философско-*

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методологический обоснован значения общенаучных понятий и опосредующих связь мировоззрения и частно-научного знания.

Ключевые слова: мировоззрения, единой картины мира, понятии, категории, знания, гармония, симметрия, асимметрия, диссимметрия, научного познания.

Введение

В современную бурно развивающим научно-технологическом процессы отмечается повышение социальной активности масс и вовлечение все большего числа людей в процесс преобразования мира – как в сфере социальных институтов, так и в материально-производственной структуре. Возрастание роли отдельного человека во всех сферах, жизни общества в первую очередь связано возрастанием творческого характера его деятельности и его мировоззрением. Мировоззрение человека становится фактором, от которого в значительной мере зависят характер и темпы общественного развития.

Объектом мировоззрения, как и всех других форм человеческого познания, является реальный мир, но мировоззрение выделяет из этого объекта свой, только ему присущий предмет: отношение человека к миру в целом. Становление мировоззрение человека происходит с момента его рождения и служит способом обобщенного осознания человеком своего отношения к окружающей действительности, определения места в мире, осознания цели и смысла своей жизни и деятельности. По этому, мировоззрение является важным компонентом структуры личности и формируется под влиянием большого числа факторов практически на протяжении всей жизни человека. Все представления, понятия, знания, взгляды, которые непосредственно выполняют эту функцию, являются мировоззренческими.

Мировоззрения - это система обобщённых взглядов, представлений о мире и его закономерностях, об окружающих человека явлениях природы и общества. По своему содержание и направленности целостной мировоззрения может быть философский, научные, мифологические, религиозные. Следует сказать, что при анализе любого типа мировоззрения характеристика его взаимоотношения с научным знанием имеет большое значение, поскольку именно этим определяется степень научности, обоснованности каждой из возможных разновидностей мировоззрения. Каждый из отмеченных элементов – необходимая составная часть мировоззрения, отсутствие одного из них изменяет всю структуру мировоззрения как целостного феномена.

Но, из них именно научное мировоззрение есть интегральное видение и осмысление мира, оно является высшим синтезом всех знаний, опыта, убеждений, идеалов и эмоциональных оценок. Образуется на основе естественнонаучных, социально-исторических, технических и философских знаний, включая определенная идеология; его носитель – личность и социальная группа, воспринимающие действительность сквозь призму определение[1, с.26].

Высшая степень единства знания и его систематизация связана с участием общенаучных средств, и прежде всего философии, в формирования научной картины мира, а следовательно, имеется основание для широкого участия общенаучных понятий в формировании научного мировоззрения. Все понятий нашего познания могут быть разделены на философские, общенаучные и частно-научные [2]. К первым относятся, например, материя, сознание, пространство, время, движение, причинность и т. д.; ко вторым – множество, информация; к третьим, например в физике – импульс, частица, волна, заряд, масса и др.

В связи с чем триада (философское – общенаучное – частно-научное знание), как представляется, даст наглядный образец различных уровней мировоззрения в их; диалектическом единстве: философский, общенаучный, частно-научный. В этом спектре мировоззренческих актуализаций расширяется горизонт личности в ее духовном и практическом самоопределении.

Роль общенаучный понятии в формировании общетеоретический фундамент научного познания и научного мировоззрения

Диалектический характер познания органически присущ объективному знанию о действительности и составляет непременное условие процесса формирования общетеоретический фундамент научного познания и научного мировоззрения, поскольку диалектика вещей, объективная диалектика мира раскрывается через диалектику понятий. Наиболее широкие по объему и особо важные по своему значению для развития теории и практики фундаментальные понятия, как известно, называют термином "категория". Мы имеем в виду те новые методы, понятия в специальных науках, которые приобретают новый статус (общенаучность) на основе взаимодействия с философскими средствами познания.

Общенаучные понятия образуют специфически-интегративный по характеру общности уровень концептуального отражения действительности. Им присущи некоторые

свойства, характерные как для философских категорий, так и для частно-научных понятий, что определяет место и роль общенаучных понятий в системе научного знания. Категории нашего познания являются всеобщими (философскими) тогда, когда они отражают атрибуты материи и их взаимосвязи, участвуют в решении основного вопроса философии. Поскольку каждый атрибут материи имеет всеобщие и специфические признаки, категории, отражающие всеобщие признаки атрибутов, имеет тоже всеобщий характер.

Мы отмечаем, что между философскими и общенаучными уровнями познания нет четкого разграничения, поэтому можно предположить, что в системе неустойчивости познавательной парадигмы понятия из общенаучных переходят в категориальный аппарат философии. При этом расширяется диалектика частных наук (И.Т. Фролов) и обогащается категориальный аппарат философии. В теоретических положениях философии существует необходимость в конкретизации исходных положений, уточнении в применении онтологических и гносеологических дискурсах новых смыслов категориального аппарата, который после рефлексии вторичного познания эксплицируется и редуцируется в обновленном содержании философских категорий[3, с.30]. Таким образом, новые философские (всеобщие) категории не вводятся в наше познание по произволу ученых, а открываются в процессе расширения поля знания, являются обобщением того нового, что дают наука и практика.

Основной особенность мировоззрения заключается в том, что и переоформленные таким образом элементы научных знаний (например, категории) входят в мировоззрение не разобщенно, не каждый сам по себе, параллельно с другими, а в интегрированном виде, как частичка единого сплава мировосприятия в целом. Поэтому особое значение в мировоззренческом плане имеют те компоненты научного знания (понятия, принципы, законы, теории, дисциплины и целые отрасли науки), которые уже сами по себе носят обобщенный характер и более других выполняют функцию обобщения разно порядковых знаний, их переосмысления под каким-то общим углом зрения в единое целое.

Перечисленные критерии всеобщности категорий нашего познания не являются исчерпывающими, ибо они сами зависят от развития познания и практики. Но ими вполне можно руководствоваться при решении вопроса о том, обладают ли категории симметрии и асимметрии всеобщим (философским) значением, являются ли они или не являются категориями теории познания?

Общетеоретический и мировоззренческий аспекты категории симметрии

У истоков знаний находятся устойчивые категории, формирующие общетеоретический фундамент научного познания, научного мировоззрения и мироустройстве в процессе исторического развития философских и научных представлений.

Однако, сегодня, когда различные области знаний стремятся к интеграции, мы вновь возвращаемся к понятию (категорию) симметрии, как явлению, присущему самым различным областям знаний, объединяющим в себе самые разнообразные явления действительности.

Симметрия применяется практически во всех сферах научной деятельности, включая философское направление, при этом, в независимости от направления исследования, сохраняется внутренний смысл и содержание применяемого базового понятия. В связи с этим, полагаем, можно определить интегративное свойство феномена симметрии в общефилософском и методологическом аспектах как синтез культурных форм и явлений, направленный функционально для выявления новых элементов знания. Сложившийся категориальный аппарат в философии является методологической основой для саморазвития и самопознания, а для прикладных методологий он формирует общетеоретический фундамент научного познания и научного мировоззрения. Именно поэтому понятие симметрия становится одним из составляющих философской саморефлексии в системе современных научных исследований. История «симметрии» неотделима от всей истории науки, так как именно в них на основе методологических принципов отражается система научного познания и закономерности его развития.

В силу того, что современная физика играет существенную роль в формировании общетеоретический фундамент научного познания и научного мировоззрения, исходных требований к исследовательской деятельности и выработке норм научного мышления. Для нашего времени характерно быстрое, мощное и весьма плодотворное проникновение физических понятий и методов во все или почти все отрасли науки. Химик, объясняющий ход реакций движением и структурой ядер, дислокацией и передислокацией нуклонов и электронов в атомах и атомов в молекулах; геолог, видящий зависимость процессов, происходящих в земной коре, от распада ядер; астроном, апеллирующий к общей теории относительности и к ядерным процессам, чтобы раскрыть закономерности эволюции звезд и галактик; биолог, находящий разгадку наследственности и ее нарушений в строении и изменении строения больших молекул

и ссылающийся при этом на квантовую механику; инженер, строящий цехи новейших, основанных на новый инновационных принципах предприятий; экономист, учитывающий народнохозяйственных прогнозах конкретизацию и применение современные, квантовых и релятивистских принципов, - такой список можно было бы продолжать сколь угодно долго. Современная наука не имеет абсолютных границ для миграции физических понятий. Физика играет важную роль в жизни общества, оказывает влияние на развитие техники и технологии; в то же время собственное развитие физики находится в прямой зависимости от потребностей общественного производства, уровня развития инновационной технологии и мировоззрения ее созидателей. Известный американский физик Ю. Швингер писал: «Уровень науки в любое время характеризуется отношением к фундаментальным свойствам материи. Мировоззрения физика определяет уровень техники и культуру общества и указывает путь к дальнейшему прогрессу»[4, с. 11-12]. По этому, историко-методологический анализ принципа симметрии осуществляется в нашем исследовании, прежде всего, на материале физической науки.

В научном мировоззрение должны господствовать внутри научные идеалы, из внешнего же мировоззрения могут привлекаться только содержательные картины (онтологические учения) и философские теории познания. Идея симметрии в развитии физики определила путь к идеалу единой картины мира, так как изначальные смыслы понятия симметрии соответствуют законам физического мира, для которого характерны: порядок, гармония, ритм, сходство, подобие, соразмерность, согласование частей в целостной структуре. Есть все основания рассматривать понятие симметрии и асимметрии уже не только как понятие естествознания, техники, архитектуры и теории искусства, психологии, педагогики, политологии, социологии, но и как всеобщее (философское), потому что проявление симметрии и их формы выражает взаимосвязь целостной структуры познаваемой материи и принимается в качестве обсуждения основного вопроса философии. Об этом очень удачно написал Дж. Ньюмен: «Симметрия устанавливает забавное и удивительное сродство между предметами, явлениями и творениями, внешне казалось бы, ничем не связанными: земным магнетизмом, женской вуалью, поляризованным светом, естественном отбором, теорией групп, инвариантами и преобразованиями, рабочими привычками пчел в улье, строением пространства, рисунками ваз, квантовой механикой, лепестками цветов, интерференционной картиной рентгеновских лучей, делением клеток,

равновесными конфигурациями кристаллов, снежинками, музыкой, теория относительности…»[5, –с. 48.]

Философско-методологическое осмысление становления и развития принципа симметрии в контексте развития науки, философии и в целом всей духовной культуры, выявление его роли в эволюции научных представлений, формировании научных теорий, синтезе научных знаний имеет первостепенное значение [6, – с. 10].

Философско-методологический анализ принципа симметрии

Как справедливо отмечают В.И. Вернадский (1863 - 1945), в своей рукописи «Химическое строение биосферы Земли и ее окружение», А.В. Шубников (1887 - 1970) в предисловии к своей книги «Симметрия», чувство симметрии и стремление его выразить в быту и жизни человека существовало еще в палеолите или даже с эолита, т.е. с самых длительных периодов в доистории человечества, что подтверждается многочисленными археологическими памятниками древности. Археологические памятники и отдельные объекты глубокой древности мира, при особом методологическом подходе дают достаточно точные указания о формировании в первобытном обществе зачатков наук и указывают на довольно высокую духовную культуру того времени. Памятники, найденные в самых различных территориях мира, содержат симметричные фигуры и рисунки, которые поражают своим удивительным сходством, что показывают на независимость возникновения зачатков понятия симметрии в различных точках земли, в том числе и в Средней Азии[7, с. 176-180].

Первоначально на интуитивном, мифологическим уровне, а затем на научном восприятии мира человеку удалось определить существенные, необходимые законы адаптации к сложному, изменяющему миру. В динамически меняющемся мире он отыскивал инварианты, которые помогали ему познавать мир. Сложный, нерегулярный, хаотический мир в древнегреческой философии редуцировался к двум концепциям: Элеатская – неизменность (симметричность) бытия и гераклитовская – непрерывного (асимметричное) изменения.

В эпоху античности идея симметрии применялась в создании космологических систем Вселенной, на основе центрально-симметричных пропорций. Пифагорейцы создали учение о пропорциях, понятие симметрии стало основой в теории музыкальных тонов и пяти симметричных многоголосиях, представляющих в натурфилософских учениях и космологической картине мира природные стихии.

Древнегреческие философы создали учение о вечном космосе, так Анаксимандр, Анаксимен и

Гераклит описали возникновение и умирание по закону симметрии. Гераклит верил в упорядочивающую силу энергии (логос), которая гармонизирует нерегулярные взаимодействия и создает упорядоченное состояние материи. Это была попытка показать, как из сложного, нерегулярного и хаотического состояния материи рождается порядок. Также Левкипп и Демокрит опираясь на идею симметрии и гармонии, сохранения материи, доказали теорию пустоты в вечных и неизменных, но движущихся атомах. Их вклад составили три компонента: создание идеалов и норм науки; изобретение процедур теоретического мышления; выдвижение трех научно-мировоззренческих программ: математизация естественных наук (Пифагор, Платон), поиск глубинных элементов природы (атомы и т. п.), идея связи эмпирии и теории (Аристотель).

В многочисленных источниках написано об исчезновении идеи симметрии в эпоху средневековья и возрожденную в эпоху Ренессанса. Но, в исламской культуре бесконечное многообразие и красота сотворенного Аллахом мира воплощались в каллиграфии и орнаментах, украшающих мечети, минареты, порталы и стены величественных зданий. Абстрактных геометрических узоры, запечатленные в средневековых гирихах, отражают новые подходы и показывают ограниченность эвклидовой геометрии. По этому, в восточной средневековой геометрии, и астрономии, и арифметике, и науке о музыке, наконец и медицине – учение о симметрии, гармонии позволило исследовать многие традиционные проблемы этих наук с новых позиций, в свете новых концептуальных подходов отличных от греческой, античной науки.

Вместе с тем, мыслители ранним средневековой исламской культуры (ал-Кинди, аль-Фараби, аль-Бируни, Ибн-Сина и др.), определяя гармонию как важнейший элемент в мировоззрения и деятельности человека, подчеркивали, что дисгармония – необходимый элемент гармонии целого. Так, аль-Кинди пишет «гармония имеет место во всем и очевиднее всего она обнаруживается в звуках, в строении Вселенной и в человеческих душах»[8, – с. 49]. Идею гармонии и дисгармонии аль-Фараби развивал относительно нравственных качеств человека, что нашло отражение в работе «Афоризмы государственного деятеля». Совершенство в искусстве аль-Фараби связывает с красотой и пользой. «Красота, великолепие и украшение всякого бытия состоит в том, чтобы осуществить свое бытие наилучшим образом и достичь его полного совершенства»[9, –с. 221].

Аль-Бируни научно доказал идею о том, что живую природу можно отразить в геометрических формах, в определенных структурных объектах. На примере некоторых растений - сумел показать, что наряду с классической формой симметрии существует иная - эдрическая симметрия, т.е. запрещенная теорией кристаллографии 5-ая поворотная симметрия существует. Она характерна для некоторых цветов плодово-ягодных растений, для цветов плодовых растений и т. д.[10, – с. 239].

Ибн Сина утверждает, что природа по сравнению с человеком гармонично сама по себе. Он дает антропологическое истолкование гармонии, стремится найти ее принципы в устройстве человеческого организма и в духовном облике человека. Он не стремился устанавливать связь между состоянием неба, свойствами души и музыкальными интервалами, как это делали пифагорейцы. Он критиковал пифагорейцев за то, что в учении они не «отличают одну науку от другой»[11, -p.26].

В эстетике понятие симметрии традиционно ассоциируется с гармонией, красотой, порядком. По этому, проблема прекрасного является у Ибн Сины основной эстетической категорией. Она включает в себя виды проявления таких категорий, как «гармония», «совершенство», «ритм», «мера». Музыкальный ритм, чувство такта, породил имеющийся в человеке пульс крови. «Как искусство музыки, - пишет Ибн Сина, - совершено благодаря сочетанию звуков в известном соотношении по остроте и тяжести и кругом ритма, величине промежутков времени, разделяющих удары по струнам, таково и качество ударов пульса. … Так же, как темпы, ритм и достоинство звуков бывают согласные, а бывают и несогласные, так и неровности пульса бывают упорядоченные, а бывают и неупорядоченные»[12, –p. 17]. Можно логично предположить, что время, взаимосвязанное со скоростью ритмизированного деления, субъективно для каждой становящейся системы, что позволяет говорит о нарушенной симметрии между временными потоками. И, по этому, Ибн Сина говорит и о наличии биологических ритмов в теле, тканях, органах, о том, что они тесно связаны с ритмикой среды, учить читать взаимодействия этих ритмов через пульс, ощущать в них единую закономерность, некую музыку, что можно смело отнести к наивысшим достижениям медицинской мысли. А это уже биофизика, которую как широко изучают в современной терапии: синусовая аритмия сердца, например, Ибн Сина различая 48 видов пульса по десяти параметрам[13, с.155-158].

Мир, согласно Ибн Сине, был сотворен не сразу и не весь непосредственно Богом. Бог является единым, а из единого могут произойти только единое. Любая множественность может быть лишь результатом дальнейших актов

творения. Проводя противопоставление восточного понимания Бытия и его понимания в метафизике, следует отметить, что Бог для Ибн Сины – это абсолютная реальность, бесконечная реальность, он источник любых видов бытия, из него исходят экзистенция и трансценденция. Поэтому многие современные иранские философы Ибн Сину считают "первом философом бытия", приходя к утверждению, что по сути развитие всей онтологии на Западе является "комментарием или сноской" на Ибн Сину. Таким образом, Ибн Сина не только придал аристотелевской философии конкретную направленность, но и своими трудами актуализировал проблемы, связанные с диалогом науки и религии. Это достижение оказало значительное влияние на развитие средиземноморской и европейской философии.

Далее, позднее средневековое европейский естествознания основывалось на догматизированных религией Аристотеля и метафизики исламский цивилизации. Концепция однородного изотропного, бесконечного пространства получила научное обоснование в трудах Н. Кузанского. Представление об однородности времени мы находим в записках у Леонардо да Винчи. Н. Коперник применяет идею симметрии в развитии классической механики и создает концепцию пространственно-временной симметрии. Бесконечность однородного изотропного пространства обоснована в трудах Дж. Бруно. Новой физики требовалось программа математизация и атомизм. Эту смени идеалов и идей осуществили с новым мировоззрением Г. Галилей, И. Кеплер, Р. Декарт и Х. Гюйгенс создали и продолжали идею о пространственно-временной симметрии. Вслед за ними особый вариант религиозной метафизики разработал И. Ньютон и на ней построил основы классической физики, применил ее в "Началах" как фундаментальную основу. В её завершении важную роль сыграла философские дискуссии между атомизмом и махизмом, энергетизмом и атомизмом.

В середине XIX в. наука обращается к принципам симметрии и сохранения как базовой основе законов физики. Так, закон сохранения и превращения энергии открывает Р. Майер. Идею симметрии в концепции симметрии электрических и магнитных полей применил П. Кюри вне рамок физики кристаллов. Универсальный принцип, сформулированный П. Кюри, состоял в том, что форма тела сохраняет только то элементы собственной симметрии, которые совпадают с накладываемыми на него элементами симметрии внешней среды.

Теория относительности продолжилась в создании общей теории относительности, релятивизации физических теорий, в опытной разработке единой теории поля, создании релятивистской космологии. Труды А. Эйнштейна, В. де Ситтера, А.А. Фридмана стали классическими в развитии физического познания. Взаимосвязь принципа симметрии и принципа сохранения была выявлена А.Э. Нётер. Таким образом неклассическая физика резко повысила уровень научного мировоззрения. СТО указала на связь объекта с системой отсчёта наблюдателя и его приборами. Квантовая механика дала вывод о единстве объекта с активности учёного, она актуализировала принцип единства противоположности: прирывное-непрырывное, элементарное-сложное, случайное-необходимое. Синергетика выявила взаимосвязь беспорядка с порядком. Источником этих идей стали восточное мировоззрение и христианская метафизика.

В.И. Вернадский предпринимает в 20-х годах текущего столетия серию работ, где продолжает развивать идею симметрии в применении научного познания и формирования научного мировоззрении для широкого использования, признавая симметрию как «основной принцип понимания сущего» [14, – с.22]. Принцип симметрии в настоящее время стал тем концептуальным средством, через которое обеспечивается единство законов квантового поведения материи и построение фундаментальной квантовой теории, открывающей глубинное смысловое единство всей природы. «Понятие симметрия в ХХ веке выступает как один из важнейших и глубоко разработанных методологических принципов построения научной теории»[15, с.5]. К.Л. Вольф и Р.Вольф, В.С. Готт выделяют однообразие как характерную черту симметрии, при этом понятие симметрии ассоциируется с порядком, пропорциональностью, устойчивостью, равновесием, соразмерностью. Однородность для характеристики симметрии определял Н.П. Депенчук. Равномерность как особенность симметрии выделял В.И. Свидерский. Понятие равенства в симметрии рассматривал А.В. Шубников[16, – с. 158-159]. И многие другие продолжают отождествление симметрии с указанными свойствами ее бытности…

В исследовании симметрии необходимо рассмотреть понятие асимметрии как отражение граней философского осмысления. В асимметрических объектах отсутствуют элементы симметрии, и, наоборот, в симметрических объектах нет элементов асимметрии. Значит, асимметрия представляет из себя философскую категорию, противоположную симметрии, в которой отражаются нарушения равновесия, в связи с изменениями системных объектов, их развитием, когда идет процесс перестройки либо целостного объекта, либо его частей. Абсолютно

чистых симметрии и асимметрии не существует, в системе неустойчивости бытия постоянно продолжается процесс непрерывной борьбы в единстве целого.

Сущность симметрии заключается в ее устойчивости общих свойств целостной структуры, принадлежащих разным объектам, явлениям, процессам. Асимметрия в отличие от симметрии выражает индивидуальную сущность структурных элементов, частей, явлений и т.д. В процессе изучения асимметрии мы приходим к выводу о необходимости ее применения в анализе категориальной сущности симметрии, ее онтологических и гносеологических аспектах. В связи с этим, симметрия признается как общее объективное осознание реальной действительности, а асимметрия как частное индивидуальное в реальности познания. «Во второй половине ХХ столетия особенно в связи с попытками построения теорий фундаментальных физических взаимодействий ситуация начала радикально меняться. Суть изменяющейся методологии физического познания состояла в том, чтобы за точными симметриями искать их нарушения в силу того, что нарушенные симметрии в свой основе также отражают глубинные закономерности нашего мира» [17, – с. 122].

Исследование соотношений понятий симметрии и асимметрии, взаимодействие элементов и структурных единиц в методологии особенно ценно в связи с тем, что оно наглядно демонстрирует взаимосвязи и взаимозависимости философских парных категорий. Таких, как: «устойчивость - изменчивость», «структура - элемент», «часть и целое», «причина и следствия», и т. д. Из этого можно сделать вывод, что симметрия и асимметрия относятся к фундаментальным принципам мироустройства и являются как общенаучными, так и философскими категориями.

Между симметрией и ее отрицанием – асимметрией, есть важное понятие – диссимметрия. Диссимметрия – внутренняя, или расстроенная симметрия, т.е. закономерное нарушение симметрии, частичное отсутствие у объекта некоторых элементов симметрии, которые ярко выражены у одних и отсутствуют у других, обладающих свойствами объекта. Впервые Л. Пастер вводит в научный оборот понятие «диссимметрия», объясняя это тем, что «…свойства определенных фигур не совмещается простым наложением со своим зеркальным изображением»[18, –с.383]. П.Кюри, продолжая теорию Л. Пастера в логике своих научных изысканий о влиянии окружающей среды на находящиеся в ней тела, определил, что «…у них сохраняются преимущественно те элементы собственной симметрии, которые совпадают с симметрии среды»[19, – с. 101]. Пьер Кюри выяснил, что именно отсутствующие элементы симметрии допускают развитие системы в отличие от присутствующих элементов симметрии, которые фиксируют ее статус и ограничивают свободу развития. Его знаменитая фраза: "диссимметрия творит явление". Диссимметрия является двигателем прогресса в гармоничном человеческом сообществе. Согласно принципу диалектического единства симметрии и диссимметрии, всякому живому и неживому объекту присуща та или иная форма этого единства.

В.С. Готт, Ю.А. Урманцев, Н.Ф. Овчинников, А.Г. Спиркин и другие в своих трудах понятия симметрии и асимметрии рассматривают с философской позиции осмысления процессов их соотношения. Вследствие полученных данных мы можем сделать вывод о том, что в исследуемых понятиях отражаются всеобщие свойства материи, и именно поэтому они обретают статус философских категорий. Симметрия как категория мышления является ведущей по отношению к асимметрии и спонтанно нарушенной симметрии. Спонтанно нарушенные симметрии фиксируют взаимосвязь между различными типами симметрии, характерными для разных типов физических взаимодействий, а также для социальных отношений; одновременно представленные типы включают в себя и явления асимметрии, что конкретизирует характер их отношений, заключающихся в переходе от первого (через диссимметрию) ко второму. Фиксация такого перехода указывает, в том числе и на неразрывное диалектическое единство симметрии и асимметрии, которое имеет значение методологического принципа.

Философское познание формирует категориальный аппарат на базе всеобщих понятий, создающих и отражающих атрибуты материи, их взаимосвязи и взаимодействия. В подтверждение мы приводим тезис В.С. Готта, который пишет – «Категория симметрии и асимметрии, на наш взгляд, вполне удовлетворяет этим требованиям» [20, – с. 301].

Формулированные с помощью идей симметрии научного мировоззрения выполняют следующих задач: 1) формулирование мировоззренческих проблем науки, 2) выдвижение мировоззренческих идей, 3) рефлексия неявных теоретических методов науки, 4) создание идеалов науки и их пересмотр, 5) оценка и обоснование новых научных теорий.

Заключение
Как видим, в иерархической системе уровней физического познания принцип симметрии представляет собой более общую конструкцию, чем закона. Эта функция "управления" законами

была раскрыта в история физики теоремой Эмми Нетер, согласно которой с каждой физической теорией можно связать некоторую фундаментальную группу симметрии. Психологическая ценность идеи симметрии объясняется тем, что «чувство симметрии и стремление его выразить в быту и жизни человека существовало еще в палеолите или даже с эолита, т.е. с самых длительных периодов в доистории человечества, что подтверждается многочисленными археологическими памятниками древности»[7, с.178].

На принципы симметрии в математике, искусстве и архитектуре обращали внимание с древнейших времен, однако в естествознание, особенно в физику, они вошли сравнительно недавно, а глубокому теоретическому и философскому осмыслению были подвергнуты лишь в прошедшим столетии, когда была осознана их тесная связь с принципами сохранения. Последние же вошли в философию и физику значительно раньше и являлись основополагающими принципами философского мировоззрения еще со времени античных атомистов.

Симметрия является фундаментальным методологическим принципом научного и, особенно, физического познания, понятийной формой философского способа мышления. Методологическая роль этого принципа заключается в следующем. В физике существует три уровня описания: явления, законы и принципы симметрии. Полное знание явлений сделало бы ненужным законы природы, служащие корреляциями между явлениями, но и все законы природы нам неизвестны. Принципы симметрии позволяют открывать новые законы и в этом смысле являются корреляциями между законами. Значить можно говорить, что, если законы управляют явлениями, то принцип симметрии управляет законами.

Как мы выяснили, понятие симметрии приобрело категориальный статус философского познания и научного мировоззрения на основе исторического развития научного знания и приобрело общенаучное применение в разных областях исследовательского интереса в контексте онтологического и гносеологического ракурсов осмысления процессов и динамики взаимодействия, связанной с уточнением и конкретизацией применения. Вследствие проведенного анализа мы можем констатировать развитие и применение категории «симметрии» практически во всех отраслях научного знания в том числе в формированию научного мировоззрения человека.

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TERRORISM AND TERRORISM IN THE CONTEXT OF A SYSTEMIC AND HISTORICAL APPROACH

Abstract: In the article, the authors considered the specificsterrorism, which is complicated by the resilience of its reproduction. So it was, when the terrorist fight was represented only by terror, it is also observed now. Terrorism is reborn in terrorism, and the world community in the forefront, on the one hand, activates counter-terrorist activities, on the other hand, - reproduces the object of its struggle. The scientific and philosophical problems of increasing the effectiveness of policies aimed at eradicating all forms of terrorist struggle are considered.
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Introduction

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The subject of special interest in the scientific and philosophical knowledge of terror, apparently, was made after the Great French Bourgeois Revolution of 1790-1793, in which he was destined to become part of his struggle. That the "revolutionary terror" of the Jacobins and Girondists in their own right was not an actual terror, but the manifestation of

one of the two signs that define its qualitative identity, went to the second plan. Robespierre political scientists, historians, lawyers believed in the word.

Robespierre's lawyer was neither a scholar nor a philosopher, he thought, spoke and wrote, as he demanded a practical participation in the revolutionary movement. Robespierre's definitions had a situational prediction and did not claim the status of a scientific association or philosophical systemic reflection. The French politician thought so and for him it was decisive. Therefore, the scholars in their research were formed in a general line with Robespierre, not taking into account the necessary epistemological and methodological procedures - the question, which is relevant and in the first quarter of the XXI century. Robespierre unknowingly directed a scientific analysis of terror in the detour, giving recognition of the signs of a detective story.

The scientific understanding has been complicated by the consequences of two conditions - the development of terrorism in terrorism and the multi-social nature of the political essence of the terrorist struggle.

Terrorist struggle is a combination of practical actions directed against the state and its policies with the aim of transforming the established socio-cultural architecture, and therefore counter-terrorist activity is also important. But the arguments for the effectiveness of the fight with terrorists are not developed in the most practical part of it, they are not subject to scientific and philosophical support. The basis of the success of the counter-Christian struggle is laid by science and philosophy. And "here" should not be so divided into scientific and philosophical studies, to emphasize the importance of their interaction.

The specifics of scientific cognition should not be understood as contradicting the general theories of cognition of the world - philosophical studies of cognitive activity, and as the concretization of universal achievements of epistemological concepts, applications and applications. The peculiarities of cognition in science are indisputable, it is important not to absolutize them. In science and philosophy, a common object of knowledge and a single goal of knowledge, they strive to understand that in the world that its nature is hopefully hidden behind external manifestations. Mirror reflection also seems simple and clear, but it was worth doubting in this outward simplicity and was born optics like a weight in a difficult section of physics. To I. Newton and the light just looked: what in him? And in its simplicity it was called "white". Unusual about the origin of Belize.

The main part

In the nature of light, sufficiently well studied in science and widely used in practice, it is possible to show the inevitability of combinations in the promotion of the subject of knowledge - the

acquisition of the original knowledge. He did not want to immerse himself in the epistemological and methodological past, in the experience of scientific separatism, when there were many attempts to oppose the primacy of scientific knowledge. Philosophers acted against philosophy and did not manage to understand philosophical knowledge, and ultimately determined the quality of philosophical knowledge by impossibility to verify its authenticity with scientific procedures. Experience as an instrument of cognition has taken on an empirical form, which in itself was a testimony to the philosophical nearness.

Methodologically, scientific and philosophical cognition really look different. The first is focused on the quality of "private" and formally able to move to the side of "general" issues. Second, on the contrary, strives to look in general as the material for the construction of universal architecture of the world. The problem of relations of individual (single) and general relations has a history of decisions for several thousand years. It was persistently practiced in the Middle Ages of scholasticism, but it was not agreed that it looked natural, that the process of deception of "nominalists" and "realists" began. In the light of formal logic, they divided the reality of the existence of "private" and "general", absolutizing them in opposition.

G. Hegel was able to show the methodological flaw of the previous interpretation of "private" and "general", representing them as concepts that reflect a single nature of existence, dividing only by the way of manifestation of reality and conditioned by the appearance of an impersonation. There is an important postulate of the theory of knowledge about the interaction of general and individual, philosophical and scientific approaches. The object of general knowledge is the nature of movement, and the subjects differ, making the need for interaction.

Without combining the understanding of philosophical understanding of the process with scientific success will always be limited, especially in those cases, when the speech goes on the definition of basic concepts. The philosophical approach helps to overcome empiricism of scientific reasoning and to include scientific interpretation in the structure of the systematic approach to the object of cognition. All system-forming scientific concepts must undergo philosophical examination.

Commenting on the fruitful ideas of G. Hegel, VI Lenin wrote under the sign NB: "The usual representation captures the difference and contradiction, but not the transition from one to the other, and this is the most important… expresses the concept of things and their attitudes. The thinking mind (mind) sharpens the muted distinction of distinction, simple diversity of representations, before the essential distinction, to the opposite. Only raised at the top of the contradiction, diversity becomes mobile (regsam) and live in relation to one to another,

- acquire that negativity, which is the internal pulsation of self-movement and life. 128].

If in the methodological aspect the scientific and philosophical cognition look as contradictory, then in the epistemological context they belong to the general series. Cognition in science and philosophy exists in a specific form of concepts. Among the main reasons for cognitive defects of scientific cognition in the first place there is a lack of understanding of thinking. Instead of concepts, general representations are used, with which the polymerism of interpretation of the content of key forms of knowledge is used.

There are hundreds of definitions of terror and terrorism in terrology - this is not a definition of concepts. We have reviewed the main array of publications of terrorists and none of them have found a logical beginning in the definition of science - the analysis of forms of knowledge. Declares the fact of the existence of a certain set of concepts without justification and separation of the original signs of the concept. The concept is a form of knowledge that reflects the essence of the phenomenon, so the dependence on its definition, summing up the basic concepts of the concept, is the quality of knowledge about the object and its subject specification.

Consciousness of terrorists in the best case depends on the formal-logical characteristics of the concept. Подобное знание Г. Hegel called the corresponding rational logic: "In the rational logic the concept is considered usually only as a simple form of thinking and, more precisely, as a general representation" [1, p.341]. Г. Hegel did not identify the concept with the general representation. With a general representation he compared the specifics of the concept present in Aristotelian logic. It is in this concept is determined as nothing identical to itself forever, "nothing dead, empty and abstract" [1, p. 341].

Reasonable interpretation of the concept, built into its identical reality, convenient as a support point of vision. Each concept has its place on the "shelf" forever, but it does not contain a lethal deficit, - it does not deny the occurrence of changes in the validity of the change, turning into a period of time in history. According to G. Hegel, the rational definitions of the concept of "the final definitions." Reasonable understanding as an instrument of discourse within the framework of strictly limited conditions, in essence, preparatory action to the real meaning of cognition, G. Hegel contradicted the concept formed by the logic of speculative (dialectical) thinking:

1. the moment of universality, as a free kinship with itself in its determination;

2. the moment of specificity, determination, in which the whole remains indistinguishable equally to itself;

3. The moment of unity as a reflection - in the very definition of universality and specificity, the negative unity with itself "[1, p. 345].

The concept differs from the general representation of universality. Systemic traces of its content must exclude the inexplicable in the essence of the definition, reflecting the nature of the object, and the high potential of development, concluded in it, the knowledge of the essence, which guarantees the expected passage. The negation of negation opens up the possibility of developing the content of the actual concept in opposition to reason. "The cognitive movement of the concept," clarified G. Hegel, - there is no more transition, no visibility in another, but there is development "[1, p. 343].
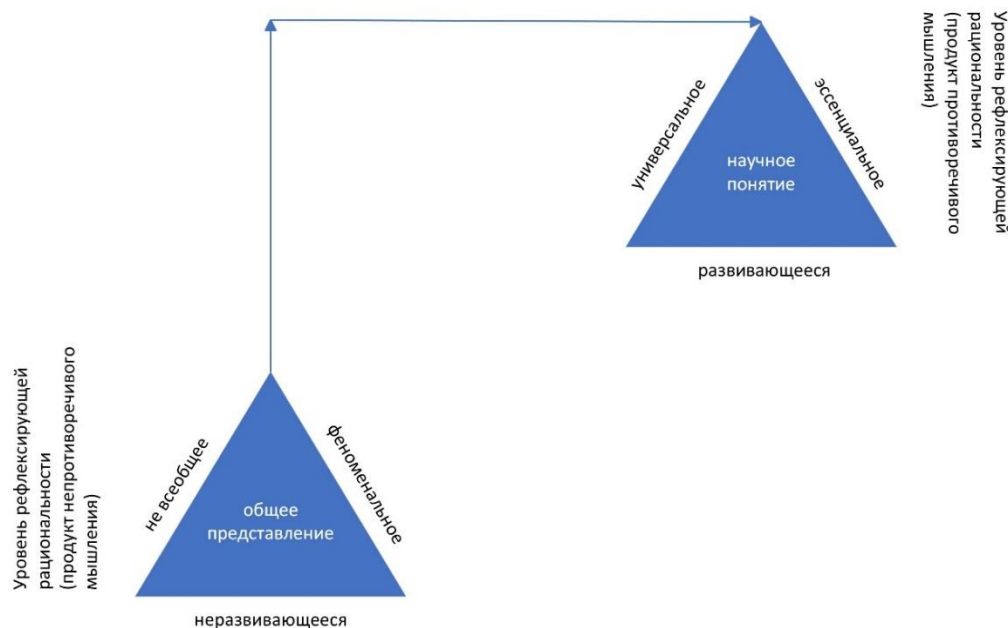

Fig. 1 Climbing of forms of scientific knowledge at the transition from the description of the object to the disclosure of its essence (from the general representation to the scientific concept).

The concept as a higher form of knowledge, not only for its own development, but also for objectification. If to clear the Hegelian interpretation of the concept from the objective-idealistic superstructure, then the key idea is revealed, - only by achieving the conceptual form, the knowledge is made by an adequate creative nature ("natura naturans" and "natural nature").

Science does not purposefully develop the theory of cognition, it enriches it, so it is impossible to construct a holistic theory of cognition without its participation. Г. Hegel, in the most abstract form in the theory of negation, pointed out the meaning of ascension from the general to the particular, from the abstract to the concrete. Neither at the level of universality, nor as a moment of special development of the concept is not free from content. "Free equality with self-determination" is achieved in the presence of some content. Subsequently, the relevant question: where does it go? Universal is identical, explained by G. Hegel, exclusively in the sense that it contains in itself simultaneously special and single "[1, p. 348].

Subjectively formed concept is able to contain in itself a special and unique only as its content, imagined development. Together with the subject, it is reasonable to assume that for this concept already as a special form of knowledge, potentially matured to a similar ascent. In painting, canvas occupies an important place in the preparation, although it does not always belong directly to creativity. Holst should be ready to perform a creative action. Something similar, apparently, occurs in abstract thinking, because it received its own definition.

The form is formed in the process of thinking and in some way its state develops until it allows it to be able to immerse itself in the process, to reflect, to reproduce what is happening to the out-of-the-way out of it. The history of the subjective concept begins with the "content-setting" that limits cognitive activity. In the abstraction of the subjective concept there is not only the negation of its own movement, shown by G. Hegel, but the negation of what can not be the content of the concept at any level of ascension.

Consciousness is accustomed to the practice of understanding the content of knowledge as the assertion of the quality of the content of knowledge. The other side of the process of cognition is the negation in the formation of the concept of everything that does not correspond to this content, as a rule, only implies. In relation to the educated concept, such a proportion of positive and negative is more acceptable than what can be said about the process of genesis of the concept. At this stage, the scales are binding, so possible falsification. It seems that the history of Afghanistan in 2021, with the advent of the Taliban, is an application to the epistemological situation, embedded in terrorism, in which the search for specific definitions of terrorism, terrorism and production activities is clearly delayed.

Terrorists, striving for the originality of their definitions, violate the requirements of the logic of the formation of concepts. G. Hegel repeatedly testified that the subjective concept in the system of Aristotelian logic is like a general representation "When we talk about a concept, usually only an abstract universality appears before our mental eye, and usually therefore the concept is defined as a general representation... It is extremely important both for cognition and for practical behavior, so that we did not confuse the general with the truly universal, with universal "[1, p. 347].

For lawyers who are more interested in the rest of the rest, interesting and example, with the help of which G. Hegel reconstructed unity in the understanding of the truth of the general and specific, concretizing the truth of the universal. Ж.-Ж. Rousseau, in his Theories of Public Contract, emphasized the difference between "universal will" and "universal will." The state must rely on the principle of "universal will", which does not interfere with the "will of all". The definition of a concept cannot be one-sided, subordinated to any particular sign. Robespierre does not rest on his laurels, identifying terror with the practice of rape. Violence is a sign of determination, not just terror, but a multitude of common representations. What adds and points to the revolutionary direction of terror in Robespierre.

From the genius of G. Hegel's "road map" follows the concept of abstract from concrete to concrete and is practically cognitive. First of all, in the abstract beginning of the content of the concept, it is necessary to determine the fact that, loaded with specificity, you must withstand the whole path of ascension. In the end, it is necessary to have a filmed image, overshadowed by the acquired concrete. The concept, developing, remains identical with itself. This is achieved at the expense of the core of the concept. It is invariable. The second output has a direct relationship to the determination of the core content. У Г. Hegel's whole history of the concept of self-sufficiency. He is a follow-up objective idealist. In the context of dialectical materialism, supported by the history of modern natural science, the formation and development of the concept is conditioned by the interaction of rational thinking with the manifestations of objective reality. The concept is not primary, in its consciousness it reflects the essence of these phenomena.

Nature and what gives rise to it as its development - a practical component of social life, continue to experience "homo sapiens" in the stability of reproduction on the basis of transformations of life. The mind has developed its ability to recognize essential relationships. The specific form of knowledge became the concept. Consequently, the core of the concept is the essence of the highest order - the essence of essence. It is in him the knowledge of

the resilience of phenomena to reproduction. Nature and social life are multifaceted and dynamic, so to find out for all these diversities of changing phenomena, the essence is generally more complex, and the "essence of essence" is even more difficult. Cognition, striving to reach the roots of the processes that take place, excludes impressions and urgency. In Russia there is a saying: "Hurry up, make fun of people."

The third conclusion: recognition of the universality of the concept - its kind of guarantee of its application to all volumes of phenomena, determined by the content of the concept. There can be no exceptions. If something turns out in parentheses, then there was an error in determining the content, or did not understand how it should be, that came out of the general wallpaper.

Output four: the development of the concept does not relate to the change of its nucleus. The nucleus is made up of system-forming properties, and the development is the perfection of that system, which sets out the signs of the nucleus.

The fifth conclusion: the concept is a product of production, in which the objectively changing reality with the knowledge of "homo sapiens". Consequently, all traces of cognition have either objective nature - the objects of cognition have not matured, not that it should have been determined, not considered universally, or have subdued the culture of thought.

Historism of the birth of the concept and all its subsequent development convinces that the simple history of the concept does not exist, it is pointless to look for an example of a simple concept. The concept of "simplicity" itself is ambiguous. In fact, the speech goes on different concepts. K. Popper, analyzing the concept of "simplicity", identified three different uses for it - in the aesthetic aspect, in practical and epistemological. On the question: why is the table so highly valued in public consciousness, not to mention already in professional science, K. Popper replied: When our goal is knowledge, simple statements should be valued higher than simple ones, because they communicate to us more, because they have more empirical content and because they are better verified".

Aspiration to the simplicity of expression is natural and can be useful in the production of new knowledge, or development, existing in a new continuation, but to use the simplification of the application should be done carefully, carefully and cautiously. Forgive, apparently, is allowed and the content of the concept, but only then, when such a procedure does not touch the core of content - "the essence of the essence." Analysis of the epistemological situation, complicated and persistent in the existence of terrorism, logically begins not with the systemic status of "terror" and "terrorism", and with the content of these concepts, fixed in the definitions. The criterion is the correlation of the definition of a real event. It is necessary to insert the

studied phenomena into the system of counteraction to a legitimate public order.

All conventional products of terrorist discussions are two signs, common "terror" and "terrorism": extreme to the insanity of cruelty of means and methods and the struggle against the historically complicated order, not the same. Moreover, less a priori terrorists do not simply distinguish between "terror" and "terrorism", they oppose them.

It is understood that in the order of the "terror" version, it is possible to exclude "terrorism", as well as "terrorism" from "terror". Both phenomena are more similar than they differ. Surprisingly another: all domestic authors once came to the dialectical methodology. In our situation, they did not exist as sources used - read F. Энгельса, K. Marx, VI Lenina or G. Hegel. As a methodological basis for the scientific understanding of Hegelian dialectics as a developed local variant of dialectics, the concept differs only from the interpretation of the triad. Terrorists should not be in a hurry to limit themselves to the division of "terror" and "terrorism", but to use the current recommendation of dialectical thinking.

Heraclitus has already taught: "Do not let two people into the same river." Using this thesis of Heraclitus. Aristotle explained: "Everything flows and never is the same" [3, p. 212]. At the same time, Aristotle was not the only thinker of Heraclitus, and in contrast to the dialectical understanding of the changes that took place in the world, he developed the logic of identity. Aristotle's statement does not exist in essence. She remains equal to herself. Terrorists chose Aristotle's version and simply opposed "terrorism" and "terror". Considering it is not purposeful to look at them historically. For theologians, among those who are and philosophers, it would be necessary to immerse oneself in the theory of cognition, its dialectical model. Then they would be able to fruitfully use the valuable ideas of Heraclitus, whose contemporaries called it "dark", and the philosopher did not protest,

Apparently in the Heraclitic image of the river flow was understood only G. Hegel. It is impossible to enter two rivers in this river, - shows no movement. The essence of the movement is that there is no way to do another and only another. Another must be another of this river. In the theory of development of the concept of G. Hegel concluded this idea of ancient Greek dialectics. Terrorism and terrorism differ as manifestations of the terrorist struggle, its stages. They were told the history of the movement, which was and will remain, in fact, what was born.

Out of the historical context, to define "terror" and "terrorism" will not work. Some fantasy here will not help. Terror and terrorism are phenomena of general history - two attempts to enter one and the same river of Heraclitus. The professional plot of terrorists at the sources of the rise of terrorists - the

Czech struggle slows down the whole process. Прав Ю. С. Gorbunov: The whole process of research has a single basis - the definition of the most concepts of "terror" and "terrorism", although all subsequent investigations are based on these concepts or operate on them. From the correct definition of them in many respects depends on the reliability of the conducted research, as well as the results obtained "[4, p. 31-40].

Ozadachiv colleague on terrology, Yu. C. Gorbunov tried to rectify the situation, but the promotion turned out to be traditional. Instead, in order to offer its innovative course, restoring history in cognition, it went through the path of modern social sciences, - described the group of historical realities, the pursuit of historical reality, 300 opras. Terror remained on the side.

Expression is a product of real history, concept is a product of cognition of this history, definition of concept is a product of reflection on products of cognition. "Reflexive definitions should be understood and have the meaning of each in itself, especially from the opposite definitions," - explained G. Hegel, precisely, but in the sense that their identity is set, that from every moment can be understood directly from others and together with others "[1, p. 347-349]. For dialectics G. Hegel's definition is a process that does not exist outside, it must be determined by the concept of self-movement. Instead of this Yu. C. Gorbunov approaches the technology of external description, which is suitable for the application of the definition only to the development of the definition. The classification of possibilities of approaches to the definition does not interfere with the definition of the case, but does not advance to the knowledge of the will. When studying the concept of "terrorism". - writes the cited author, - several approaches to its definition are used: biological, linguistic, sociological, political, international, criminal law "[4, p. 32]. We add to this list the humanitarian, culturological and instead of defining the concept we get a description of the phenomenon, expressed in private representations about it.

Terror and terrorism are multi-social phenomena. Socio-economic and socio-cultural nature of the terrorist struggle are concentrated in the political direction. For a specialized subject-specific research, a characteristic predominance of interest in the fact that creates a cash form of the phenomenon. Terrorists, as a rule, do not distinguish from the very beginning of the analysis of the actualization of the distinction between terror and terrorism. With great interest, they compare terrorism with extremism, military, guerrilla movements, sabotage, and terrorism. Referring to the concept of "terrorist fight" is unique and is still rarely used by the term itself, often using the complicated term "terrorist activity".

For example, we will go back to the circumstantial article by Yu. C. Gorbunova, Doctor of Law, Professor. The author, defining the meaning of the differentiation of the concepts of "terrorism" and "terror" for the practical application of the theory, rightly emphasizes the need to take into account that for practical and effective counteraction to terrorism, a definition is required that would allow identifying terrorism as such, distinguishing it from complex phenomena, and declaring it criminally punished" [4, p. 32].

Recall that the author declared in the title of the article the relevance of the distinction between "terrorism" and "terror". Inexplicably, for some reason, defining a central problem, he forgot to specify a number of similar phenomena with terrorism - terrorism. It is possible that it happened by chance, but we will not forget that through chance it breaks the path of necessity. Turning to the history of terror, Yu. C. Gorbunov prefers a game of terms, which he uses more sympathetically, defining the object of terrorist activities, the term "political opponent". The history of terror began precisely in the context of the political struggle against the existing state, its structure, representatives and politicians. Terrorists have been fighting for domination and political restructuring in society.

The League of Nations in 1937, in the Convention on the Prevention of Terrorism and Punishment for It, defined terrorism as a criminal act directed against the state. The adoption of the Convention by the 24 signatories was insufficient, but to the terrorists, if they do not want to be dependent on ideological struggle, it is important not formally, but a real assessment of terrorism. The concept must reflect the essence of the action as it is. The problem of the political "essence of the essence" and the first derivative of its decision - the definition of the co-purchase of the subjects of the terrorist struggle, the most vulnerable place in the terrorist concepts of terrorism. In order to somehow reduce the degree of tension, the terrorists are shifting the investigation to the side of the technological component.

In the crisis epistemological situation Russian terrologists are interested not only in the object of cognition and the improvement of methodological approaches to it, but also in the description of individual receptions in cognition [4, p. 31-32]. To define the essence of the essence can be exclusively as a abstract content, which has a universal scale in space and time. Terror and terrorism are multi-social phenomena in their nature and political in their nature. Therefore, the accumulated empirical experience of research in their private cognitive practices - historical, legal, sociological, political, culturological, Czech, psychological, economic material can only be given. The same reasoning requires a philosophical scale. It is necessary, first of all, to transform the general representation in the concept. In the second,

Simply put, it is important to first define the concept of "terrorist fight". It includes all its forms - individual actions, organized terror, terrorism,

international terrorism, terrorist attacks. From the historical experience of the development of the terrorist struggle to trace the transition from terrorism to terrorism, to differentiate them by nature, to give a definition of terror and terrorism, and in conclusion to describe the modern form of terrorism. In the combination of terror and terrorism are present in their essential unity, but inside it will have a qualitatively excellent status. To promote cognition, it is necessary to compare not conceptual author's concepts, but the concept that it objectively reproduces in consciousness. Just getting clarity in reflection has the meaning of inspecting differences in looks. The researcher is initially obliged to be extremely objective,

Comparison presupposes an objective link of reflection. It is in the form of acknowledgment of the actual signs of a terrorist fight with terrorists, but some of the acknowledged acknowledgments characterize the concept. In the concept of the contents of the system coexist and only in the system reveal the essence of the concept. System-forming symptoms are not even totally equal to the educated system of content. A one-sided look may be useful in a work order, but the high probability that he will lead the researcher into a dead end of knowledge. The usefulness of far is not always the prelude to the truth of knowledge.

In epistemology, regardless of all the existing contradictions, thanks to the historical discussions, a definite order was formed, embodied in the demands and restrictions. It is determined by reality, expressed in concepts, and the concept itself, that is, it is necessary first to determine the content of the concept, then to agree with its definition. Differentiate specific phenomena purposefully in the light of the task of knowledge on the basis of the formed concept.

In those cases, when there is a general professional recognition of the content of the concept of some phenomenon, the overcoming of differences is used in the convention. Analyzing the specifics of the adoption of conventional decisions. K. Popper believed: "For the conventionalist, the adoption of universal expressions is determined by the conventional principle of simplicity. Therefore, the conventionalist chooses the simplest scheme "[2, p. 145]. For visibility. Popper compared the choice of a conventionalist with a verdict of jury. Verdict "plays the role of a true statement of fact." However, it is obvious that from the fact of taking this statement by jury, it does not necessarily follow its truth. This circumstance is fixed in the legislation, which allows annulment or revision of the jury verdict "[2, p.146].

In contrast to the obligatory presence of juries, terrologists complicate the problem in absentia in the form of literary work. So it is easier to feel the right of their judgments. Expert next to none. Possibilities of jurors are also limited, they act strictly individually during the trial, which does not prevent them from

judging the case by limits. To have one's own opinion about it, as it follows to define the concept of "terror" and "terrorism", is unequivocally important, not forgetting that in the absence of objectively conditioned content of positions, your understanding of the existence of the object remains in its original form.

B. B. Sidorov leads the definition of terrorism from the "Explanatory Dictionary of the Russian language S. И. Ozhegova. and N. Yu. Swedish: "Terrorism is a policy and practice of terror" [5, p. 736]. And absolutely rightly asks: what is the need to form thinking about the rules of logic? It is obvious that the definition of terrorism through terrorism will inevitably lead to the definition of terrorism through terrorism. Those who act in such a way do not understand that the widespread and persistently reproduced socio-political phenomenon can not be its own, let alone contradictory, ideology. The reality of the history of terror testifies to the fact that the policy of terror was not impromptu.

P. A. Kropotkin is a well-known scholar and ideologue of one of the directions of anarchism. Western Europe knew him well as a great scientist and as a revolutionary, Prince P. A. Kropotkin was the forefather of Rurikovich, an active participant in the political movement of the Russian youth, from the end of the 1870s, and formed an organization of revolutionary terrorists. Memories of P. A. Kropotkin gives a clear understanding of the fact that terrorists have an ideological concept. Moreover, she was different inside herself, as a critical awareness of what it is necessary to be a struggle with the absolutism of the monarchical government for democratic changes, continued.

P. A. Kropotkin called and the period of formation of the ideology of terror - the interval between 1875 and 1878. Back in the early 1870s, P. clarified. A. Kropotkin said, "We have not discussed the necessity of a political struggle in our circle, but they have not come to any conclusion. The apathy and indifference of the rich classes was hopeless, and the frustration among the youth had not yet reached that tension, which was expressed six or three years after the fight of the terrorists under the leadership of the executive committee. Small - such a tragic irony of history - and the very youth, who Alexander II in blind fear and rage sent hundreds in the link and on convictions, protected him in 1871-1878. The most socialist programs of the circles interfered in the repetition of the new conquest of the tsar. The slogan at that time was: "Prepare for a broad socialist movement in Russia among peasants and workers… [6, p. 280].

"The domestic revolutionaries of the nineteenth century hoped that with their help in Russia there would be a place in the eighties of the eighteenth century in France. Preparation for terrorist activities in Russia until the end of 1870s. demonstrated only

separate personalities. "Organized mugs persistently against this," - stressed P. A. Kropotkin.

The path of knowing the essence of one is through its reflection in the form of understanding. The concept can already be, or it needs to be formed, in our case, by the combined forces of scientific and philosophical research of the object - a terrorist fight. A simple example of the past, present and future of all healthy countries reveals to specialists "secret" road map to solve any significant problem. The whole family - the parents of the future child, relatives - are eagerly waiting for an important event, when he () should become another inhabitant of our planet. All satisfied, but satisfied in some way. There is a problem: who is born - a boy or a girl? Someone very much wanted to be a boy, like Peter the Great, was forced out of the heir's absence, to change the understanding of the biological status of the heir to the throne. For the first time in the history of Russia, a woman was brought to the throne of the Russian Empire.

The mismatch of priorities does not necessarily manifest itself externally, but it is very often a place to be. Nature is not a complete link of interests, as a rule, - the desire of Petra the Great - exclusively - at the level of knowledge of the origin. In order for everyone to agree, it is necessary to raise the reflection to the conceptual form. Understand who and what such a child? And to understand, not only in the abstract, distracted by the specificity of the life situation, but, on the contrary, precisely in the context of its image. Let us recall the Hegelian form of the development of the concept, - at first it is formed as a universal knowledge - "the child in general"; then, as the knowledge of a special, conditioned by cash reality; after what is embodied in the concept that reproduces the only phenomenon of the general order.

"Terror" and "terrorism" - the concept of a common range. They reflect the antisocial form of the struggle for the right to political prostitution. It is possible to understand in their specificity only by developing the general concept of "terrorist fight". There is no other way. Terrorists are more likely to produce a definition than a defined reporting system. It is strange that lawyers, discussing the distinction between terror and terrorism, do not ask the classic question: who needs to immerse a professional thought in the pursuit of legal disputes, instead, to dispel the idea that terrorism is an argument against the history of history? Why not take for granted the notion of "terrorist fight" as a general reflection on the recognition of wanted objects. There are all specific forms of its organization - "special", according to G. Hegel, the stages of development of the concept.

Terror, as any socio-political phenomenon, has historically evolved by adapting to, on the one hand, changing the conditions of action, and on the other - experiencing the need for the realization of accumulated potential. The content of the concept of "terrorist struggle" remained all the time before, due to the vector of development, changed that part of the content, which is formed as a derivative of the "core", the essence of the essence of the essence. The terrorist fight was not born on the side of the historical movement. Its autonomy was originally dependent on the flow of historical change. Within the framework of systemic knowledge, the terrorist struggle has maintained the status of subsystems in the structure of the socio-political organization of society. That terrorists are trying to determine without special success,

Who did not realize this, fell into dependence on the ideological factor, which worked well on the speculative assessment of the changes in the world after the liquidation of the Soviet Union. Terrorist struggle in the policy of designing a new world architecture has become a topical factor for individual states seeking to clear the way to a single government of the world or in the regions. Their world history is not a decree, to the historical experience, convincingly demonstrated the illusory nature of the world power, they are treated as imperfect, hoping to win, relying on their economic, self-serving, military policy.

Naive to perceive the resilience of the terrorist struggle in the course of the millennium as a historical condition, dreaming to submit to it, to make a regulated tool of political struggle to divide the world and divide the world. Terrorists, in principle, do not go against the time alliances, helping them to solve their political, financial, image problems. It is necessary to know the history of the terrorist fight. It is impossible to subdue terrorists, it is only possible to reduce their activity at the expense of real concessions. And here enters the politics of ideology, with the help of which they want to achieve partial interaction with the terrorist movement.

In the last 30 years, there has been an aspiration to differentiate terrorist organizations, especially dangerous, dangerous and conditionally dangerous, with which the purpose is to negotiate. Such an ideological reception is conditionally productive, even if there is only one terrorist fight, as well as terrorists, understanding the significance of consolidated actions, actively correlate their relationship. Examples of cooperation are explained by the fact that terrorists have arbitrarily recorded unfavorable. "Whole countries, possibly and not with the most civilized (if not say, odiomy) regimes, claim А. В. Киба и В. А. Fedorov, without hesitation on those grounds, began to consider as a gardener of international terrorism and to list them as "axes of evil", deserving of punishment (committed by terrorists - Yu.M.). When approaching a real danger, the authors conclude,

A. B. Kiba and B. A. Fedorov - historians do not rely on discourse, but on historical validity, which allows them to give an objective assessment of the studied phenomena. Deserves attention to their analysis of the definition of "terror" and "terrorism"

BES 1997 edition. It would be only on this example to show the ideological pressure of those years. In the 1990s, there was a period of publishing activity at the expense of the Soros Foundation. The authors, unfortunately, did not specify the name of the publishing house that published the BES, but the spirit of the definition, confusion in the concepts - signs characteristic of all the work of the Foundation "Open Society".

Unfortunately, the well-known authors also did not beat the ideological traps. In the absence of clear signs of terror and terrorism, they recognized the subject of the terrorist struggle of the state in the face of history and logic. Terrorism is not just a political battle, for example, against public figures or separate political manifestations. Terrorists began their struggle as a means of political restructuring of the state. In all their struggles, their struggle was against the state for power. It is possible to argue about the many signs of the terrorist struggle, except that terrorists have always been the principal enemies of the state, logically understood that it is the backbone of the existing political structure, the capital. The state is the enemy of all terrorists.

Going out of the history and logic of the terrorist struggle, the state can never be a social entity, neither terrorism nor terrorism. Even in the case of victories of terrorists, educated by the state, there will be no subject of terror on formal grounds, and in real history, the state, created by terrorists, will be forced to change the accents and scale of their political actions. The United Nations has included the Taliban in the list of terrorist organizations. The corresponding decision was taken and at the level of the member states of the United Nations. The Taliban's policy was to define a terrorist fight in a series of signs [7].

However, at the same time, when the organization fought against the restricted continent of the Soviet army in Afghanistan and fought with the government of the DRA, it did not have its own classic form of terrorist movement. At the end of the XX century in Afghanistan there was a real civil war. Following the practice of confessing to terrorist movements, which did not have a full set of notions of the concept of "terror" or "terrorism", without strain on the number of terrorist organizations can be engaged in "terrorists", "petty thugs" and "pettyurev".

Ideologists and the most common terrorist struggle, and expressing the most common interests of the policies of "managed chaos", or "unipolar world", it is important to leave the definition of terrorism and terrorism in the form of incomplete definition of the goal. We do not agree with the differentiation of terrorism into individual, group, state and collective, and on purpose - criminal and political. Terrorism and terrorism are immanent in the nature of politics and political orientation, and until then, politicians and lawyers do not allocate a terrorist crime to a particular category, such as Nazism, fascism, genocide, they will kill everything.

The United States handed over the Taliban to Afghanistan. The Taliban have secondaryly formed a state government. What to do with the UN and other states? USA, Germany, Great Britain far behind mountains, seas, oceans. In the neighborhood: Tajikistan, Uzbekistan, Kyrgyzstan, Iran, Pakistan. The people of Afghanistan need to be helped to restore the destroyed without the participation of peacekeepers from the country. The Taliban are aware of this, they are fighting with their own people - Pashtuns, Uzbeks, Tajiks, they do not judge by official statements and visits. The world community must determine what type of terrorist fight the Taliban has and act accordingly.

If the "Taliban" is a terrorist movement of the "terrorism" type, then we need to continue the fight uncompromisingly. blaming the people of the country for the suffering, which is inhumane and undemocratic. And if the Taliban is a terrorist organization of the "terrorist" type, then there is a prospect of its evolution. The United Nations has backed a U.S. assessment of the Taliban's links to al-Qaeda, captured by bin Laden's CIA. The fact that the Taliban is not an organization of angels is obvious to all. But this certainty can not serve as a basis for "stretching" the signs of the organization to define a "terrorist" type of "terrorism". The UN adopted a resolution that its history entrusted again to her to return to the new circumstances of historical reality. However, once the status of the Taliban is determined, it should not be linked, but in line with real practice. Indeed, the Taliban have shown a willingness to fight with IG,

Doctor of Juridical Sciences, Professor B. B. Sidorov proposed the following definition of "terrorism", clarifying that it is within the framework of a single general law, on the fact that instead of defining the concept of terrorism, a description of the real movement of the movement - "Terrorism" united in the concept of "terrorism". We are not experts in the description of criminal activities. The general impression is as follows: the author was able to gather in the smallest measure together all that is capable of terrorists, so the practical legal value of the composition of the definition of the indisputably significant. But the author did not refrain from incitement to join in the relationship of "terrorism" and "terror" and to participate in the discourse.

B. B. Sidorov distinguishes terrorism and terror as a whole and part of a criminal phenomenon of political origin (in any case on a scale). Terror is not the same as the method and means of carrying out terrorism. On the facade of the definition there are both variants of the logical continuation: and the possibility of the existence of terrorism as an autonomous political practice, and its absolute

predicate dependence on terrorism in the context of the instrument of existence.

As a result, the problem of defining terrorism is resolved in the author's editorial office, and there is no "terror", but the author is clearly opposed to the story. Terror originally contained all the signs of a socio-political struggle: ideology, objective determination, methods of action and means. The obvious simplification in the characterization of terror makes the author's conclusion extremely arbitrary and subjective.

The researcher without labor pays attention to the fact that the knowledge of terrorism as an auxiliary function of terrorism, opens the prospect of recognizing terrorism as a means and other policies, excellent for terrorism, for example, the state. It is no coincidence that terrorists have a popular idea to differentiate terror and terrorism from dependence on a social entity. The subject of terrorism is the state or its power structures and terrorism is directed against civilians. Terrorism or the weapons of the excellent from the state of the subjects and serve as a means of "punishment" of the state. Everything is simple and clear, thanks to the simplicity, and that such a division of terror and terrorism contradicts the history of the terrorist movement and leads to the substitution of these concepts, not the table.

С. И. Cousin drew attention to the fact that in the Criminal Code of the Russian Federation there is no definition of terrorism, there is only a characteristic of terrorism (art. 205), which can qualify as the recognition of the identity of these concepts, in the context of criminal law. Interesting definition of terrorism in FZ "On the fight against terrorism." We fully accept this definition, as it is the most effective and precise: "Terrorism is an ideology of violence and the practice of action to take decisions by state authorities, bodies of local self-government or inter-agency or inter-agency »[15].

The reality of the growth of the threat of terrorism in the face of the global process of social development has forced the UN General Assembly to accept the urgency of the counterterrorism struggle. In 1972, the Special Committee on International Terrorism was formed, which failed to develop a common definition of terrorism. Going back to 22 years, the UN General Conference returns to the political interpretation of the fight against terrorism and in Resolution № 49/60 "Measures for the Elimination of International Terrorism" gives such a definition of terrorism. "Terrorism is a criminal act, directed or calculated on the establishment of a terrorist environment among the general public, groups of individuals or specific individuals in political purposes, which in any circumstances, politically motivated, can not be ruled by any ideologues;

The content of terrorism in official documents is due to the desire to improve its practical activity, so they try to avoid the possibility of discrepancies in the text. The so-called resolution uses both terms: "terrorism" and "terror". "Terrorism" is defined as the concept of a collectivist species, the content of which is described in detail and given a principled assessment of the attitude to it as a movement, incompatible with social progress as a whole, neither humane nor humanistic. "Terrorism" as a manifestation of a political struggle attributed to extreme antisocial actions, so that it is absolutely abused in relation to all without exception to the people, consequently, in terrorism, inhumanity is unattainable. Simply put, terrorism is a disorder of violence.

The term "terror" is also used in the Resolution, but in a narrow sense - for the characteristics of a particular insurance policy, insanity. "Terror" is a state of hopelessness in the public consciousness, a crisis of hope, a readiness of unconditional submission to the intentions of terrorists. In general: "terror" is the price of terrorist activities, so it is necessary to create a final goal - political and social restructuring in society. У. Lucker also defines terrorism as "the illegitimate use of force for the realization of political goals by threatening innocent people" [cit. on 10]. If to distract from the details in the definition, then terrorism U. The lacquer looks like an illegal force, the name of which is "terror".

Terror Many terrorists identify with the instrumental part of terrorism. According to the proponents of instrumentalism of terror, there is a clear weakness. Consciously or not at all, they restore the interpretation of terror by Robespierre, simplifying the understanding of the latter. Robespierre saw terror not as a means of politics, but as a struggle for politics with the enemies of revolutionary conquests. Terrorism has historically been unfairly reduced to the tools of political struggle, it began as a means of political struggle with support for specific methods and means. So it is necessary to represent its architecture.

Questions to another: was terror preserved as a political force, or did history transform it? Terrorism - the successor to terror or a form of political struggle parallel to terrorism? It is necessary to determine the degree of kinship of these two political movements, to solve the problem: how to deal with terrorism and terrorism - the development of a terrorist fight, or functionally. Such problems imply philosophical analysis. It is necessary to assess the situation historically, - how many of these versions are placed in the process of public development, in the first place; epistemologically, - the level at which the process of cognition is achieved in scientific studies: whether it continues in the form of common sense representations or is included in the circle of conceptual reflections of ischemic phenomena. Secondly, methodologically, in what process in the process of cognition involved dialectical methodology

and modern methods of general cognition, first of all, a systematic approach? It is necessary to give and ontological analysis of the discourse - how much did the terrologists get involved in the discussion by clarifying the benefits of their versions, leaving aside the socio-political nature of the analyzed phenomena.

Defined higher tasks are not allowed in the areas of specialized scientific and professional research. Lawyers, political scientists, sociologists, psychologists and, of course, linguists consider the object subjectively - each with its own side. The existing philosophical associations are of interest to them, and the corresponding complex works, devoted to the topic, are clearly insufficient, monographs are not found at all. Philosophers for some reason did not consider the problem relevant, relying on the analysis of narrow specialists. We do not claim to resolve all the issues raised in the discussion of the problem, but we need to start the process of philosophical research. The relevance of finding out the reasons for the effectiveness of the counter-terrorism struggle is due to the inclusion of its main philosophical forces. Already now actively discusses the hybrid form of the world war,

The problem of the inclusion of philosophical reflection on any topical issue is not so much the complexity of the object, but rather the contradiction of the philosophy itself. She has never been a co-buyer of like-minded people. On the contrary, all its achievements in the knowledge of the world and the knowledge as a process are not the fruits of cooperation. It is a product of competitive thinking in the mind. Together with that philosophy could not have had two and a half thousand years of history, if in philosophical discourses there was no such thing as an anchor, preserving the definition of the position of the ship.

Philosophy came to replace mythology and religion, as well as relied on myths and belief in them, in that historical time, when it became clear that the mind was to descend from the heights of fantasy to investigate what is the essence of existence. The development of civilization has required knowledge to improve the resistance potential of "homo sapiens" at the expense of the inclusion of active forces in the transformation of action. The progress of civil society has been necessary in the development of its resilience and democracy as a condition for the establishment of a free personality. It was necessary with the help of common sense to overcome the state of constant struggle, provoked by the consciousness of national superiority. It could only be done through the realization of a single path of civilized progress. This is the time of the historical understanding of the universality of history, K. Jaspers called it "Osevym" [11].

We have repeated the written descriptions for the understanding of truth, they are in the third millennium known to all thanks to education,

generalizing and reproducing the cultural part of social progress. The quality of politics, which politicians themselves still do not want to understand properly and appreciate, is determined practically through the quality of education, its readiness to arm the consciousness of the individual with the belief in the all-conquering power of human intelligence, the highest appearance of which, correct, is the spirituality of the individual's thinking.

A. Schopenhauer divided the individual into "what he is" and that "what he has," insisting on the priority of the latter as a sign of his spiritual development. "We see," wrote the philosopher, "very many people, untiringly working, hard-working, like ants, from morning till evening engaged in the presumption of their already existing wealth." They do not know anything out of the narrow circle of needs for this purpose; their minds are empty and therefore reluctant to all the rest. For them inaccessible higher, spiritual research, which they are desperately trying to replace the themes with fleeting, sensual, short-lived, but many money-demanding pleasures…? [12, c. 24]. And concludes this fragment of reflections on the wisdom of man in his personal incarnation of the words of the classic European philosophy are still more relevant for the XXI century, than for his time: "… For the happiness of human life, the most essential thing is that a person has himself" [12, p. 24]. And not for yourself, let's add from ourselves to the words A. Schopenhauer.

A. Schopenhauer was a witness to various forms of terror - revolutionary, counter-revolutionary, individual, collective, national, transnational, speculating on religious values. Terror is one of the manifestations of the irrationality of the "world will", speculation on the blindness of the attraction of man to life, human suffering in the realization of his helplessness to resist the "world will". Ability to life is proportional to its resistance to the manifestations of "world will".

Means of human rescue, under the auspices of A. Schopenhauer, it is philosophical knowledge, aesthetic contemplation and the ability to compete. Our understanding, he assumed, is a vision, in the true reality of the people, and philosophy helps them to understand their unity. Man, beginning with Socrates, the problem, integrating philosophical searches. At the center of attention: the nature of man, the meaning of life, the form of life and possibility. The subject of man has a direct attitude to the achievement of clarity in the interpretation of the studied phenomena. Terrorist struggle, in the opinion of A. Schopenhauer, there is no manifestation of "world power", its unconsciousness and irrationality.

It is the practical political activity of the people, therefore, to look for subjective reasons for the fact that people are fighting terrorists, those who fight with them, and the suffering majority does not want to rule, the terrorists do not want to. In missed, or planned

defects in education, perversions of cultural heritage and cultural traditions. All the reactionaries began repression with simplifications in the formation of the philosophical component.

But the terrorist fight is a coup and a practical action. It creates not only a cultural deformation of the personality, it is a product and a practical contradiction of social development. Philosophers have always debated about the nature of the world, and it was not the case that the problem of the nature of things and phenomena existed in philosophical reflection. Scholars like philosophers have an interest in the nature of phenomena. The description of the phenomenon for modern scientific knowledge is not enough, it is necessary to understand what is manifested, to look inside the phenomenon, where the "hidden" basis and the reasons for its formation.

In the available terrological literature there is a stated characteristic of terrorism and terrorism, it is very rare to register their "complex" social nature, as a rule, without deciphering the concept of "complex". The complexity of the nature of terror and terrorism is conditioned by a specific social composition - multisociality and a combination of different qualities contradicting the objective origin. Terrorists are fascinated by the fact that they are able to measure and describe the means of specialized professional tools, thinking obviously that it is so simple and definite. In fact, they simplify the process of cognition, and this reception always presupposes. Instead of immersion in the actual nature, the researcher goes to the side of the frequency.

Let us recall that the concept differs from the representation, including the general, its universality. It, according to Hegelian terminology, still develops in a special way - preserving the inviolability of the "essence of the essence", its content, its core, around which and all the changes occur. Changes in the content of the concept are reminiscent of the physical basis of chemical processes, when electrons are displaced by their orbits, run away, are replaced by the stability of the nucleus and the stability of its charge.

A large group of terrorists maintains their views on the conflictological nature of terrorism and terrorism. Among them are well-known researchers from Western Europe and the United States: R. Darendorf, G. Simmel, L. Kozer. Unfortunately, in the eyes of terrorists, convinced that the terrorist struggle is rooted in social contradictions, the contradictions themselves are interpreted more abstractly, the scheme of management theory is used. Terrorists oppose the subject and the object of control.

Terrorists appear as an expression of protest against a violation of the balance of interests in politics. In the conflictological version, it attracts the fact that its developers are trying to overcome the one-sidedness of the assessment of the origin of terrorism.

His measure of responsibility for terrorist methods lies in the fight against the rulers. From the structure of power requires a political will, aimed at the regulation of similar conflicts, it is necessary by political means to exclude the possibility of their aggravation to violent forms [13, p. 15].

The idea that the degree of reproduction of terrorist organizations and the nature of their actions are, let alone conditional, but indicators of the quality of socio-economic policy, promising. In any case, the sustainability of the reproduction of terrorism, the state policy has a direct relationship, and it is not here as a service of the power agencies, and it is about the imbalance of social policy as a whole, lack of dignity. We have already noticed that the complexity of the fight with terrorists is due to the multi-social nature of terror and terrorism. The effectiveness of counter-terrorism struggle depends not only on experience, mastery and courage of those who protect the conquest of social progress, protect life, health and honest work of citizens.

Significantly, to a greater extent, it depends on the political response of the state itself, due to the fact that the modern policy of the Czech reaction to socio-economic disparities in public development. The reproduction of the terrorist struggle presupposes a certain state of the economy, public mood, culture, educational policy. All acknowledged thoughts on the extension of the last two centuries have warned about the need for enhanced educational activities in the direction of acquisition, not on the amount of knowledge, but on the meaning of their personality.

Consciousness is not a wallet, not a bank account, it is an effective tool, it needs to be perfected in the context of self-expression, to learn to think. Use ready-made knowledge without perspective. Systemic and non-systemic opposition constitute a legitimate (second - conditional) part of the political pressure on power. Political extremism - the core of antisocial struggle - does not regulate its own struggle with the existing legislation, or, as repressive policy, the legitimacy of the necessary editions. Political extremism includes: terrorist struggle; neocolonial politics; genocide; racism; fascism; Nazism; political repressions; intervention; facts of military-political actions.

Terrorist struggle is one of the forms of political reaction to the existing order in society, one of the ways to oppose the policies of the state, so it is important to consider it in the system of the opposition as a whole. It reveals the possibility more precisely to determine its socio-political status. On our view, developed on the basis of historical analysis and critical understanding of the already obtained theoretical results, the scheme of systematic positioning of political movements can be seen in the following image.
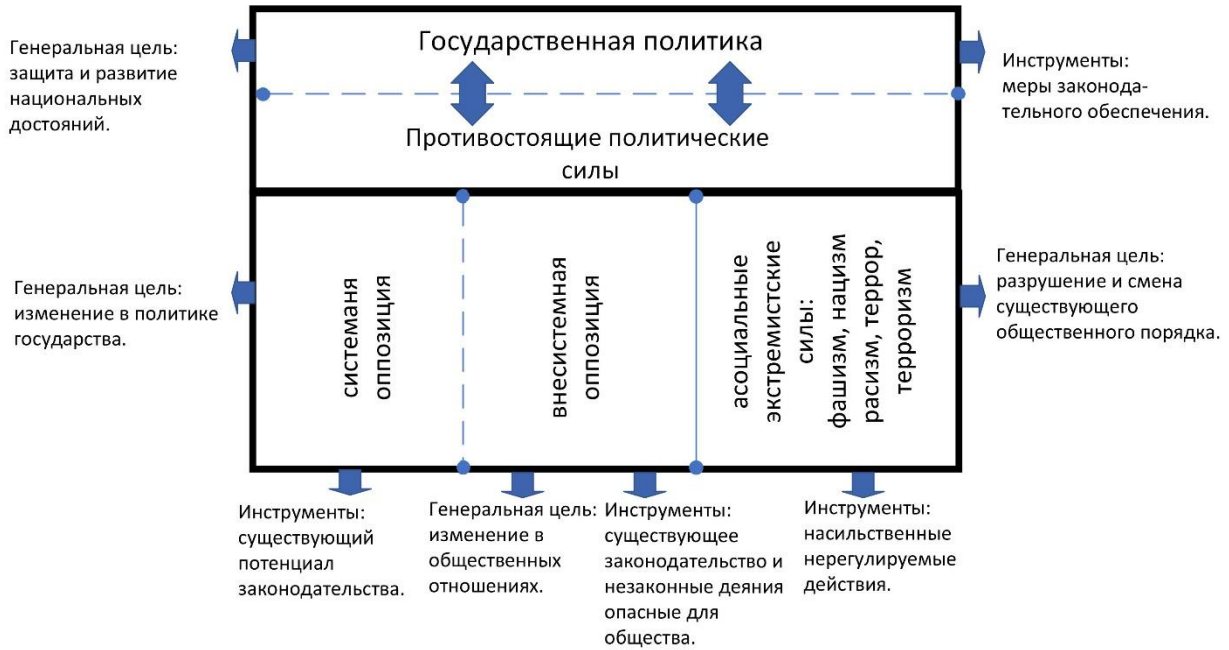
Fig. 2. The system of political movements in modern public order.

To the officially recognized notions that divide the opposition political movement into a "systemic" and "out-of-system" opposition, we have added the notion of "antisocial extremist forces." Formally, "fascism", "Nazism", "racism", "terror", "terrorism", formed as the opposition's power policies, only coming to power, they acted as an instrument of opposition to state policy. The so-called political movements, hiding behind sign and verbal support in our time, are radically different from the "systemic" and "out-of-system" opposition. It would be wrong to place an antisocial "opposition" in the general ranks of the opposition movement with neither a humanistic nor a democratic point of view. At the same time, antisocial struggles on formal grounds belong to the opposition.

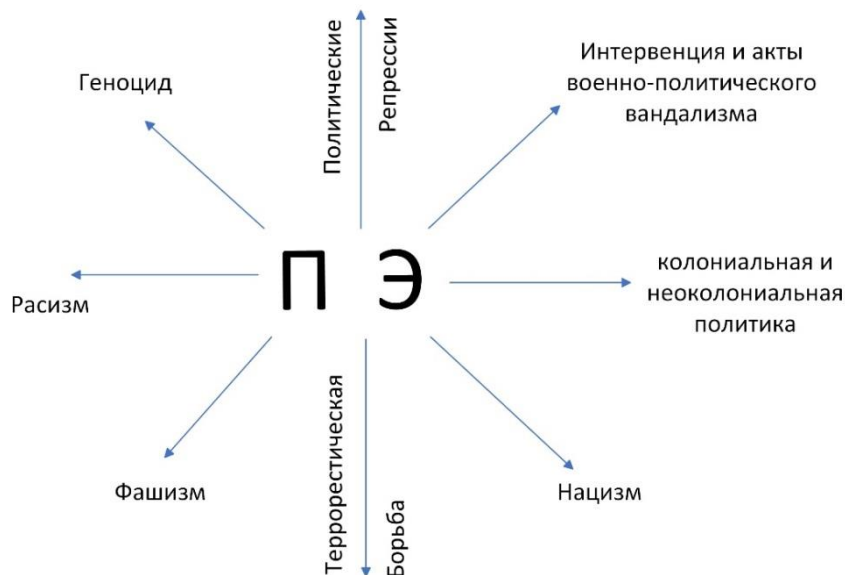Figure №3 gives us a representation of the diversity of political extremism.

Fig. 3. The architecture of political extremism

Hegelian concept of the concept of the evolving knowledge from the abstract to the concrete opposed to the empirical theory of knowledge of classical science, the contemporary to which he was. Already, non-classical science has essentially tested the value of inductive methods as basic in scientific knowledge. The post-classical science does not deny the significance of empirical experience, it revisited the

assignment of experimental methods. If earlier, especially during G. Hegel and I. Newton, everything in science began with the acquisition of empirical material, then in our time it serves as a theoretical systematic thought.

Terrorism appeared and moved as an empirical science. The main, even more precise, the general task is to develop a scientific approach to the effectiveness of the state scale of counterterrorism policy. For its cooperation with related sciences, it is necessary to reveal the reasons and factors of resilience to the fight against terrorism and to explain, as possible, to deprive terrorists of the basics of social co-existence - circumcision. However, the empirical nature of terrorism does not only contradict its theoretical or fundamental sciences. What would not be science, it is science and is subject to the peculiarities of scientific knowledge, bound to be in the trend of general movement.

"Empirical sciences," confirmed K. Popper is a system of theories, so the logic of scientific knowledge can be defined as a theory of theory. Scientific theories are universal statements. Theories are networks that are meant to capture what we call the "world" for their awareness and possession. We strive to make the cells of the network all the more fine "[8, p. 82]. The conclusion of an authoritative expert of scientific knowledge does not follow as an expression of distrust of the experienced description, simply K. Popper testifies that in the newest science empirical experience does not serve as the beginning of cognition, it itself is under the control of reflection.

K. Popper was not a supporter of the development of scientific knowledge, the philosopher preferred to say "the growth of scientific knowledge." The reason for the refusal to acknowledge the development and replacement of his growth, - the lack of a clear criterion. We are interested in the fact that K. Popper, in his opinion, confirmed the thesis of G. Hegel on the ascension of the general to the private, abstract to the concrete. Terrorists, energetically discussing the question: what kind of "terror" and "terrorism", in a surprising way, avoid that communication, which, in the case of successful development, allows them to answer the above question.

The concept, or for the beginning, the general representation of the "terrorist fight" is to stop the process of "stockpiling" knowledge in private. Terrorists remind miners to dig deep into mines. Time to unravel the knowledge of the top. У И. Р. Pavlova somehow became interested in his assessment of the concept of subconscious Z. Freud, he replied: Z. Freud is a great scientist, we dig together in the mysteries of human activity. I was lucky, so I dug up, to the light, and he dug deep, went into the subconscious. Three hundred definitions and tendencies to their magnification lead to the idea that they act without the source of light. The concept of "terrorist fight",

uniting all sides of terrorism, can "enlighten" terrorists.

What is the cognitive force of the concept of "terrorist fight"? In its systemic character and in historism. The whole range of terror and terrorism does not deprive them of their image and at the same time adopts a single process. The nature of the essence of terrorism and terrorism is difficult to deny, especially when the knowledge is at the level of empirical description of the phenomenon. Even those who challenge the logic of definition, oppose the subjects of terror and terrorism, agree that and terror, and terrorism are similar in methods and means of action. Sovokupnoe representation in the concept of "terrorist fight" provides them with a systematic position in the content of the more general, in particular, the general concept.

The systemic value of the concept of "terrorist fight" is determined by the presence in its content of two existential symptoms, universal for all types of terrorist activities. In particular, for "terror" and "terrorism" - a targeted approach to changing the political course of government and the specifics of the means of action - extreme cruelty to the methods of creating an atmosphere of fear. The first of them can be qualified as an necessary recognition of the concept, the second, as an adequate definition.

Historians, by staging a periodicity in the development of a terrorist fight, do not fully reveal its essence. So, at the beginning of the terror in Russia, they include the actions of D.V. Karakozova, who tried to kill in 1886 by Alexander II. Assassination of D.V. Karakozova was not a terrorist act by definition. This is an example of an assassination attempt on political life. All assassinations committed by terrorists, political actions, but not all political assassinations are terrorist acts. I remember Zh.-Zh. Rousseau: "Universal will" and "will of all" are not identical, although very similar.

P.A. Kropotkin - contemporary DV Karakozova claimed that D.V. Karakozov decided to assassinate Alexander II in 1886, when it became clear that the latter finally returned to the path of political reaction and reform. Patriotic enemies of the emperor hoped for the heir of Konstantin Nikolaevich, and to open his way to the throne could only the death of Alexander II [6, p. 235-236]. At first glance, the assassination of D.V. Karakozova can "stretch" under the content of the concept of "terror", but the second main sign, which Russian history is especially special, is the brutality of cruelty and the "path of insurance" in the actions of D.V. Karakozova was clearly absent.

The actual history of the terrorist struggle in Russia began after the campaigns of the peoples in the peasant masses and in connection with the new invasion of the reactionary government headed by Emperor Alexander II. But even then the Executive Committee of the "People's Will" tried to study the moral aspects of their actions.

In the context of the concept of "terrorist struggle", "terror" and "terrorism" are well differentiated in the dialectical interpretation of their differences as the state of contradictions, conditioned by their unity. "Terror" is a kind of terrorist struggle, which recognizes the necessity of cruelty in achieving the goal, but not its absolute value. "Terrorism" in contrast to "terror" considers cruelty and fear as absolute and inevitable means of action. The Taliban's policy after the takeover gives the government a reason to consider the Taliban as an example of a terrorist organization of the "terror" type, and IGil - an organization of the "terrorism" type. The Taliban leave a reserve of the possibility of political evolution in certain circumstances.

By defining the systemic status of terror and terrorism in the "terrorist fight", we open the reserves of a more accurate forensic definition of them. A systematic description of terrorist activities requires a comprehensive historical and legal investigation of the activities involved.

The political opposition was formed together with the development of state policy. Terror in the early period of its history was disliked in relation to the methods and means of struggle. Coming out of the archaic state, terrorism has become a modern species, taking advantage of its past purpose - the negation of the existing state and political structure, as well as the methods of means. But, as historical experience shows, terrorism even in special times - "Jacobin", "white", developing into 180, losing its active essence of the political opposition, terrorism as "quasi-terrorism" was all-selective. Terror and opposition struggles coincided until then, first of all, terrorism did not modernize its essence, removing the moral limits of the struggle. The terrorist fight was a combination of "classical" terror and terrorism,

P. A. Kropotkin testified that until 1878, ignoring the growing political aggression of the government and the personal reactionary initiatives of the tsar himself, the socialist programs of the circles of the revolutionary direction of Alexander II did not precede the new. Only "separate personalities and circles, seeing that the reign of Alexander II is fatal all the more and more immersed in the reactionary swamp, - recalled PA Kropotkin, who ate the same vague hopes for the "liberalism" of the heir (all the young heirs of the throne suspect in liberalism), insisted on the necessity to repeat Karakozov's attempt. But the organized circles were persistent against this and persistently persuaded the comrade. Now I can find out the fact that it is still unknown. A young man from the southern province came to St. Petersburg to kill Alexander II with a firm intention. Knowing about it, some Tchaikovites persuaded the young man not to do it, but as they could not persuade him, they declared that they were interfering with his strength. Knowing how poorly guarded the Winter Palace, concludes P.A. Kropotkin, I can say with

certainty that the Tchaikovs then saved Alexandra II "[6, p. 280-281].

When, after another series of brutal repressions, the mood of the revolutionary youth changed in relation to terrorist activities, that is, the organization, solving the problem of moral character, declared that the terrorist act was committed by everyone. Let us add to the text that the sacrifice of the tsar and the great princes was canceled several times for the reason of threats to the lives of their companions. The behavior of terrorists who killed Alexandra II. Rysakov wounded the tsar and several Circassians from the guard. Thus, the development of events had to be connected to Grinevitsky. In order to act for sure and inflict the minimum number of wounded returning with a parade of cadets, he waited until Alexander II, who was with him, threw an explosive device between him and himself. Another terrorist, confused, hid a bomb behind his back and began to help the wounded.

However, with the creation of the organization of the heroes of terror, a moral approach was taken. Terrorism in Russia has become a recurrence of terrorism. For Russia, this process takes place in the last two decades of the XIX century. It is understood that critically opposed opponents of our version of the distinction of terror and terrorism in the context of the development of terrorist fighting, find the facts that are not placed in it, but they will have to reconsider their arguments.

The nature of the terrorist struggle is objective. Terrorists are born and reproduced by contradictions of social progress. The essence of a terrorist fight is political. History unequivocally confirms the fact that all terrorists fight for political change, and, of course, for political power. It is important to add that the nature of the terrorist fight determines its form of expression. Terror and terrorism are unitary phenomena. Differences in them carry a subjectively conditioned, phenomenal character. No "transport", "economic", "ecological", "technological", etc. n. terrorism, there is terrorism, subjectively oriented. The difference between terrorism - in particular, the determined object, which, on the one hand, requires a specialized approach, on the other hand, warns of the danger of dividing terrorists by secondary signs, rinsing the sut. This topic we have considered carefully in one of the journal publications [14].

In multisocial phenomena there are always many different reasons for education, it is essentially a contradiction of the practical basis of social development - economic depression, defects in the policies of the state, imbalances, imbalances, mismatches. 13]. The reasons themselves can and should not be sufficient to activate terrorist activities, but they are always detected by their circumstances. Therefore, we rely on the important, outfit, to highlight the factors that led to the state of the relationship with the causal action - "active action."

Factors contributing to the arousal of terrorist acts, as well as purposefully differentiate into specific and nonspecific. The first is indirectly included in the process of terrorist activation and described by terrorists, the second is analyzed in a parallel article published. And finally: a terrorist fight, disregarding all its odiocy, is not absolutely unique in its purpose, methods and means of a political phenomenon, and can not be, being in a systemic status. It is unique in its whole expression, its separate features are unique in that or in its degree of intensity, or are capable of temporarily belonging to other forms of political struggle.

In connection with this, it is necessary to be clear and unambiguous, focusing on the history of public development, the essence of the movement, action, policy, to be determined by the composition of the subjects, capable of being terrorist organizations. However, researchers of ischemic phenomena will continue to violate the basic requirements of logical reasoning, contrary to their own claims, or historical facts. Philosophers have repeatedly warned that the process of knowing the subject at certain limits, the way out of the boundaries of which inevitably leads to subjectivism. It is impossible to change the concept, using and absolutizing certain signs of content, it is necessary to subsequently distinguish the "essence of essence" from its manifestation in politics.

It is more common for terrorists to aim at the notion of "political repression" by calling them "state terror." Political repression, it is understood, does not adorn a democratic state, but there is a need for them, caused by extraordinary circumstances, - a military attack, an international situation, an international situation. Through political repression, virtually all European states, the United States, the USSR, the People's Republic of China, and the United Kingdom, not to mention many African, South American, and Asian countries, where repression has been more objective, have always been objective.

Assaults on political leaders and public figures have long been associated with a terrorist battle. National liberation movements, guerrilla activities were accompanied by methods and means similar to terrorism, but with their help, excellent tasks were solved. "Terror" is a concept that reflects the brutality of brutal acts of violence with the aim of seizing power or forcing it to surrender. Political domination is necessary for terrorists to radically restructure historically complex architecture. We have already noted that before the transformation into terrorism, terrorist ideology did not absolutize the idea of "terror panicus", allowing certain moral restrictions on the existence of terrorist acts, as evidenced by the fact that Russia is a witness.

Subjects of terrorism: isolated personalities, the actions of which are conditionally terrorist, so as not proportional to the ultimate goals; terrorist organizations; organized terrorists inside non-terrorist organizations - the occurrence of a transitional process, temporary; consolidated terrorist organizations. Terrorism is the result of the absolutization of goals, methods, means of terrorists. Subjects of terrorism: terrorist organizations and their consolidated forms The formula of action of terrorism is quite simple: through the creation of atmospheres "terror panicus" to destroy the existing state and establish its own public order. The etymology of "terror panicus", according to A. Schopenhauer, revealed by Bacon Verulansky, corresponds to this form of insurance with the ancient deity Panom [12, p. 305].

The conclusion

General analysis of the concepts of "terrorist struggle", "terror", "terrorism" in the context of their real history and interpretation of the concepts of terrologists, two, in our view, the general problems left behind by terrorist interests. The first of them is the resilience of the reproduction of the terrorist struggle, without which it would not be possible to evolve neither terrorism into terrorism, nor terrorism out of the threat to the development of the world process. Terrorists have focused their research on what is manifested instead of looking in the "mirror" - in the essence of a terrorist fight. Special studies of the factors of the resilience of terrorism are almost non-existent, but in vain.

The second problem: the gaps in social progress between the north and the south, the west and the east are too obvious, as well as the fact that within the framework of national development the redistribution of wealth created disproportionately labor-intensive. He who is indirectly attracted to it, constantly at risk of recessions, crises, pandemics, natural cataclysms, and who participates in the intermediate growth of capital, regardless of what. In Russia there is a saying: "To whom is the war, and to whom is the mother of the native." A large part of the inhabitants of the planet feel discomfort from the conditions of life, wanting a real change, but only a small part goes to terrorists. What is this explanation? Fear before big fear? The weight is unlikely.

Healthy people value the lives of adventurous ideas and actions. Unfortunately, the persistence of common sense is relative, it is necessary to support practical resources, and adequate policy in the field of enlightenment and education. The instinct of common sense requires reinforcements in the form of persuasions built into the foundations of cultural development. Proper policy makes education the main factor in the stability of the relationship of consciousness to different types of ideological and political speculations on the contradictions.

Terrorist struggle is a political fact that should be understood and how terrorist organizations are fighting against the government and its policies, with the other side, the political essence of terrorism and

terrorism. [13-14]. The forehead in the forehead has always been volatile. Apparently, terrorists can defeat the combined forces, relying on military superiority, but not eradicate this evil. Terrorism is a means of military struggle, the essence of which is a political struggle [17, p. 273]. Judgment and general conclusion: it is necessary to improve political activity in all directions. In the first place, to deprive terrorists of the opportunity to rely on nonspecific sociocultural factors. Extremely far here is already known.

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ON THE ACTION OF A MOVING PRESSURE WAVE ON A VISCOELASTIC CYLINDRICAL SHELL INTERACTING WITH AN IDEAL FLUID

Abstract: *Statements are given, solution methods are developed, and numerical results are obtained for new problems of stationary deformation of infinitely long viscoelastic cylindrical shells on a deformable base when a non-axisymmetric normal pressure wave moves along the shell axis with up to resonant velocity. The solution methods are based on the joint application of the integral Fourier transform (or the method of fundamental solutions) along the axial coordinate and the expansion of all given and desired values in Fourier series along the angular coordinate. An efficient algorithm for the joint calculation of integrals and Fourier series has been developed and implemented on a computer. An estimate of the mixed shell is given depending on the velocity of the pressure waves and the viscosity of the materials.*

Key words: *pressure waves, cylindrical shell, viscoelasticity, resonant velocity, Fourier transform, deformable foundation.*

Language: *Russian*

О ДЕЙСТВИЕ ПОДВИЖНОЙ ВОЛНЫ ДАВЛЕНИЯ НА ВЯЗКОУПРУГУЮ ЦИЛИНДРИЧЕСКУЮ ОБОЛОЧКУ, ВЗАИМОДЕЙСТВУЮЩУЮ С ИДЕАЛЬНОЙ ЖИДКОСТЬЮ

Аннотация: *В работе даны постановки, развиты методы решения и получены численные результаты для новых задач стационарного деформирования бесконечно длинных вязкоупругих цилиндрических оболочек на деформируемом основании при движении вдоль оси оболочки не осесимметричной волны нормального давления с до резонансной скоростью. Методы решения основаны на совместном применении интегрального преобразования Фурье (или метода фундаментальных решений) по осевой координате и разложении всех заданных и искомых величин в ряды Фурье по угловой координате. Разработан и реализован на ЭВМ эффективный алгоритм совместного вычисления интегралов и рядов Фурье. Дана оценка перемещений оболочки в зависимости от скорости волн давления и вязкости материалов.*

Ключевые слова: *волны давления, цилиндрическая оболочка, вязко упругость, резонансной скорос¬ть, преобразования Фурье, деформируемой основания.*

Clarivate Analytics *indexed*

Введение

Собственные колебания и распространение свободных волн в цилиндрических оболочках, взаимодействующих с жидкостью, исследовались многими авторами, в частности в работах [1,2]. При этом рассматривались осесимметричные и не осесимметричные задачи, применялись различные модели для жидкости и оболочки. Вопрос о действии подвижной волны давления на цилиндрическую оболочку, заполненную или окруженную жидкостью, менее изучен, причем было рассмотрено только осесимметричное нагруженные [3,4]. В данном статье с помощью интегрального преобразования по осевой координате и рядов Фурье по углу получено решение задачи о движении вдоль бесконечно длинной цилиндрической оболочки, взаимо-действующей с идеальной сжимаемой жидкостью нормального давления, произвольного по длине и окружности, но неизменного во времени профиля. Скорость движения нагрузки постоянна и в подразделе она рассматривается в случае, когда она меньше скорости звука в жидкости. Жидкость заполняет полость между оболочкой радиуса a и соосной с ней жесткой цилиндрической стенкой.

Постановка задачи и основные уравнения

Рассмотрим действие не осесимметричной подвижной волны давления на вязкоупругую цилиндрическую оболочку, взаимодействующую с идеальной сжимаемой жидкостью. Уравнения движения вязкоупругого цилиндрического оболочки и идеальная жидкость вводится в системе координат r, θ, z [5]. Идеальней жидкость движется между оболочками.

Уравнения движения несущих слоев (оболочек) в перемещениях, в символической векторной – матричной форме, запишем в виде

$$L_{ij}\vec{U}_k - \int_0^t L_{ij}R_{E\text{к}}(t-\tau)\vec{U}_k(\vec{r},\tau)\,d\tau =$$
$$= \frac{(1-\nu_{0\text{к}}{}^2)}{G_{0\text{к}}h_{0\text{к}}}\vec{q}_\text{к}+$$
$$+ \rho_{0\text{к}}\frac{(1-\nu_{0\text{к}}{}^2)}{G_{0\text{к}}}\frac{\partial^2\vec{U}_k}{\partial t^2}.$$
$$(k=1,2) \quad (1)$$

Здесь индекс $k=1$ относится к внутреннему несущему слою, а $k=2$ - к внешнему слою, U_k - вектор перемещения точек срединной поверхности несущего слоя, причем для оболочек типа Тимошенко размерность вектора U_k равна пяти

$$(U_{1k}=u_k;\ U_{2k}=\vartheta_k;\ U_{3k}=w_k).$$
$$(U_{4k}=\psi_{xk};\qquad U_{5k}=\psi_{yk})$$

Здесь соответственно осевого, окружного и нормального перемещений добавляются еще углы поворота нормали к срединной поверхности в осевом и окружном направлениях: P_k - вектор

нагрузок на оболочку, размерность которого также зависит от выбранной теории оболочек. L_{ij} - матрица дифференциальных операторов теории оболочек, включающая в задачах динамики и дифференцирование по времени (члены с демпфированием и инерционные члены в развернутом виде). Если при записи уравнений движения несущих слоев учитываются деформации сдвига и инерции вращения (оболочка типа Тимошенко), тогда дифференциальные операторы имеют вид

$$L_{11}=\frac{\partial^2}{\partial z^2}+\frac{1-\nu_k}{2a_k^2}\frac{\partial^2}{\partial\theta^2}-\rho_k\frac{1-\nu_k}{2G_{k0}}\frac{\partial^2}{\partial t^2};$$

$$L_{12}=L_{21}=\frac{1+\nu_k}{2a_k}\frac{\partial^2}{\partial z\partial\theta};$$

$$L_{13}=L_{31}=\frac{\nu_k}{a_k}\frac{\partial}{\partial z};\ L_{14}=L_{15}=0;$$

$$L_{22}=\frac{1-\nu_k}{2a_k^2}\frac{\partial^2}{\partial z^2}+\frac{1}{a_k^2}\frac{\partial^2}{\partial\theta^2}-\rho_k\frac{1-\nu_k}{2G_{k0}}\frac{\partial^2}{\partial t^2};$$

$$L_{23}=\frac{1}{a_k^2}\left[1+\frac{(1-\nu_k)k_0^2}{2}\right]\frac{\partial}{\partial\theta};$$

$$L_{24}=0,\ L_{25}=\frac{(1-\nu_k)k_0^2}{2a_k},$$

$$L_{32}=\frac{1}{a_k^2}\frac{\partial}{\partial\theta};$$

$$L_{33}=-\frac{1-\nu_k}{2}k_0^2\left(\frac{\partial^2}{\partial z^2 k}+\frac{1}{a_k^2}\frac{\partial^2}{\partial\theta^2}\right)+$$
$$+\frac{1}{a_k^2}+\rho_k\frac{1-\nu_k}{2G_{k0}}\frac{\partial^2}{\partial t^2}; \qquad (2)$$

$$L_{34}=\frac{(1-\nu_k)}{2a_k}k_0^2\frac{\partial}{\partial z};\ L_{35}=-\frac{(1-\nu_k)}{2a_k}k_0^2\frac{\partial}{\partial\theta};$$

$$L_{41}=L_{42}=0;$$

$$L_{45}=L_{54}=\frac{1+\nu_k}{2a_k}\frac{\partial^2}{\partial z\partial\theta};$$

$$L_{44}=\frac{\partial^2}{\partial x^2}+\frac{1-\nu_k}{2a_k^2}\frac{\partial^2}{\partial\theta^2}-6k_0^2\frac{1-\nu_k}{h_k^2}-\rho_k\frac{1-\nu_k}{2G_k}\frac{\partial^2}{\partial t^2};$$

$$L_{51}=L_{52}=0;\ L_{53}=-6k_0^2\frac{1-\nu_k}{a_k h_k^2}\frac{\partial}{\partial\theta};$$

$$L_{55}=\frac{1-\nu_k}{2}\frac{\partial^2}{\partial z^2}+\frac{1}{a_k^2}\frac{\partial^2}{\partial\theta^2}-6k_0^2\frac{1-\nu_k}{h_k^2}-\rho_k\frac{1-\nu_k}{2G_{k0}}\frac{\partial^2}{\partial t^2};$$

$$\lambda_{0s}=\frac{2\nu_s G_{s0}}{1-2\nu_s};\ \mu_{0s}=G_{s0}$$

Здесь k_0^2 - коэффициент Тимошенко; h_k, a_k - толщина и радиус срединной поверхности несущего слоя; ν_k -коэффициент Пуассона; $R_{E\text{к}}(t-\tau)$ ядро релаксации; G_{k0}- мгновений модуль упругости.

Компоненты вектора нагрузок соответственно имеет вид

$$\{P_{1k}, P_{2k}, P_{3k}\} = -\frac{1-\nu_k}{2G_{k0}h_k}\{p_{zk} \pm q_{zk}, p_{\theta k} \pm q_{\theta k}, p_{rk} \pm q_{rk}\}$$

$$P_{4k} = -\frac{3(1-\nu_k)}{G_{k0}h_k^2}(p_{zk} \pm q_{zk});$$

$$P_{5k} = -\frac{3(1-\nu_k)}{G_k h_k^2}(p_{\theta k} \pm q_{\theta k}); \qquad (3)$$

где знак минус отвечает внутренней оболочке, а плюс - наружной: $q_{zk}, q_{\theta k}, q_{rk}$ - компоненты реакции со стороны заполнителя: $p_{zk}, p_{\theta k}, p_{rk}$ - интенсивность заданной нагрузки в соответствующем направлении. В задаче о распространении свободных волн компоненты заданной нагрузки $p_{rk}, p_{\theta k}, p_{zk}$, принимаются равными нулю.

Принимаем интегральные члены в (1) малыми. Тогда функция $\phi(t) = \psi(t)e^{-i\omega_R t}$, где $\psi(t)$-медленно меняющаяся функция времени, ω_R -действительная константа. Далее применяя процедуру замораживания [6,7], заменим соотношения (1) приближенными вида

$$\bar{L}_i^k \vec{U}_k = \frac{(1-\nu_{0к}{}^2)}{G_{0к}h_{0к}}\vec{q}_к +$$
$$+ \rho_{0к}\frac{(1-\nu_{0к}{}^2)}{G_{0к}}\frac{\partial^2 \vec{U}_k}{\partial t^2}. \qquad (4)$$

Здесь $\bar{L}_i^k[\varphi(t)] = L_{ij}^k(1 - (R_{ij}^k\delta_{ij})^{-1})[\varphi(t)]$ δ_{ij} -символы Кронекера, $R_{ij}^k(R_{11}^k = R_{22}^k = R_{33}^k = \bar{G}_k[\varphi(t)])$ -диагональная матрица третьего порядка для гипотезы Кирхгофа-Лява, а для гипотезы Тимошенко- пятого порядка. Система дифференциальных уравнений (4) решается при граничных условиях. Не осесимметрично движение оболочки типа Тимошенко описывается уравнениями (1), и (4) причем в компонентах вектора нагрузок отличен от нуля лишь член [8] $p_{3k} = -\frac{1-\nu_k}{2G_k h_k}(q_{rk} \mp p_{rk})$. Также движение идеальной сжимаемой жидкости описывается волновым уравнением

$$\frac{\partial^2 \varphi}{\partial r^2} + \frac{1}{r}\frac{\partial \varphi}{\partial r} + \frac{1}{r^2}\frac{\partial^2 \varphi}{\partial \theta^2} + \frac{\partial^2 \varphi}{\partial x^2} = \frac{1}{c_1^2}\frac{\partial^2 \varphi}{\partial t^2}.$$

где φ - потенциал скоростей жидкости; c_1- акустическая скорость звука в жидкости; ρ_0 - плотность жидкости. Задача сводится к совместному интегрированию уравнений (1), (4) и (5) при выполнении граничных условий непроницаемости оболочки и жесткой стенки

$$\left|\frac{d\varphi}{dr}\right|_{r=a} = \frac{\partial w_k}{\partial t}; \qquad \left|\frac{d\varphi}{dr}\right|_{r=b} = 0. \qquad (6)$$

При этом входящее в (3) давление со стороны жидкости выражается через потенциал скоростей по формуле

$$q_{rk} = -\rho_0 \left|\frac{\partial \varphi}{\partial t}\right|_{r=a}. \qquad (7)$$

Рассматривая установившийся процесс, переходим в уравнениях движения оболочки и жидкости к системе координат.

Методы решения

При рассмотрении устанавливающие процесса применяются преобразование Галилея [9]

$$\eta = (x - ct)/H, \qquad (8)$$

где c- скорость движения нагрузки, Н-некоторая характерная в рассматриваемой задаче величина, имеющая размерность длины ($H = a$). Применяем преобразование Фурье по η [10]:

$$\varphi^{(0)}(\zeta) = \int_{-\infty}^{\infty} \varphi(\eta) e^{-i\zeta\eta} d\eta;$$
$$\varphi(\eta) = \int_{-\infty}^{\infty} \varphi^{(0)}(\zeta)\varphi(\eta) e^{i\zeta\eta} d\zeta. \qquad (9)$$

Здесь ζ- параметр преобразования Фурье. В пространстве изображении решение преобразованных уравнений ищется в виде рядов Фурье по угловой координате θ. Предполагая, что трансформанты заданной нормальной нагрузки и давления жидкости разложимы в ряды Фурье по θ.

$$\{u_k^{(0)}, w_k^{(0)}, \psi_{xk}^{(0)}, p_{rk}^{(0)}, q_{rk}^{(0)}\} =$$

$$= \sum_{n=0}^{\infty}\{u_{nk}^{(0)}, w_{nk}^{(0)}, \psi_{xnk}^{(0)}, p_{rnk}^{(0)}, q_{rnk}^{(0)}\}\cos(n\theta);$$
$$\{v_k^{(0)}, \psi_{yk}^{(0)}\} = \sum_{n=1}^{\infty}\{v_{nk}^{(0)}, \psi_{ynk}^{(0)}\}\sin(n\theta), \quad (10)$$

где n-число гармоник по угловой координате.

Подставляя (10) в преобразованные уравнения движения оболочки, получаем систему алгебраических уравнений для коэффициентов Фурье трансформант перемещений срединной поверхности. В этой системе неизвестными являются коэффициенты разложения давления жидкости, которые должны быть выражены через коэффициенты нормального перемещения оболочки. Представляя трансформанту потенциала скоростей в виде (10) и подставляя в преобразованное уравнение (1), приходим к уравнению

$$\frac{\partial^2 \varphi_n^{(0)}}{\partial r_*^2} + \frac{1}{r_*}\frac{\partial \varphi_n^{(0)}}{\partial r_*} - \left[\frac{n^2}{r_*^2} + [1 - M^2]\zeta^2\right]\varphi_n^{(0)} = 0, \quad (11)$$

где $M = \frac{c}{c_1}$ - число Маха, c_1- акустическая скорость звука в жидкости. Решение уравнения (11) при дозвуковом режиме движения $c < c_1$ имеет вид [11]:

$$\varphi_n^{(0)} = A_n(\xi)K_n(\beta\xi r_*) + B_n(\xi)I_n(\beta\xi r_*),$$

где $\beta = \sqrt{1 - M^2}$.

Подставляя (11) в (2), (3) находим связь между реакцией жидкости и нормальным перемещением оболочки

$$q_{r.nk}^0 = \rho_0 c^2 k\xi^2 f_k(\xi, n, c)\frac{w_{nk}^0}{h_k}, \qquad (12)$$

где для $c < c_1$

$$f_k(\xi, n, c) = \frac{ns_4 - \beta\xi\varepsilon - (ns_2 + \beta\xi\varepsilon s_3)s_5}{(n + \beta\xi s_1)(ns_4 - \beta\xi\varepsilon) - (ns_2 + \beta\xi\varepsilon s_3)(ns_5 - \beta\xi s_6)}; (13)$$

$$s_1 = \frac{I_{n+1}(\beta\xi)}{I_n(\beta\xi)}; \quad s_2 = \frac{I_n(\beta\xi\varepsilon)}{I_n(\beta\xi)};$$

$$s_3 = \frac{I_{n+1}(\beta\xi\varepsilon)}{I_n(\beta\xi)}; \quad s_4 = \frac{I_n(\beta\xi\varepsilon)}{I_{n+1}(\beta\xi\varepsilon)};$$

$$s_5 = \frac{K_n(\beta\xi)}{K_{n+1}(\beta\xi\varepsilon)}; \quad s_6 = \frac{K_{n+1}(\beta\xi\varepsilon)}{K_n(\beta\xi\varepsilon)},$$

где $\varepsilon = b/a$, $I_{n+1}(\beta\xi)$ и $K_n(\beta\xi)$- модифицирование функции Бесселя 1-го и 2-го рода, $f_k(\xi, n, c)$-при к=1,2 отличается толка с противоположности знаками.

Если оболочка полностью заполнена жидкостью, то формула (13) принимает вид
$$f_k(\xi, n, c) = \delta_k(n + \beta\xi s_1)^{-1},$$
$$\delta_k = \{к = 1, \delta_1 = 1; к = 2, \delta_1 = -1\}. \quad (14)$$

Подставляя найденную связь (12) в систему алгебраических уравнений для определения коэффициентов разложения трансформант перемещений оболочки, находим
$$\{u_{nk}^{(0)}, v_{nk}^{(0)}, w_{nk}^{(0)}, \psi_{xnk}^{(0)}, \psi_{ynk}^{(0)}\} =$$
$$-\frac{1-v_k}{2G_k k^2} p_{z,nk} \frac{\{\Delta_{1k}, \Delta_{2k}, \Delta_{3k}, \Delta_{4k}, \Delta_{5k}\}}{\Gamma_{E1}\det_n\|a_{\bar{k}l}\|}, (\bar{k}, l = 1, \dots, 5) \quad (15)$$

Элементы определителей $\det_n\|a_{kl}\|$ вычисляются по формулам

$$a_{11k} = -\left(1 - \frac{1-v_k}{3}c_{0k}^2\right)\xi^2 - \frac{1-v_k}{3}n^2;$$

$$a_{12k} = -a_{21k} = a_{45k} = -a_{54} = i\xi\frac{1+v_k}{2}n;$$

$$a_{13k} = a_{31k} = i\xi v_k;$$

$$a_{22k} = -\frac{1-v_k}{2}\left(1 - \frac{2}{3}c_{0k}^2\right)\xi^2 - n^2;$$

$$a_{23k} = -\frac{2+(1+v_k)k_{0k}^2}{2}n; \quad (16)$$

$$a_{25k} = k^{-1}; \quad a_{32k} = n;$$

$$a_{33k} = 1 + k_{0k}^2\frac{1-v_k}{2}(n^2 + \xi^2) - \frac{1-v_k}{3}c_{0k}^2\xi^2 x$$

$$x\left[1 + \frac{\rho_{0k}^*}{k}f_k(\xi, n, c)\right]$$

$$a_{34k} = -i\xi k_{0k}^2\frac{1-v_k}{2k}; \quad a_{35k} = -k_{0k}^2\frac{1-v_k}{2k}\frac{n}{k};$$

$$a_{43k} = 12a_{34k}; \quad a_{44k} = a_{11k} - 6(1 - v_k)\frac{k_{0k}^2}{k^2};$$

$$a_{53k} = -12a_{35k}; \quad a_{55k} = a_{22k} - 6(1 - v)\frac{k_{0k}^2}{k^2};$$

$$a_{14k} = a_{15k} = a_{24k} = a_{41k} = a_{12k} = a_{51k} = a_{52k} = 0;$$

$$\rho_{0k}^* = \frac{\rho_0}{\rho_k}; \quad c_{0k} = c^{(\frac{3\rho_k}{2G_k})}$$

$$\Gamma_{E1} = 1 - \Gamma_{E1}^C(\omega_R) - i\Gamma_{E1}^S(\omega_R),$$

$$\Gamma_E{}^C(\omega_R) = \int_0^\infty R_E(\tau)\cos\omega_R\tau\, d\tau; \quad \Gamma_E{}^S(\omega_R) =$$
$$= \int_0^\infty R_E(\tau)\sin\omega_R\tau\, d\tau$$

где $R_E(\tau)$- ядро релаксации.

Определители $\Delta_{jk}(j = 1, \dots, 5)$ получаются из $\det_n\|a_{kl}\|$ заменой j-го столбцом с элементами{0,0,1,0,0}. Подставляя (15) в формулу

(12), находим коэффициенты Фурье трансформанты давления жидкости
$$q_{r,nk}^0 = -\frac{1-v}{3}\frac{\rho_{0k}^* c_0^2}{k}\xi^2 f_k(\xi, n, c)\frac{\Delta_{3k}}{\Gamma_{E1}\det_n\|a_{kl}\|}p_{r,nk}^0 \quad (17)$$

Для изгибающего момента и поперечной силы в оболочке получаем
$$M_{x,nk}^0 = -\frac{h_k a}{12}p_{r,nk}^0\frac{i\xi\Delta_{4k}nv_k\Delta_{5k}}{\Gamma_{E1}\det_n\|a_{\bar{k}l}\|}; \quad (18)$$

$$Q_{x,nk}^0 = -\frac{(1-v_k)k_{0k}^5}{2k}ap_{r,nk}^0\frac{i\xi\Delta_{4k}nv_k\Delta_{5k}}{\Gamma_{E1}\det_n\|a_{\bar{k}l}\|}. \quad (19)$$

Теперь рассмотрим примеры. Окончательное решение получается подстановкой (15) - (19) в ряды Фурье и применением обратного преобразования Фурье. В качестве примера рассмотрено, когда жидкость находится между оболочкой радиуса b и соосной жесткой цилиндрической стенкой радиуса a.

Внешних нагрузок принято в виде [12]:
$$p_r(\eta, \theta) = p_2\exp(a\eta)H(-\eta)\sum_{k=1}^l(\theta - \theta_k), \quad (20)$$
$H(x)$-функции Хэвисайда. В этом случае
$$p_{r,nk}^0 = \frac{p_2 a_{nk}}{a - i\xi}. \quad (21)$$

Здесь a_n - коэффициенты Фурье функции $\sum_{k=1}^l(\theta - \theta_k)$. Если принять $p_2 = 2\pi p_1/l$. где p_1 - интенсивность движутся нагрузки, $q^* = q_r/p_1$

$$w_1^* = \frac{wG_1\Gamma_{E1}}{p_1 a} -$$
$$\frac{1-v_1}{kl}\sum_{n=0}^\infty\left\{\int_{-\infty}^\infty\frac{\Delta_{31}[a\cos(\xi\eta)-\xi\sin(\xi\eta)]}{\Gamma_{E1}(a^2+\xi^2)\det\|a_{\bar{k}l}\|}d\zeta\right\}a_n\cos(n\theta);$$
$$(22)$$

$$q^* = -\frac{2(1-v)p_{01}^* c_0^2}{3kl}$$
$$\sum_{n=0}^\infty\left\{\iint_{-\infty}^\infty\frac{f(\xi,n,c)\xi^2\Delta_{31}[a\cos(\xi\eta)-\xi\sin(\xi\eta)]}{\Gamma_{E1}(a^2+\xi^2)\det\|a_{\bar{k}l}\|}d\zeta\right\}\cdot\cdot$$
$$a_n\cos(n\theta). \quad (23)$$

Аналогично с использованием (22) и (23) можно записать формулы для M_x, Q_x вычисления несобственных интегралов (22) и (23) использоваться следующий алгоритма основанного на методе Ромберга[13,14].

Алгоритм вычисления

Величина w_1^* и q^*из (22) и (23) вычисляется на ЭВМ следующим образом. Задаются все числовые параметры, необходимые для вычислений.

Для вычисления интеграла (22) под несобственного интегрального функцию обозначается через $\chi_1(r_0, \Omega, t) = \frac{\Delta_{31}[a\cos(\xi\eta)-\xi\sin(\xi\eta)]}{(a^2+\xi^2)\Gamma_{E1}\det\|a_{\bar{k}l}\|}$. Над этим функции проводится следующие элементарные преобразования
$$\chi_1(r_0, \Omega, t) = (\Delta_1(r_0, \Omega)/\Omega(\Delta_2\Delta_3 + \Delta_4\Delta_5))e^{i\Omega t} \quad (24)$$
можно численно интегрировать, записав ее в виде
$$\chi_1(r_0, \Omega, t) = x_1(r_0, \Omega, t) - i x_2(r_0, \Omega, t). \quad (25)$$

Падающий импульс w_1^* описывается выражением

$$w_1^*(\Omega, t) = f_1(\Omega, t) - i\, f_2(\Omega, t),$$

где $f_1(\Omega, t)$, $f_2(\Omega, t)$- вещественные функции. Использовав формулу Эйлера для $\ell xp(i\Omega t)$, разделив на вещественную и мнимую (25) части, после некоторых преобразований получим

$$w_1^* = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} [x_1(\Omega, t) - ix_2(\Omega, t)]d\Omega \quad (26)$$

Разделив интеграл (16) на два слагаемых

$$w_1^* = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{0} [x_1(\Omega, t) - ix_2(\Omega, t)]d\Omega +$$
$$+ \frac{1}{\sqrt{2\pi}} \int_{0}^{\infty} [x_1(\Omega, t) - ix_2(\Omega, t)]d\Omega \quad (27)$$

и заменив в первом интеграле переменную Ω на $-\Omega$, будем иметь

$$w_1^* = \frac{1}{\sqrt{2\pi}} \int_{0}^{\infty} [x_1(\Omega, t) - x_1(-\Omega, t)] - -i[x_2(\Omega, t) - x_2(-\Omega, t)]d\Omega \ . \quad (28)$$

Поскольку (28) представляет собой обратное преобразование Фурье и в левой части содержит вещественную величину [13], то справедливо соотношение

$$x_1(\Omega, t) = -x_1(-\Omega, t)\, ; x_2(\Omega, t) = -x_2(-\Omega, t). (29)$$

Учитывая его, из (29) окончательно получаем

$$w_1^* = \frac{\sqrt{2}}{\pi} \int_{\omega_a}^{\omega_b} [x_1(\Omega, t) + i\, x_2(\Omega, t)]d\Omega. \quad (30)$$

Величину интеграла (30) найдем численно с помощью метода Ромберга [13]. Основной алгоритм этого метода приведен в первой главе. При вычислении интеграла по методу Ромберга приходится многократно вычислять подынтегральную функцию. Обратное преобразование Фурье для некоторого изображения, оригинал которого заранее известен, показало, что при длине шага интегрирования 0,01 погрешность процедуры не превышает 0,3-0,5%.

Для системы без демпфирования предварительно должна быть определена первая резонансная скорость путем построения дисперсионных кривых для различного числа волн в окружном направлении.

Численные результаты.

Расчеты проведены для стальной оболочки, взаимодействующей со слоем воды. При этом принимались следующие значения параметров:

$$k = \sqrt{2/3}\, , k = 0.005, \in = 0.45, \nu_1 = 0.25, a = 1.0,$$
$$\rho_0^* = 0.13, c_0 = 0.1, M = 1.66.$$

Табл.1.

l	θ										
	0	$\frac{\pi}{10l}$	$\frac{\pi}{5l}$	$\frac{3\pi}{10l}$	$\frac{2\pi}{5l}$	$\frac{\pi}{2l}$	$\frac{3\pi}{5l}$	$\frac{7\pi}{10l}$	$\frac{4\pi}{5l}$	$\frac{9\pi}{10l}$	$\frac{\pi}{l}$
2	-9.96	-7.64	3.53	-3.43	1.92	-1.63	0.41	0.019	-1.00	1.12	-1.54
4	-6.12	-6.19	-3.04	-0.39	1.29	0.08	-1.47	-0.61	1.21	-0.11	-1.70
6	-4.75	-4.18	-2.91	-1.72	-0.92	-0.31	0.25	0.47	0.04	-0.74	-1.13
8	-2.95	-2.44	-2.74	-1.78	-1.03	-0.59	-0.53	-0.42	-0.21	-0.02	-0.07

В качестве примера вязкоупругого материала примем трех параметрических ядро релаксации:

$$R_\lambda(t) = R_\mu(t) = A e^{-\beta t}/t^{1-\alpha}, \nu = 0.25,$$
$$A = 0{,}048; \quad \beta = 0{,}05; \quad \alpha = 0{,}1.$$

Все результаты получено в безразмерных параметрах.

В табл.1. приведено распределение по угловой координате давления жидкости на оболочку q^* в сечении $\eta = 0.5$ для различного числа самоуравновешенных сил.
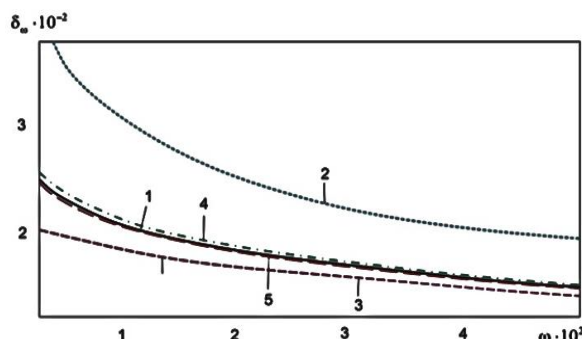

Рисунок 1. Изменение мнимой части радиального перемещения в зависимости от скорости при различных параметритах вязкости. 1.A=0.01, 2. A=0.005, 3. A=0.02, 4. A=0.015. 5. A=0.017

Из таблицы видно, что самая болящая давления жидкости является при $\theta = 0^0$. С увеличениями углов $0 \le \theta \le \pi/l$ давления движущейся нагрузка, оказывающие на оболочку умещается. Изменение мнимой части радиального перемещения в зависимости от скорости, движущейся давления при различных параметритах вязкости приведена на рисунке 1. Видно, что с увеличений скорости перемешенные оболочки экспоненциально снижается.

Заключение

1. Предложена математическая постановка и методы решение задачи, когда движущая жидкость с постоянной скоростью находится между вязкоупругой оболочкой и соосной жесткой цилиндрической стенкой.

2.Разработана алгоритма для вычисления несобственных интегралов с высокой точностью.

3. Учет вязкой свойства оболочки на увеличивает перемежении до 12-16%. Перемешенные и силовые фактории оболочки с увеличений скорости жидкости плавно уменьшается.

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DEVELOPMENT OF PRODUCTION STRATEGIES FOR DEMAND AND COMPETITIVE PRODUCTS FOR CONSUMERS OF UFO AND SKFO REGIONS

Abstract: in the article the authors motivate the manufacturer to recommend the market at the expense of its motivation, manage quality, produce for the consumer the import-substituting product, reconsider its concept of market formation by formulating the market Such mutual understanding in full measure will correspond to the desire of the consumer to satisfy his desire to make a purchase with the account of his social status, to provide the producers with the realization of the expected production of the finished product. In addition, the authors have highlighted the need for a high level of political responsibility for the results of the management of the enterprise. Personification of responsibility does not mean just search for it, who answers for everything. It is important to understand that the personification of responsibility implies its delegation to obtain the desired result. And here it is important not to allow a serious methodological error - economic policy to bring to the economic analysis, and to support the team in the spirit of solidarity - one for all and all for one - and will definitely find success.

Key words: quality, import substitution, demand, competitiveness, market, profit, demand, buyer, producer, financial stability, sustainable TEP, privilege, assortment, team management, assortment policy, ecological policy, assortment, assortment policy.

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Introduction

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In recent years, the existing system of industrial prices has undergone significant changes. In the process of improving production processes in European shoe factories, the rate on intellectual resources is significantly increased. Guarantees of success are not the size of the enterprise and capital, but ingenuity and creativity, the use of computer capabilities, marketing, the latest management methods and the ability to quickly respond to changes in the world market. Therefore, the authors tried to present their vision of the crisis in the domestic shoe industry, to ensure demand for the products of UFO and SKFO and to create preconditions for its competitiveness. Such a decision is not deliberately taken into account in the transfer of production footwear to other countries (using outsourcing), and for the formation of large aggregates within clusters. It is possible under the conditions of interest of all branches of government to create additional working places, to reduce the number of unemployed with the actual softening of tension and without such explosive and dangerous regions. After all, no one has canceled the old truth: want to know whether a person is well dressed, look at his feet, but to have such a desire in a person, it is necessary to provide satisfaction for his needs in this particular clothing and wear them production of modern assortment of competitive products. Practically all experts agree that in the conditions of the international competition of the next century, their positions are not the largest, but the most successful in the flexibility of shoe enterprises. It is possible under the conditions of interest of all branches of government to create additional working places, to reduce the number of unemployed with the actual softening of tension and without such explosive and dangerous regions. After all, no one has canceled the old truth: want to know whether a person is well dressed, look at his feet, but to have such a desire in a person, it is necessary to provide satisfaction for his needs in this particular clothing and wear them production of modern assortment of competitive products. Practically all experts agree that in the conditions of the international competition of the next century, their positions are not the largest, but the most successful in the flexibility of shoe enterprises. It is possible under the conditions of interest of all branches of government to create additional working places, to reduce the number of unemployed with the actual softening of tension and without such explosive and dangerous regions. After all, no one has canceled the old truth: want to know whether a person is well dressed, look at his feet, but to have such a desire in a person, it is necessary to provide satisfaction for his needs in this particular clothing and wear them production of modern assortment of competitive

products. Practically all experts agree that in the conditions of the international competition of the next century, their positions are not the largest, but the most successful in the flexibility of shoe enterprises. reduction of the number of unemployed with substantial softening of the tension and without the explosive regions of UFO and SKFO. After all, no one has canceled the old truth: want to know whether a person is well dressed, look at his feet, but to have such a desire in a person, it is necessary to provide satisfaction for his needs in this particular clothing and wear them production of modern assortment of competitive products. Practically all experts agree that in the conditions of the international competition of the next century, their positions are not the largest, but the most successful in the flexibility of shoe enterprises. reduction of the number of unemployed with the actual softening of the tension and without the explosive regions of UFO and SKFO. After all, no one has canceled the old truth: want to know whether a person is well dressed, look at his feet, but to have such a desire in a person, you need to meet the satisfaction of his needs in this particular clothing and wear them; production of modern assortment of competitive products. Practically all experts agree that in the conditions of the international competition of the next century, their positions are not the largest, but the most successful in the flexibility of shoe enterprises. and to have such a desire in a person, it is necessary to ensure the satisfaction of his needs in this particular clothing and footwear, taking into account his preferences and realizing them at the expense of the production of a modern assortment of competitive products. Practically all experts agree that in the conditions of the international competition of the next century, their positions are not the largest, but the most successful in the flexibility of shoe enterprises. and to have such a desire in a person, it is necessary to ensure the satisfaction of his needs in this particular clothing and footwear, taking into account his preferences and realizing them at the expense of the production of a modern assortment of competitive products. Practically all experts agree that in the conditions of the international competition of the next century, their positions are not the largest, but the most successful in the flexibility of shoe enterprises.

According to the Institute of Commodity Research and the conjuncture of the wholesale market, domestic production in Russia in 2020. decreased to 55.6 mln. par. In the context of the global economic crisis, this can lead to a deficit in some price categories. Obviously, in the general consumption of Russia within the limits of 540÷580 million pair of shoes in the year before the Russian enterprises there are problems of expansion of production volumes. The current exchange rate of the dollar in relation to the ruble is due to the further increase in the price of foreign shoe production. It is then that Russian

manufacturers, who produce quality and fashionable shoes, can calculate the new markets in Russia and the new layers of buyers. Evidence of this is the fact that many large Russian trading companies have partially or completely gone into production and trade in domestic footwear. Reliable phenomena, though subtle, but manifest themselves directly in the shoe market. So, in 2020. there was a definite stabilization of sales of products through trade organizations. In the opinion of the majority of specialists, This is due to the reorientation of the population to the purchase of shoes in stores, where the guarantee of quality is higher than in the "wholesale". In Russia, a new consumer standard is clearly being formed, in which cheap, private shoes can and will not find its buyer. By the way, it is manifested in the fact that the unspeakable trust of the Russians in imports has significantly increased. This gives some chance to domestic producers, to the extreme, to push the usurping sector of cheap boots of Asian competitors to the fullest. It is important to remember that the orientation is exclusively on the production of inexpensive products of mass demand in the conditions of a saturated market fragile crisis. Prospects of Russian manufacturers are connected, first of all, with buyers, ready to pay a little more for guaranteed quality and compatible fashion. Everyone is talking about the fact that this shopping group will expand in our country faster than others. In the new conditions, the economy is progressive, only such production, which actively and dynamically reacts to the emerging tasks. The principle of "produce only what is needed, then, when it is needed, and so on, how much is needed" requires the adaptation of footwear enterprises to the conditions of production of small parties with a partial change in the range of footwear. to the conditions of a wide range of small-scale production. The efficiency of the shoe business, and in many respects and the ability to survive in a competitive struggle, depends on the ability to shorten the time and with minimal costs to recover on the issue of shoe wear and tear.

Technological and organizational flexibility of production systems determines the variable potential of enterprises, their ability to respond quickly and adequately to changes in market conditions and acts as a mechanism for optimizing the structure of technological structures. Thus, the development of flexible technological processes for the production of leather products ensures high efficiency in a wide range of shoe production and provokes a sharp increase in demand for the products of shoe factories. The authors describe the structure of the range of footwear manufacturers of the region by species, materials, season socks, price levels, with the purpose of analyzing the market situation, which allowed to find those types of footwear that will be used. Formed their aesthetic and constructive characteristics.

Developed by the authors of the elements of the expert system of operational management with a wide range of issues, allow to calculate the optimal structure of the range of issued footwear and determine the total cost of the entire issue.

Theoretical dependencies for the assessment of the impact of the factor "organization of production" on individual articles of the calculation as a whole and other technical and economic indicators were obtained. This analysis and determination of the impact of the form of organization of production and technology of production on self-sufficiency in the example of the technological process of production of children's, men's and women's shoes with the accounting of the shift program. Developed recommendations for the calculation of the specific weight of the cost of the article in the preparation of a wide range of issues with the possibility of forecasting the cost and volume of sales of products with the request of the shoe on the shoe.

Developed functional and simulation models of business processes of production of leather, received a formal description of the organization of the existing technological process and the results of the evaluation of the effectiveness of the latest technological processes. Developed a method of multidisciplinary assessment of the effectiveness of innovative technological processes of production of leather products on the basis of the application of the methodology of whole programming. Developed software support for the formation of the technological process of assembling shoes and determining the cost of production of the range of shoes. A computer simulation model describing the dynamics of the process of assembling shoes is implemented.

Comprehensive indicators of the effectiveness of innovative technological processes in the manufacture of shoes. С учётом производственной программы сформированы перспективные варианты технологии и оборудования, выбран наиболее эффективный, выявлены возможности рационализации потока, позволяющие исключить "узкие" места, минимизировать простои оборудования, что является одним из условий проектирования гибких технологических процессов, но производство обуви с востребованной ценовой нишей. The economic effect of the results of scientific research, which are evaluated in terms of increasing labor productivity, the level of mechanization of production, the reduction of indicators of unregulated production. An available tool for technologists in the production of footwear to improve the design of technological processes, allowing the enterprise to form a competitive assortment and forecast the maximum amount of income from the production of footwear for the regions of UFO and SKFO. The authors support the idea of creating in the UFO and SKFO vertically

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integrated units (TORs), which were engaged in a whole cycle of production footwear from ready-made shoes and accompanying accessories. This allows you to improve quality control, reduce waste, increase profit, diversify the price niche, ensure domestic competitiveness and sustainability of the product, and the residents of the region - UFO and SFU. The authors support the idea of creating in the UFO and SKFO vertically integrated units (TORs), which were engaged in a whole cycle of production footwear from ready-made shoes and accompanying accessories. This allows you to improve quality control, reduce waste, increase profit, diversify the price niche, ensure domestic competitiveness and sustainability of the product, and the residents of the region - UFO and SFU. The authors support the idea of creating in the UFO and SKFO vertically integrated units (TORs), which were engaged in a whole cycle of production footwear from ready-made shoes and accompanying accessories. This allows you to improve quality control, reduce waste, increase profit, diversify the price niche, ensure domestic competitiveness and sustainability of the product, and the residents of the region - UFO and SFU.

We believe that the results of the analysis of the state of the shoe industry presented by the authors will help industry representatives in choosing an effective solution for the implementation of the development strategy not only of the shoe industry, but also of other light industries in the mining single-industry towns of the Rostov region in order to reduce the migration of the population of these cities and create population social conditions for living. This will be our postal contribution to the restoration of the shoe industry in the regions of UFO and SKFO.

The main part

The transition to a market economy in Russia has put a number of problems in front of enterprises in the light industry, the main of which are unusual adaptations to their conditions of increasing competition, the reduction of the market is caused by the rapid growth of profits. financial resources. At the same time, modern productions to ensure the survival of the enterprise must have a number of special qualities: greater flexibility, the ability to quickly change the range.

Production, incompetent to resent, to adapt to requests for real conditions, often a small group of consumers, doomed to bankruptcy; technology complicates the table that requires the introduction of new forms of control, organization and division of labor. Sophisticated planning on the principle of "out of reach" is unacceptable, although it is necessary to sharply increase the competitiveness of products; changes the structure of the cost of production, while due to the difficulties with the suppliers of raw materials, the material increases the specific weight of material losses associated with the sale; The big

problem is the increase in the efficiency of the enterprise to increase production. It is necessary to pay special attention to the acceleration of turnover of working capital, reduction of surplus stocks, maximum rapid sales of products.

The Russian economy should have the opportunity to develop dynamically on the basis of its own internal resources. For such restructuring of the Russian industry it is necessary to invest, which at the present time is not enough. One of the most common ways to attract additional funds is to obtain a bank loan. However, a similar form is not the only one. One of the alternative options for financing an organization is leasing.

Leasing is a form of investment of funds on a repayable basis, ie. provision for a specified period of time that the lessee receives back within the established time. At the same time, the lessee for its services is rewarded in the form of commissions.

The lessor provides the lessee with financial services, acquiring the property of the manufacturer (seller) for the full cost of ownership, and the lessee carries out this cost with periodic interest payments.

Leasing is a loan that differs from a traditional bank loan in that it is provided by the lessor to the lessee in the form of transfer to the use of property, ie. own kind of commodity credit.

In connection with this, a comparative analysis of the purchase of equipment for the loan account or by obtaining it in the leasing is provided below.

The bank begins the procedure for issuing a loan by reviewing applications, and most banks are required to pledge the property already owned by the enterprise. With this amount of credit will depend on the value of this property. The bank evaluates the property of the enterprise not at market value, and for that, for which it can sell collateral in the shortest possible time. Correspondingly, the value of the collateral will be strongly depreciated.

When leasing an enterprise, the lessee receives the necessary equipment and begins to operate it, but at the same time it remains the property of the leasing company. At the same time, the leasing company pays its obligations step by step to buy a new property in the company, ie. how to rent equipment. For this reason, in the case of leasing, no collateral or excellent credit reputation is required - the leased equipment purchased remains in the possession of the lessee until that time, while the enterprise-lessee is not a full-fledged lessee.

In addition, in contrast to banks, which issue loans (especially to small businesses) for a period of about five years, leasing companies can significantly increase the repayment period. Depending on the company's purchases, they allow themselves to expand the framework for up to 10 years.

Leasing provides an opportunity for the lessee to use the property in the course of entrepreneurial activity and, consequently, to acquire the right to own

it. Leasing agreements can provide for the accounting of property as on the balance sheet of the lessor, as well as the lessee.

The buyer of equipment on credit has the opportunity to carry the cost of property on the basis of depreciation, but the interest on the loan, accrued after the appraisal of property, the value of the property does not include the property itself. Leasing recipients in the event of accounting for property on the balance sheet of the lessee have the opportunity to include in the self-sufficiency of lease payments, which ensures the transfer to the self-sufficiency of the property, the property is an important consideration. This option, unlike purchases, also allows you to include interest on borrowings, which are included in the amount of the lease payment.

The leasing option, taking into account the property on the lessee's balance sheet, also allows you to transfer the cost of equipment to the cost price in a shorter time by means of depreciation due to the use of an increasing coefficient to depreciation rates, as well as to include in the cost the cost of interest on borrowed funds.

Expenditures on construction and installation work, in any way, the purchase of equipment could be transferred to self-sufficiency, however, in the case of leasing, it can be done in a very short time - in a very short time. - at the end of the depreciation period of the equipment with the calculation of the coefficient of increase).

Expenditures on the implementation of construction and installation work in the case of acquisition of property for the credit account will be included in the cost of the OS and will be carried out at cost. However, similar costs in the case of leasing, rather than everything, can not be learned when determining the profit.

The tax on the added cost of the principal difference between the considered options is not, as

the tax, paid as in the case of leasing, so and in the case of purchase of equipment, is deducted. However, the lease provides the possibility of a fairly equal amount of VAT, paid as part of the lease payment, at the same time as the acquisition of the OS under the contract.

The obligation to pay the tax on property is imposed on that person, on whose balance the property is located. Thus, the tax on the value of property is paid by the buyer after the transfer to him of the right of ownership, as well as the lessee, studying the property in accordance with the terms of the lease agreement on its own.

Leasing is possible with a flexible payment schedule in line with production cycles and cash flows. When calculating lease payments, the leasing company usually takes into account the financial condition of the lessee. If it is small or only an educated enterprise or for the introduction of equipment in effect requires a long time, then the parties to the lease, more often, set the payment to increase. That is, the value of individual payments under the lease agreement will increase from time to time, which will allow the lessee to fulfill their obligations in return, even if the funds are required for the initial stage of the lease.

In the case of leasing, there is also the fact that if the leasing company is a wholesale buyer of equipment (which is practically always), it receives a corresponding discount. And the lower the price, the lower and the cost of leasing this equipment. Naturally, a company or enterprise that buys equipment only once can not get such discounts. The same lessee is interested in finding the right equipment at the lowest possible price, so it gives him the advantage over competitors. Distinctive features of the use of credit and leasing mechanisms are given in Table 1.

Table 1. Distinctive features of the use of credit and leasing payments

Credit	Leasing
Investments are directed to any entrepreneurial activity	Investments are directed to the activation of production activity, development and modernization of capabilities.
Control over the intended use of means is difficult due to the lack of effective tools	Guaranteed control over the intended use of the funds, as in leasing is given a specific contracted property
Need a 100% guarantee of loan repayment and interest for its use	The size of the guarantee is reduced to the cost of the leased property, which itself is a guarantee
Acquired property is reflected in the balance sheet of the enterprise, it is depreciated	Property is reflected on the balance sheet of the lessee or enterprise-lessee; accelerated depreciation is calculated
The fee for the loan is covered by the account of the enterprises received income, on which all pre-assessed taxes are accrued	Leasing payments (included in the cost of production) reduce the taxable base and stimulate the development of production

Thus, in the current situation, when many enterprises are not able to invest large financial

resources in technical upgrades and intensification of production, leasing is the most effective way of organizing the organization.

UFO and SKFO have a large number of leasing companies or branches of leasing companies (Table 2).

Table 2. List of existing leasing organizations in UFO and SKFO in 2021

The name of the company	The volume of new business in million rubles without VAT	Quantity leasing beneficiaries
1	2	3
Gaztechleasing LLC	2452.21	6
LK URALSIB LLC	3791,92449	87
Europlan	2279.00	1011
CARCADE Leasing	1481.22	1376
Element Leasing LLC	1147.41	466
Raiffeisen-Leasing LLC	1046.68	9
OJSC "GLAVLIZING"	1006,13	27
LLC "Interleasing"	789.90	89
Scania Leasing LLC	740.00	n.d.
GK KAMAZ-LEASING	728.59	42
LLC "RMB-LEASING"	626,16	19
CJSC "Bear Leasing Company"	421.05	32
CJSC "Client Leasing Company"	367.89	29
UniCredit Leasing LLC	350.52	15
LLC "FB-LEASING"	309.72	84
NOMOS-Leasing	296.38	81
JSC "TRUCK-LEASING"	223.08	48
JSC "Halyk-Leasing"	204.10	1
LLC "Leasing-maximum"	202.53	47
LLC "LK" Volzhanin ""	188.75	10
GC "Absolut"	163.34	24
Globe Leasing LLC	153.67	19
LK ONZA (Atlant-M Leasing CJSC)	108.85	45
CJSC "Combined leasing company CENTER-CAPITAL"	106.00	10
GK "Northern Venice"	63.54	2
CJSC "RG Leasing"	58.37	5
CJSC "DeltaLeasing"	56.75	16
CJSC "INVEST-CONNECTION-HOLDING"	55.00	3
RB Leasing LLC	47.73	3
CJSC "Capital Leasing"	38.67	13
GC "TransCreditLeasing"	38,19	3
LLC "BusinessCarLeasing"	37.51	5

The main volume of leasing transactions falls on the company CARCADE Leasing, located in Volgograd, and Europlan. Representations of this company are located in gg. Krasnodar, Rostov-on-Don, Stavropol. In general, in the territories of UFO and SKFO for enterprises in the shoe industry should not be exposed to significant difficulties in attracting leasing financing for the development of their own production.

For the production of women's shoes during the implementation of this project development strategy for the production of competitive products from leather in the UFO and SKFO enterprise it is necessary to purchase a new, high-performance equipment, a new product. Equipment will be available for leasing. The equipment list is presented in Table 3.

Table 3. Equipment purchased on lease

Name of equipment, office equipment	Productivity	Enterprise-manufacturer of equipment, office equipment	Installed power, kW	Quantity	Price per unit of equipment, rub.	Cost of equipment, rub.
1	2	3	4	5	6	7
Sewing single car with flat platform 441 cl.	-	«Pfaff», Germany	0.27	7	75000	525000
Sewing single-column column machine 591–900 cl.	-	«Pfaff», Germany	0.27	6	79400	476400
Sewing machine double-sided with flat platform for rows double-sided seam 244 cl. «Pfaff»	-	«Pfaff», Germany	0.27	4	78100	312400
Sewing double-column machine 574–900 cl. «Pfaff»	-	«Pfaff», Germany	0.27	3	79600	238800
630 DG	150 par / h	"Shen" Germany	4.5	1	341000	341000
640C	250 par / h	"Shen" Germany	3.25	1	362100	362100
333E	250 par / h	"Shen" Germany	13.0	1	87000	87000
RS2400	120 par / h	IROX FOX Italy	7.0	1	29000	29000
755PC	100 par / h	Sigma Italy	2.2	1	520000	520000
FR4500	150 par / h	IROX FOX Italy	7.5	1	42500	42500
173226 / P1	-	"Sweet" Czech Republic	1.1	1	125000	125000
This				27		3059200

Terms of the leasing agreement between the enterprise and the leasing company:

1) cost of technological equipment - subject of leasing - 3059200 rubles;

2) interest rate on the loan used by the lessor for the purchase of equipment (accrued on the balance of the loan at the beginning of the year), - 15% per annum. Lease term 5 years;

3) depreciation rate of technological equipment supplied under leasing during the useful life of 10 years, - 10% per annum;

4) increasing coefficient to depreciation - 3;

5) loan repayment evenly. Annually 611 840 rub .;

6) commission fee for leasing for technological equipment provided under the leasing agreement - 12% of the total costs of the lessee;

7) additional services (installation of equipment, training of personnel for the use of equipment) (50,000 rubles) are distributed evenly over the term of the lease (over 10,000 for 5 years);

8) VAT rate - 18%.

Leasing payment is determined by the following formula:

$$LP = AM + NI + PC + PDU + KV + VAT, \quad (1)$$

where AM - depreciation of property; NI - property tax (2.2%); PC - payment for the loan; PDU - payment for additional services; KV - commission award; VAT - rate 18%.

1. The amount of depreciation deductions as part of leasing payments is calculated according to the formula:

$$AM = \frac{Ц_{им} \cdot N_{ам} \cdot К_{п}}{100}, \quad (2)$$

where Tsim- the price of the subject of leasing;

$N_{ам}$- depreciation rate;

Kp- increasing coefficient.

$$1годAM = \frac{3\,059\,200 \cdot 10 \cdot 3}{100} = 917\,760 руб.$$

$$2годAM = 917760 \text{ руб.}$$

$$3годAM = 917760 \text{ руб.}$$

$$4годAM = 3059200 - 2753280 = 305920 \text{ руб.}$$

$$5годAM = нет.$$

2. We calculate the property tax:

$$НИ = \frac{Ц_{ост} \cdot СН_{им}}{100}, \quad (3)$$

где Цост- residual value of the subject of leasing;

SNim - property tax rate.

$$1годНИ = \frac{(3059200 - 917760) \cdot 2,2}{100} = 47111,68 \text{ руб.}$$

$$2годНИ = \frac{(3059200 - 917760 \cdot 2) \cdot 2,2}{100} = 26920,96 \text{ руб.}$$

$$3годНИ = \frac{(3059200 - 917760 \cdot 3) \cdot 2,2}{100} = 6730,24 \text{ руб.}$$

$$4годНИ = нет.$$

$$5годНИ = нет.$$

3. Payment for the loan is determined by the following pattern:

$$ПК = \frac{S_{ok} \cdot K_{кр}}{100}, \quad (4)$$

where Juice - the balance of the loan;

K_{cr}- interest on the use of credit.

The results of the calculation of the loan fee are presented in Table 4.

Table 4. Payment for the loan per year

Year	Return credit	Residue at the beginning of the year	Payment for credit resources at a rate of 15%	This payments bank, rub.
1	611840	3059200	458 880	1070720
2	611840	2447360	367104	978944
3	611840	1835520	275328	887168
4	611840	1223680	183552	795392
5	611840	611840	91776	703616
Total:	3059200	-	1376640	4435840

The calculation of the final lease payment is also presented in tabular form (Table 5).

Table 5. Calculation of lease payments per year

Year	Depreciation, rub.	Tax on property, rub.	Payment for credit, rub.	Payment for the ball. services, rub.	Commission. reward	Leasing you pay without VAT	VAT	Leasing payment with VAT
1	917760	47111,68	458880	10,000	172050,2	1605801,882	289044,3	1894846,2
2	917760	26920,96	367104	10,000	158614.2	1480399,155	26471,8	1746871,0
3	917760	6730.24	275328	10,000	145178.2	1354996,429	243899.4	1598895,8
4	305920	-	183552	10,000	59936.6	559408,64	100693,6	660102.2
5	-	-	91776	10,000	12213,1	113989,12	20518.04	134507,2
This	3059200	80762.88	1376640	50,000	547992,4	5114595,226	920627,1	6035222.4

Thus, for 5 years the company will pay the leasing company 6035222.4 rubles. These payments will be included in the cost of the output and deduct the taxable base. In the conditions of a market economy, shoe enterprises face competition, increased instability and indeterminacy of the external environment. Industrial companies created during the command-administrative economy are characterized by a high degree of autonomy of the organization in the production process, where a significant role is still played by auxiliary and service. However, the division of non-profiled activities of enterprises reduces the efficiency of production, which is the reason and without a low level of competitiveness.

In the current period, the heads of shoe factories to reduce production costs should focus their efforts on such aspects of management, such as the separation of non-strategic products and failure to assist.

Important and relevant direction of adaptation of enterprises in light industry to a changing market environment at a given time is at increased commercial risk and in conditions of uncertainty. It allows the manufacturer to solve the dilemma: to buy the required components in the production or to produce them with their own forces, depending on the priorities of the strategic installation of his company: to improve the quality or to reduce the cost.

A shoe company, solving the problem of "buy or produce", puts before the goal:

— to increase the quality of the output at constant production pressures;

— reduce prices for realizable products while maintaining the current level of quality thanks to the reduction of production costs;

increase the financial sustainability of the enterprise thanks to the minimization of waste while maintaining the current level of product quality.

Under outsourcing is understood as a business scheme in which foreign service providers are involved in the implementation of secondary tasks for a company with tasks, functions, processes or their parts.

Transfer of outsourcing parts of enterprise functions purposefully, if:

independent partners will perform them better and cheaper;

this type of activity is not competitively significant and its transfer to outsourcing does not threaten key competencies, capabilities and know-how of the company. Widespread distribution of equipment in outsourcing of services, processing of data, legal services, service of cleaning of premises, maintenance of accounting and a number of auxiliary administrative functions of the company, the company;

it reduces the risk associated with changes in technology or customer preferences;

it increases the organizational flexibility and efficiency of the adoption of decisions, reduces the time of development and export of new goods to the market, reduces the pressure on coordination;

this allows the company to focus on the core business.

Outsourcing involves the transfer of the accounting department, marketing department, transport, service personnel.

The main merits and shortcomings of outsourcing with the position of the customer are presented in Table 6.

Table 6. Advantages and disadvantages of outsourcing from the position of the customer

Preference	Deficiencies
1	2
1. Reduction of damage. Outsourcing allows you to get components or services above quality and (or) cheap	1. The threat of leakage of important information
2. Concentration of management and staff on the core business. Outsourcing allows you to focus on those operations that are effectively performed by the company's forces, and those that are strategically targeted to keep under its control	2. The danger of transmitting too many important functions
3. Improving the quality and reliability of service. Outsourcing companies guarantee the quality of work	3. The threat of severing the leadership unit from business practices (if all the questions for managers are decided by others, then why do they need it?)
4. Introduction of advanced technologies. An outsourcing company is proud of the fact that any industry company is getting acquainted with new developments.	4. Training of other specialists instead of their own
5. Utilization of a positive experience of a stranger. Outsourcing companies have a great deal of experience in solving problems	5. Dependence on one source of the problem

6. Improving governance. An outsourcing company usually uses modern principles and forms of management	
7. Provides great flexibility of a company in case of sudden changes in the market situation or consumer preferences: it is easier and cheaper to find new suppliers with the necessary opportunities and resources to create and maintain the existing ones.	
8. Accelerates the acquisition of resources and skills	

Thus, as a result of this innovation, there is an opportunity to reduce the overall production costs of the enterprise and increase the quality of work performed, as a supplier becomes a specialized organization. In addition, thanks to the reduction in the number of management facilities, the concentration of management resources is growing.

There is another modern and successful business model that allows you to get real competitive advantage, outsourcing staff, or outstaffing.

Outstaffing is a personnel technology in which a company-provider provides services in its staff already existing personnel of the company-client. At the same time, the rights and obligations of the employee go to the service provider, at the same time as the employees themselves continue to work in the front seat and perform their functions.

Outstaffing is convenient when it is necessary to save on its personnel service or "unload" it at large volumes of work. It also allows you to avoid such operations as:
— personnel document management;
— accountability to tax and insurance agencies;
— expenditures related to the organization and operation of workplaces;
— questions of medical staff;
— life insurance;
— rest organization;
— payments of various prizes and bonuses;
— payment for services of third-party personnel consultants;
— corporate training, etc.

Benefits of using outstaffing:
— reduction of staffing while keeping the actual number;
— design of temporary staff;
— formation of employees during the probationary period and extension of the probationary period;
— reduction of administrative and financial losses;
— ensuring legality and legal support when working with staff;
— the ability to concentrate on the core business;
— increasing the competitiveness of the company.

Transfer of employees to outstaffing is carried out according to the following scheme:
determine the customer's needs, and sign an agreement on the provision of outstaffing services with an indication of its term of action, conditions and cost of the service;
the customer dismisses employees transferred to outstaffing, and the provider registers them in his staff;
the provider provides the employees in the staff of the customer under the contract of service;
the employees actually work for the Customer, and the provider leads the registered employees in personnel management, calculates the salary, ie. carries out formal functions of the employee.

At the moment of enrollment of employees transferred to the state provider, the latter will become a formal employee for them. The provider conducts full-time staffing of transferred employees; calculates their earnings and calculates the corresponding taxes; pays the salary and advance, pre-listed by the Customer; draws up sick leaves, leave. By agreement with the Customer, the provider may provide compulsory medical or some additional insurance of employees. Upon request of the provider, the provider will issue a certificate of the installed model. For the Customer, the provider prepares a monthly report on staff turnover and payments to employees and funds.

The customer of the outstaffing service remains for the transferred employees to the actual employee. It provides them with work volume, working space, tools and equipment, work clothes, establishes a work schedule for the time and follows the performance of labor discipline.

The customer monthly calculates the account of the provider of money in the amount of wages of employees, taxes on wages of employees, compensation for the services of the provider. The Fund for remuneration of employees transferred shall be established by the Customer.

Payment of the provider is a contract. Some companies calculate it, coming from the fund of remuneration of employees. However, the capacity of staff production and the calculation of earnings does not depend on the salaries of employees for which these operations are carried out, that is, most companies maintain the established rate of staff turnover in the market. This price is determined by the

provider and the Customer in an individual order when signing the contract.

When transferring to outstaffing for the Customer services there are undoubted benefits. However, it contains some risks.

A potential problem may be the dissatisfaction of the staff transferred to the state provider's outstaffing contract. In order not to make it clear, explanatory discussions will be held with the employees under the contract. Often the problem is addressed through the expansion of the "social package", which is received by the transferred employee. The social package includes, for example, medical insurance. Outstaffing is also one of the ways to legalize labor relations between the employer and the employee. Sometimes the transfer of outstaffing contract is for the employee to be able to get a "legal" job, ie. to be designed for work in accordance with the Labor Code.

Companies can transfer their non-core employees (secretariat, cleaners), focusing on the core business. In this case, the benefits provided by transferred employees can not be distributed to the main employees, the calculation of the profitability of the business for one employee will be higher. In addition, the workload of the Customer will be reduced.

Costs of outstaffing can be attributed to the company-customer on their own.

Benefits of using outstaffing for enterprises as a whole:

1. Increased flexibility in personnel management.
2. Reduction of waste and risks, gaining savings.
3. Decreased document turnover.
4. Reduction of workload on accounting and personnel management.
5. Departure from labor disputes, reduction of risk of strikes, dismantling with labor inspection.
6. Employees working under civil law contracts fall under the validity of the TC of the Russian Federation (legalization). When using outstaffing, the activity of employees will be regulated by the norms of the Labor Code of the Russian Federation.
7. Observation of indicators for the enterprise (for the production of labor, for normative indicators - the production of one employee, labor intensity, labor costs, optimization of staffing, etc.).
8. Reduction of the flow of personnel and those associated with this loss.
9. Possibility to focus on key areas of activity. Full translation of legal and tax liability, related to employment relationships, to the service provider.
10. Supervision of working employees in the absence of obligations on labor relations with them.
11. Possibility to carry out its activities in the regions of Russia without registration of the representative office or branch.

12. Exclusion of possible fines, penalties for violation of employment and related to the tax legislation.
13. Reduction of terms and volume of verified information by the controlling bodies.
14. Expansion of social programs and increase of loyalty of employees of the organization.
15. Dismissal of staff working on temporary projects.
16. Lack of formalities in the staff of employees during their probationary period, which allows to assess the potential of the employee without taking on the obligations.
17. Redistribution of budget articles (salary, services).
18. Need to take care of the maintenance of safety equipment.

Thus, the arguments presented above allow you to claim that under the conditions of the enterprise, producing a competitive product, do not do without such processes as outsourcing and outstaffing.

When outsourcing, the most diverse divisions of enterprises are outsourced - accounting, computer services, logistics, repair shops, transport, warehouses and even fragments of the main production. But one of the fastest growing areas of outsourcing, present in all industries, - catering in enterprises and household services - cleaning of production premises and territories, etc.

The largest operators in the field of management and business services in Russia are the transnational company Sodexo (4000 people, serving 300 Russian enterprises) and the Russian company CorpusGroup (number of personnel), the number of employees is 10000.

Below you will find brief information about the largest outsourcing companies in Russia, CorpusGroup and Sodexo.

Russian outsourcing company "CorpusGroup" - the largest in the country of the operator in the market of the organization of production of food and provision of economic services.

The sphere of its activity includes the following directions:

operation of real estate objects;
professional cleaning of premises and territories;
industrial nutrition;
transport management;
maintenance of remote objects.

Transnational French company Sodexo is the second largest service TNC in the world, providing services for business. She works in 76 countries of the world in 26,700 enterprises, the total number of its employees - 324,000 people.

In Russia, Sodexo serves 300 Russian enterprises, the number of Russian personnel - 4,000 people. Her activities in Russia include:

Business Services:
reception of visitors;

telephone exchange operators;

processing and delivery of correspondence;

household services.

Building services:

operation of technical systems;

control over the condition of the building;

management of communal services;

cleaning of premises;

departure for the adjoining territory;

management of subcontractors;

purpose of application of outsourcing agreements.

In order to adopt a decision on the application of outsourcing agreements in a particular structural unit, it is necessary to determine what the ultimate goal is.

For any chosen purpose, the use of outsourcing is justified only in terms of real cost savings or not exceeding them.

Consequences of actions in the organization of outsourcing activities:

1. Defining the purpose of outsourcing.

2. Definition of auxiliary productions, technological operations (professions), transferred to outsourcing.

3. Preparation of materials (list of professions, the number of people, the terms of the contract, etc.) for the conduct of the tender commission with the purpose of determining the most profitable organization - outsourcer;

4. Planning and protection of funds for outsourcing activities in the budget cost and balance of payments.

5. Conduct of the tender commission and determination of the winner (preference is given to the organization, working on the simplified system of taxation, with experience of work not less than a year and having qualified management staff).

6. Conclusion of the contract.

7. Recommendations.

On the constructive basis are applied the contours of the outer parts of the upper base model: outer back, inner inner front, inner inner back, upper outer outer edge, upper inner inner side, inner detail. The anterior edge of the anterior cruciate ligament and the posterior internal margin are projected on the contour of the URC. For their connections the allowance is 2 mm. The cutting line of the sock is applied constructively in accordance with the sketch of the model and taking into account the location of the V base line. Further, the allowances are designed for the connection of details with a custom two-seam seam, which is 8 mm, on the upper cantilever model is designed allowance for a bend of 4 mm. On the inside, the model is designed with a cut under the bracket "Lightning" with a width of 10 mm. The lower end of the cut is located on the line, connecting the end I of the base line and the beginning of the II base line. The basic design of internal details of the top (Figure 1) serves as a constructive basis of external details of the top without processing. The set of internal details of the top of the boots includes a fur lining, leather, pin, valve under the lightning. The internal details of the top are designed according to the standard method. The leather part is designed in the heel part. The parameters of the leather construction are assigned to the graphic part. The stapler is designed with a width of 22 mm, the allowance for connecting the staples on the front and back edge is 2 mm. The perimeter of the fur lining is already the perimeter of the outer details of the top at 8 mm, the front edge of the fur lining is connected by a crown seam, the allowance is 5 mm. The fur lining in the sock part is shortened to 3 mm from the stretch mark, and further it is designed on the contour of the stretch mark. 401 The basis for the design of intermediate details of the top (Figures 2 - 3) serve the contours of the outer details of the top without breaks for processing. Designed for the basic model: lining under the sock, lining under the back of the shoulder, inner lining under the back of the inner front, lining under the back of the inner back, lining under the upper part of the shoulder. Intermediate details of the top are designed according to the standard method, the parameters of construction are indicated on the drawing. The shape and dimensions of the hard back and tray depend on the type of shoe Intermediate details of the top are designed according to the standard method, the parameters of construction are indicated on the drawing. The shape and dimensions of the hard back and tray depend on the type of shoe Intermediate details of the top are designed according to the standard method, the parameters of construction are indicated on the drawing. The shape and dimensions of the hard back and tray depend on the type of shoe

To obtain the traces of the traces, the pad is placed with a needle surface on a sheet of paper and the contour is drawn vertically with a pencil. A 10 mm drop is built into the contour and a pattern is cut along the drop line. On the entire perimeter are made incisions with a depth of 15 mm at a distance between them 15 mm. The cut pattern is glued to the traces of the pads with the subsequent tilting of the strip along the traces of the pads and mark the line of the ribs with a pencil. Template pads are removed from the pads, glued to a dense sheet of paper and cut along the marked contour.

The basis for the construction of the spaces will serve the contour traces of the pads. The profile is designed along the contour of the main insole, which is applied a drop on a stretch edge, equal to 15 mm. The corrugation is usually applied in two, three sizes, so the gap between the specified allowance on the stretch and the corridor is 2 cm (Figure 4).

The built-in insole is built on the contour of the main insole with minor deviations. Thus, in the nasal part it is shortened by comparison with the main insole by 3 mm and retained by 1 mm, in the beam part the contour of the injector must coincide. In the

gelenochnoy part of the inserted insole with the outer side are built the main shaft at 2.5 mm, and with the inner side - at 3 mm, in the heel part of the tabled shaft at 2 mm and the longest main shaft at 2 mm (Fig.).

The basis for the construction of the soles is the contour of the traces of the pads. On a clean sheet of paper pass the straight line, then put the spread of the traces of the pads so that the most protruding points of the contour of the nose and heel parts were found on the specified line. Sharply sharpened pencil draws the contour of the traces of the traces of a thin line (Fig. 6).

The sole is designed with heels, the length of which along the axis of symmetry of the heel part should be equal to the maximum width of the sole and equal to 20 mm. The heel front line runs perpendicular to the axis of symmetry of the heel part. The distance from the inner contour of the sole to the gaps to lighten the heel is equal to 15 mm. The distance from the heel front line to the gaps for its relief is equal to 7 mm on the sole. The thickness of the partition between the cells is equal in the upper 2 mm, in the lower part - 3 mm.

The basis for the design of the sole in the plan with the running side serves the contour of the formed sole with the inner side. On the running side, the soles of the heels are applied, the position of the heel is determined. The drawing on the running surface is made taking into account the technological, operational and aesthetic requirements.
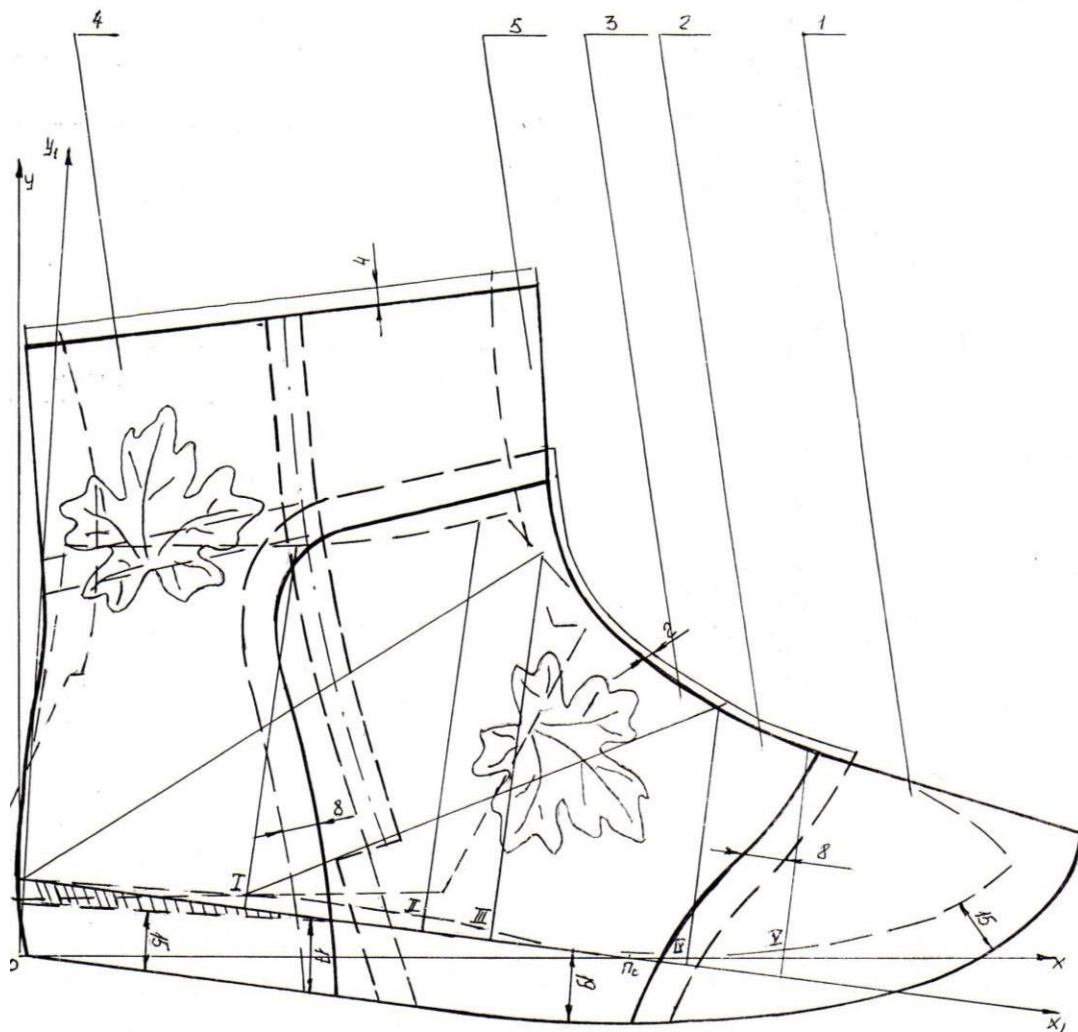
Figure 2 - Construction of external details of the top of the shoe
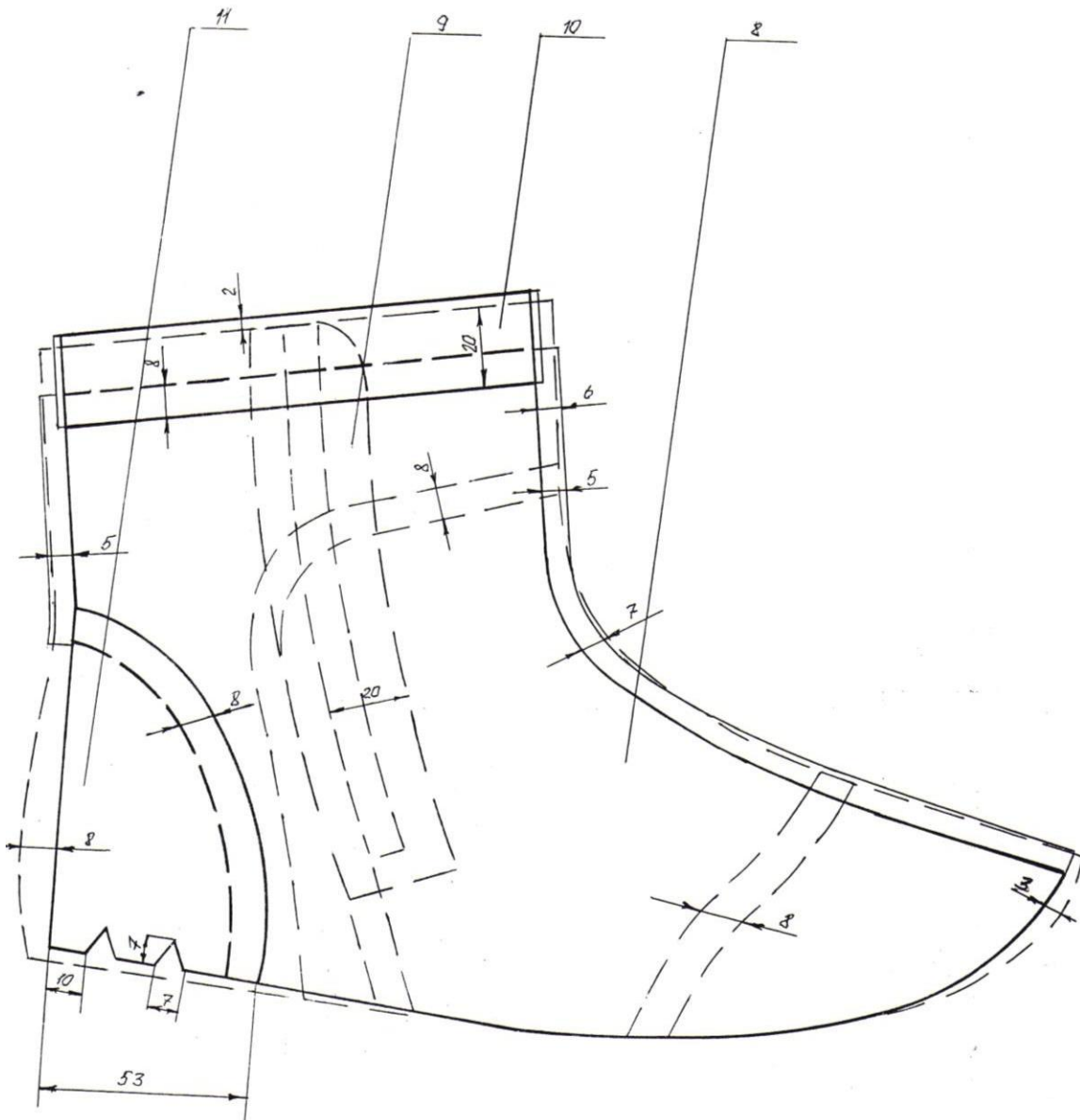
Figure 3- Construction of the inner details of the top of the shoe
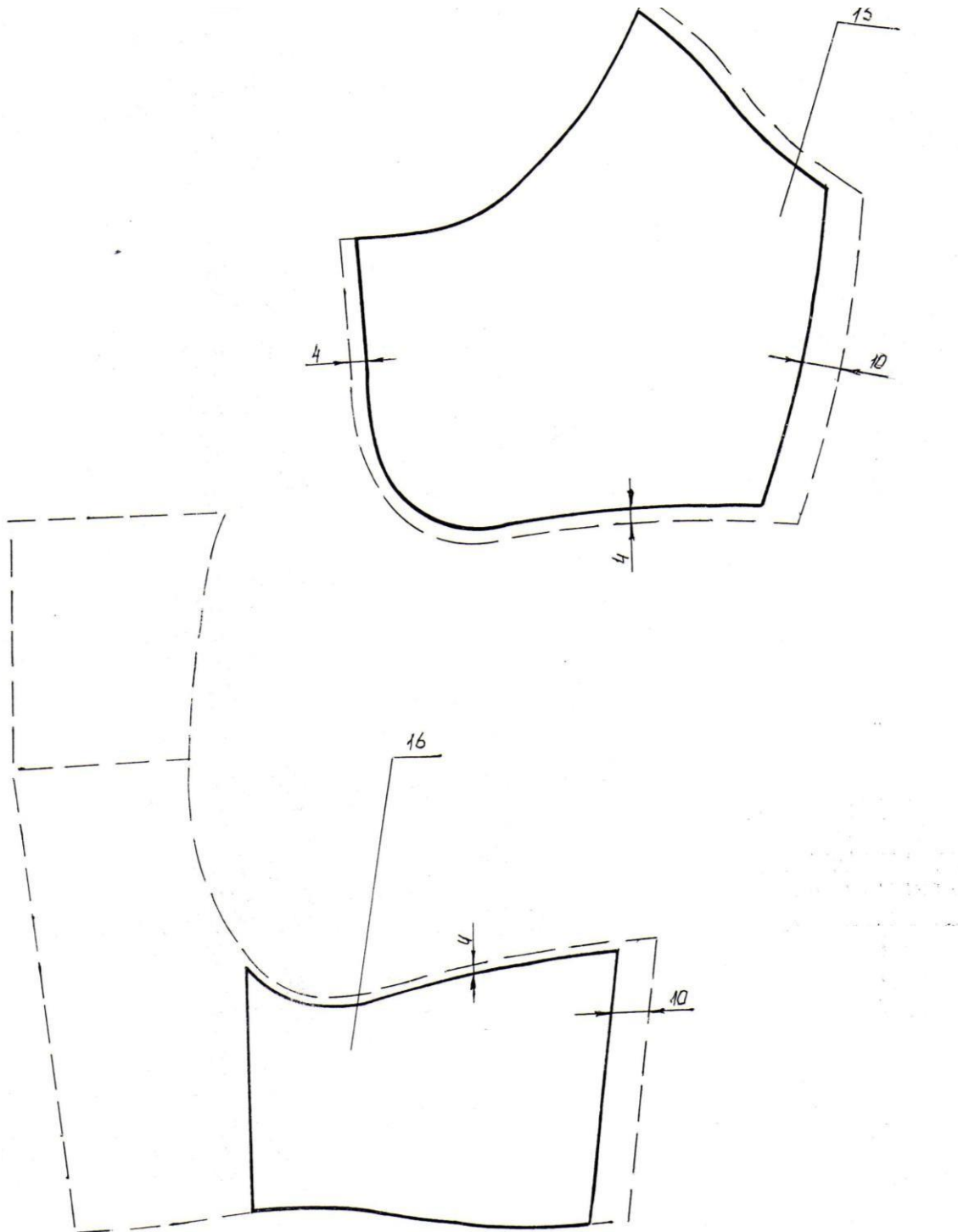
Figure 4 - Construction of the intermediate details of the upper part of the shoe
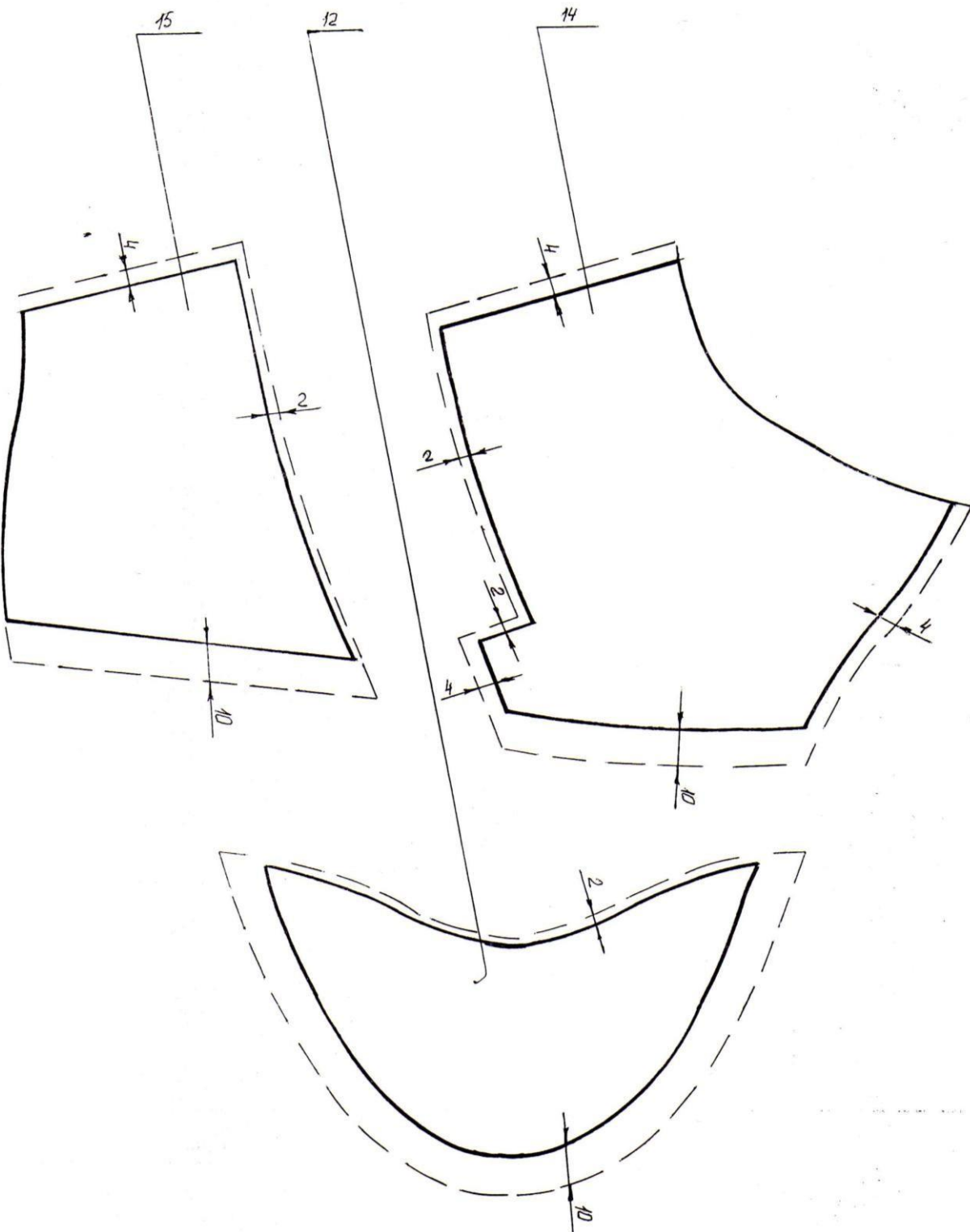
Figure 5 - Construction of intermediate details of the upper part of the shoe

Calculates the production program for the projected technological process of children's shoes

The production program represents a system of planned tasks for the release of products in the established range of nomenclature and quality, to meet the various needs of the consumer. The volume of production in kind is calculated by taking into account the number of working days, the number of shifts and the number of shifts.

To calculate the number of working days, the fund of working time for the planned 2022, which is presented in Table 7.

The point of failure is the minimum size of the output, which achieves the balance of sales revenue and production surplus.

The point of innocence is found by graphical and analytical methods. Graphic point of innocence lies at the crossroads of sales volumes and full production volumes (in the breakdown of the latter into permanent and variable).

Analytical point of innocence (Tb / y) is determined by the formula:

$$\frac{Tb}{y} = \frac{With_{UPZ}}{Ц_{ed} - With_{UPPZ}}$$

where ZUPZ - conditional-permanent costs per unit of production, rub .; B - the number of products; Price - unit price of products without VAT, rub .; ZUPPZ - conditional-variable costs per unit of production, rub.

For the implementation of this project, the development of production strategies, competitive products from the skin purposefully develop a component of technological equipment, on the basis of which it is possible to form a technological process for the production of 500 units, including the production of a manpower. forms of production organization. It should also be noted that the developed technological chains can be used only for the production of footwear glue method of fastening. The layout of technological equipment and workplaces is presented below.
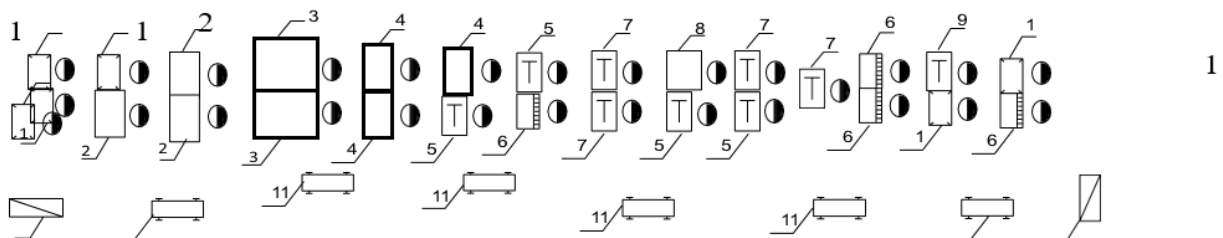
Figure 6 - Scheme of the technological process of assembling the preparation of children's boots (capacity - 562 pairs per shift)
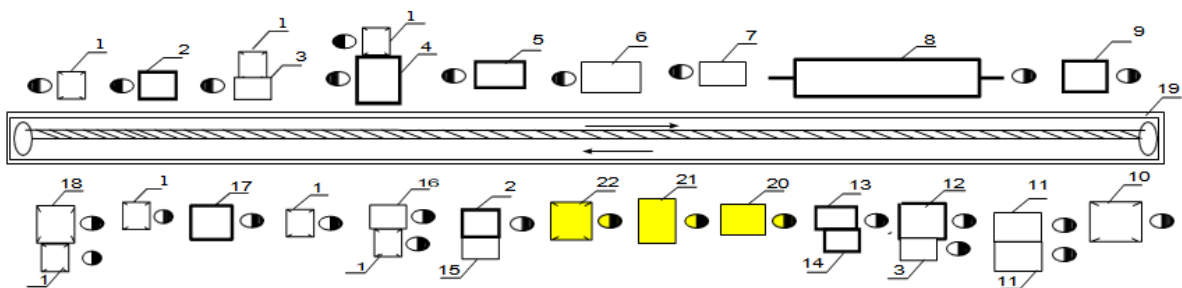
Figure 7 - Scheme of the technological process of assembling shoes for children's school shoes (capacity - 562 pairs per shift)

The outer details of the top of the boots (union of the outer, the union of the inner, the detail of the union, the apex of the front, the apex of the outer apex, the apex of the inner apex, the decorative strap of the apex) are constructively constructed in a constructive manner. Additions to each detail are added to the joint - 8 mm, to the bend - 4 mm. To get the details of the crown, the details of the allies perform the following. First, they translate the detail on a tracing paper, cut out and make overlays in those places, where it is necessary to disperse. After that, the resulting template is combined on the drawing along the line of inclination and drawn along the contour.

To determine the direction of the "lightning" stops mark the point M on the middle of the upper canvas with the inner side and lead to the line SB,

connecting the points of intersection of the baseline lines IV and I, respectively, with the upper end. Lower point M′ "Lightning" straps must be located on the line of the SB, if this point is located above the line of the SB, then wearing boots will be difficult.

The lightning valve is designed with a width of 28 mm. He has to close the lightning bolt with the side of the foot.

To draw the contours of the details fur linings use the contours of the structural base of the top without additions to the processing.

The lining of the designed boots consists of fur lining under the ankle, pins, valve under the zipper and leather.

Basically, the design of the details of the shoes is based on their constructive features (such as shoes,

heel height, method of fastening and processing of details, etc.) and the development of traces of pads.

To obtain traces of the traces of the tray put a needle surface on a sheet of paper and the contour is drawn vertically with a pencil. A 10 mm drop is built into the contour and a pattern is cut along the drop line. On the entire perimeter are made incisions with a depth of 15 mm at a distance between them 15 mm. The cut pattern is glued to the traces of the pads with the subsequent tilting of the strip along the traces of the pads and mark the line of the ribs with a pencil. Template pads are removed from the pads, glued to a dense sheet of paper and cut along the marked contour.

For the best formation of the back of the main insole in the heel part is shortened to the magnitude yP, mm, which depends on the thickness of the insole and the curved profile of the side surface of the pads in the heel, e.g. from the corner α, formed by the cutter and perpendicular to the pads in the given section.

The main half of the ridge is built on the contour of the main ridge. In the heel alternating parts, their contours coincide, and the anterior line of the main semicircle does not reach a cut of 0.68D to 10 mm.

The gelenok is located along the axis of symmetry of the heel part and up to the anterior edge of the semicircle does not reach 8 mm. For the construction of the axis of the heel part of the symmetry section 0.18 D divide the halves and the resulting cut is placed on the section 0.68 D. Through the obtained points run the axis of symmetry of the heel part.

The profile is designed along the contour of the main insole, which is applied a drop on a stretch edge, equal to 15 mm. The gap is usually applied in two, three sizes, so the gap between the specified allowance on the stretch and the gap is 2 mm.

The built-in insole is built on the contour of the main insole with minor deviations. Thus, in the nasal part it is shortened by comparison with the main needle at 2 mm and is reduced to 1 mm, in the beam part the contour of the needle coincides. In the gelenochno part of the inserted insole with the outer side the width of the main is 2 mm, and with the internal - 4 mm, in the heel part of the inserted insole is 2 mm and the length of the main is 2 mm.

The basis for the construction of the soles is the contour of the traces of the pads. On a clean sheet of paper pass the straight line, then put the spread of the traces of the pads so that the most protruding points of the contour of the nose and heel parts were found on the specified line. Sharply sharpened pencil draws the contour of the trace traces of the pads with a thin line.

The sole is designed with heels, the length of which along the axis of symmetry of the heel part should be equal to the maximum width of the sole and equal to 72 mm. The heel front line runs perpendicular to the axis of symmetry of the heel part. The distance from the inner contour of the sole to the gaps to lighten the heel is equal to 15 mm. The distance from the heel front line to the gaps for its relief is equal to 7 mm on the sole. The thickness of the partition between the cells is equal in the upper part to 2 mm, in the lower part - 4 mm.

The basis for the design of the sole in the plan with the running side serves the contour of the formed sole with the inner side. On the running side, the soles of the heels are applied, the position of the heel is determined. The drawing on the running surface is made taking into account the technological, operational and aesthetic requirements.

Formed sole has a profiled section. The incision shows the thickness of the soles in different areas, the depth of the relief strips, the pattern on the walking surface of the soles and heels.
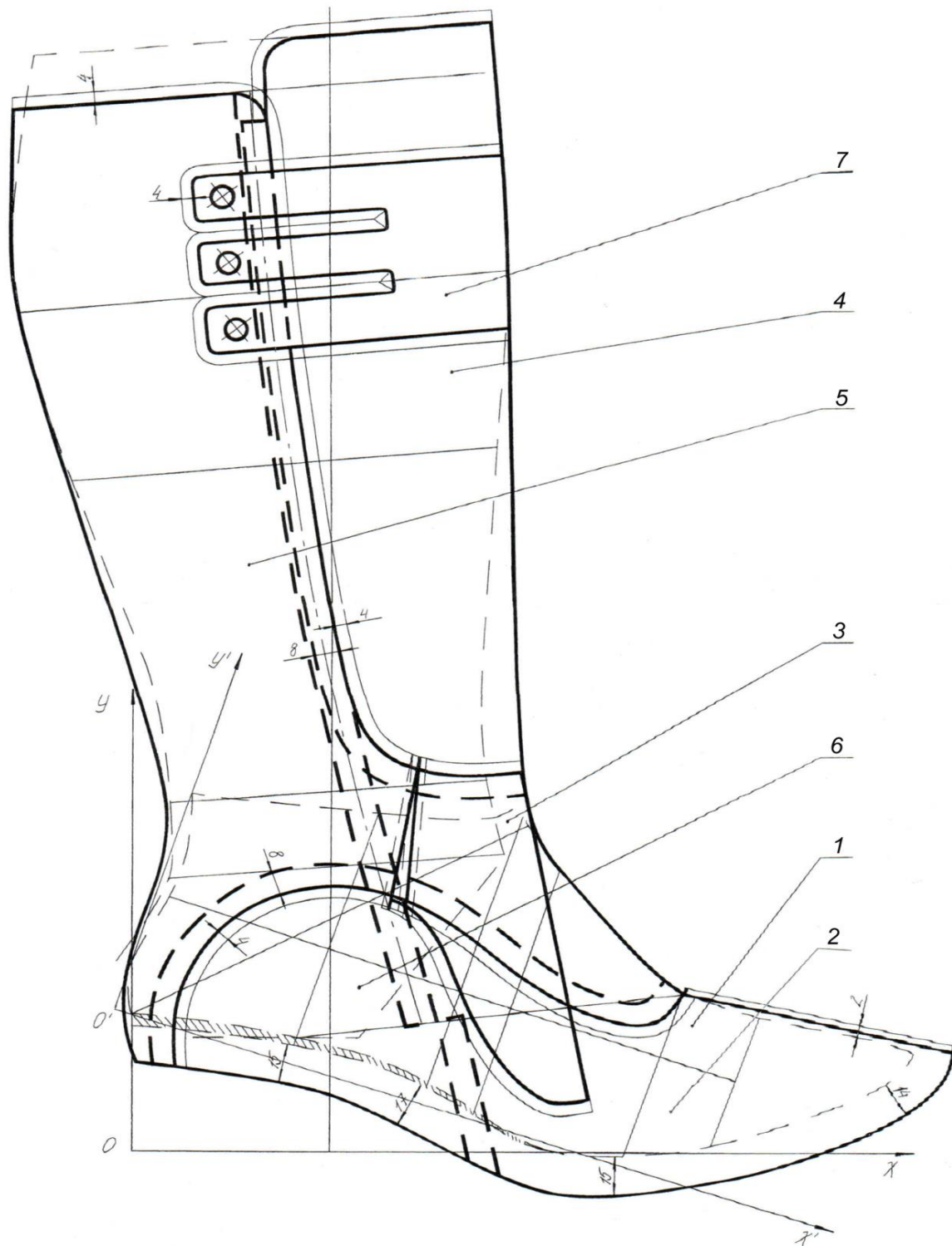
Figure 8 - Scheme of the technological process of assembling shoes for children's school shoes (capacity - 562 pairs per shift)
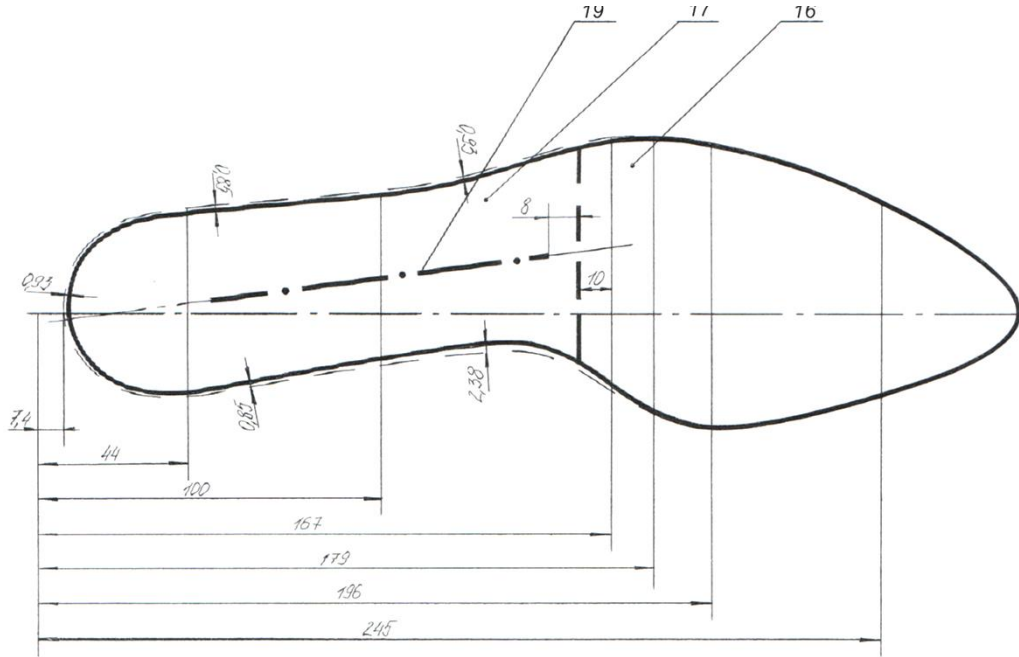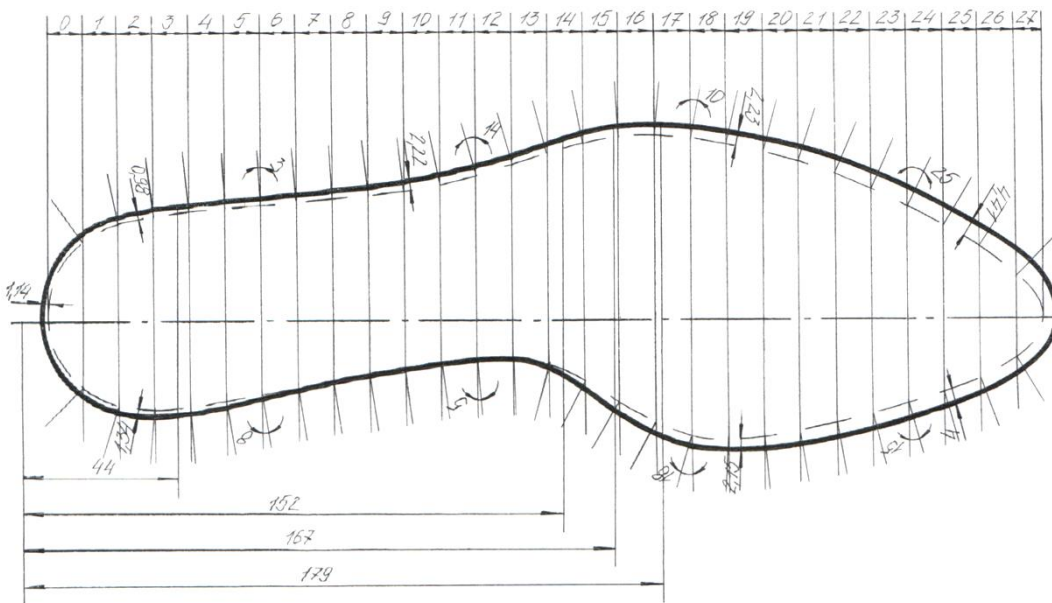
Figure 9. Construction of internal details of the upper base of women's boots

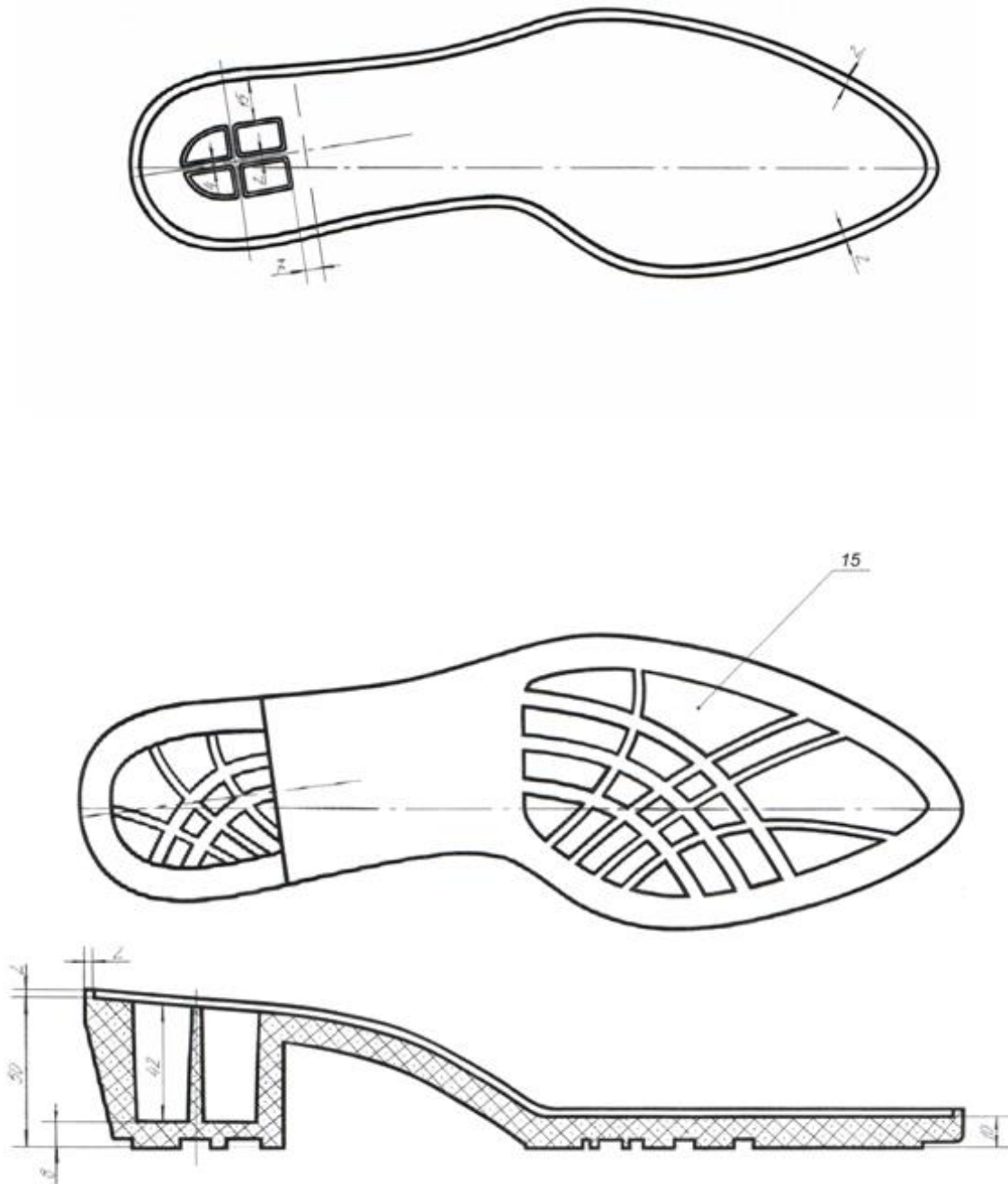**Figure 10 - Construction of the main insole and the inner contour of the formed soles of the basic models of women's boots**

Figure 11 - Construction of soles with running and non-running sides, cutting of solesbasic models of women's boots
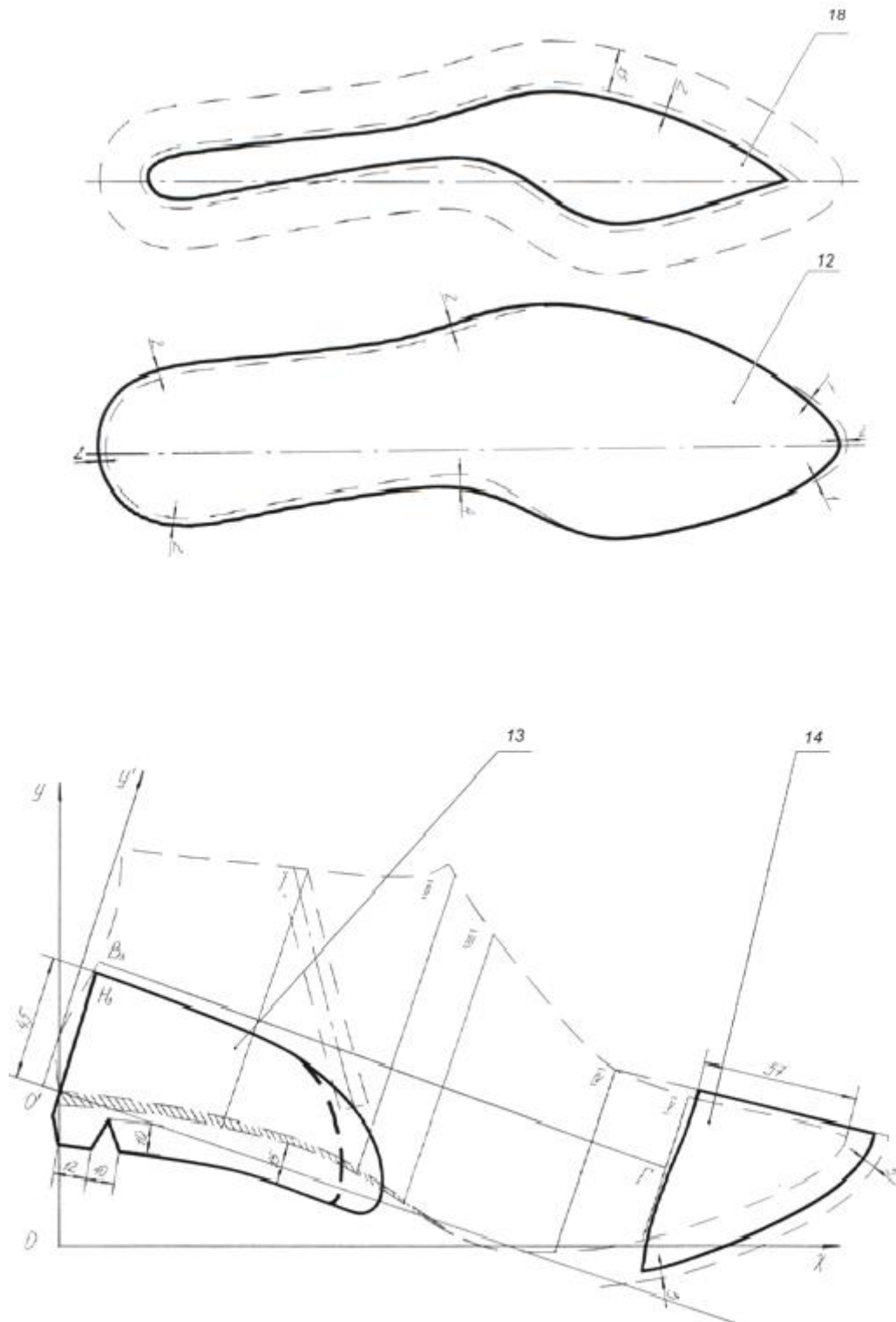
Figure 12 - Construction of tabbed insoles, sheets, backpack and tray of basic models of women's boots

On the basis of the design capacity is calculated by the type of work of the enterprise for the production of each j-y model.

The number of workers on the site of the collection of shoe blanks K sb.ZVOj, person, is determined by the formula:

$$K_{сб.ЗВОj} = \frac{M_{см.пр. j} t_{сб.ЗВОj}}{T}$$

(18).

$$K_{sb.ob. j} = \frac{M_{см.пр. j} t_{сб.об.j}}{T}$$

(19)

The number of workers on the site of the collection of shoes K sb.ob. j, чел., is determined by the formula:

Table 8. Specification of equipment for the technological process of assembly of blanks for women's shoes

| 01	ST-B	Base table	08	ST-B with an extractor	Working table with an elongated device
02	SS-20 "Comelz"	The machine for lowering the edges of the upper parts	09	244 cl. «Pfaff»	Sewing machine two-cornered with a flat platform
03	3SE-RZ Fortuna	Machine for cutting fur edges	10	01356 / P1	Drilling machine for drilling holes and inserting blocks and holnitens
04	441 cl. «Pfaff»	Sewing single car with a flat platform	11	Mod. 527-101 «DURCOPP ADLER»	Sewing machine for assembling details with a shift seam
05	01276 / P12	Machine for smoothing seams workpieces with one-time gluing of threads	12	591-900 cl. «Pfaff»	Sewing single-column machine
06	C1100B	Machine for duplication of upper parts with lining and tray	13	SJ-2	Shelving shelf
07	SOM 52	Machine for bending edges details with simultaneous application of glue-melting	14	TO. 059-76	Trolley for shoes
The coefficient of mechanization is 0.727. Number of employees - 33 people.					
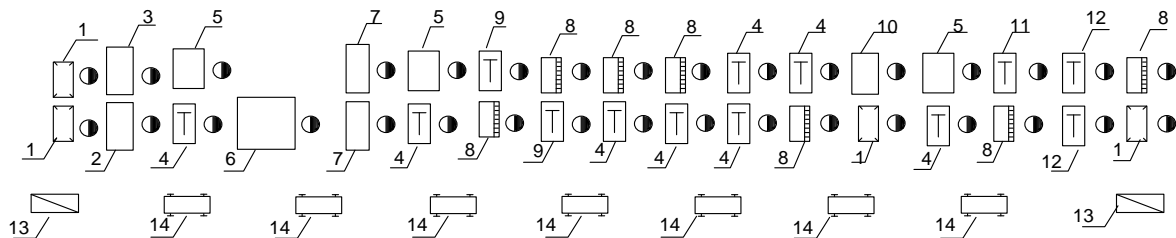
Figure - 13 Scheme of technological process of assembling women's shoes (capacity - 471 pairs)
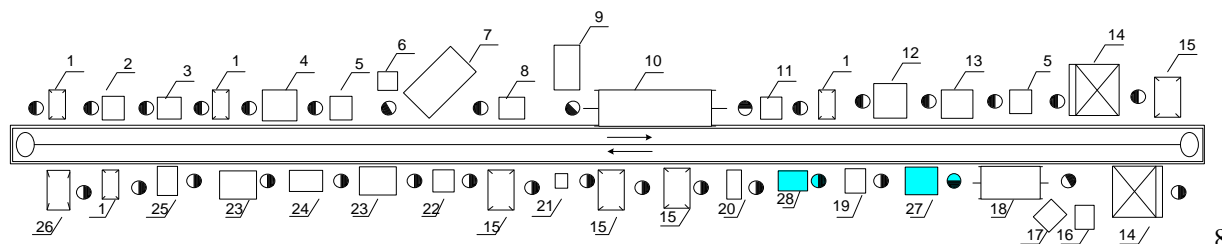
Clarivate
Analytics indexed

Figure 14 Scheme of the technological process of assembling women's shoes (capacity - 471 pairs)

It is necessary to perform auxiliary constructions for the design of the whole union. The vertex of the tongue of the union (point A) is located on the upper contour of the URK between II and III baseline lines. To conduct the line crossing of the tongue union it is necessary from point A below 3 mm and the resulting point to connect with the point union S. When designing the union, it is necessary to take into account that the minimum width of the union of the tongue in the upper part should be 35 mm, in the lower part - 45 mm, and the place of attachment of the tongue in the wing of the union should be at the level of the end.

The basic design of internal details of the top serves as a constructive basis of external details of the top without processing. The set of internal details of the upper half of the boot includes a textile lining under the union, a leather lining under the beret, a leather jacket. At the elongated edge of the inner parts of the top by comparison with the external details of the top are shortened to 7 mm.

The shape of the front parts of the leather lining under the beret and the textile lining under the union depends on the design features of the model and the method of assembly of the upper shoe. Along the line of the cantilever lining under the ridge is designed above the contour of the ridge at 2 mm. Such arrangement of skin linings under the beret and birch provides convenience of their assembly with subsequent performance of operations on attachment and trimming of excess skin lining.

The front edges of the lining under the ridge are designed at 4 mm above the line of inclination of the tongue of the union and the union, so as these edges are connected to the overlap. The lower edge of the underlayment under the ridge is designed constructively.

The leather part is designed in the heel part. The parameters of the construction of the skin are shown on the drawing.

Line bending textile linings under the union are designed along the bending line of the union. The front contour of the textile lining under the union is carried out equidistantly the contour of the lining under the ridge at a distance, equal to the width of the joint on the joint, ie. 8 mm.

The basis for designing the sub-linings are the contours of each external detail, drawn separately from other details without processing on processing. Intermediate details of this model include: inter-padding under the beret, interlayer under the union, interlayer under the back, backpack and tray.

When determining the shape and size of the details of the lining, it is necessary to take into account that the lining of any detail must fall under the line, fastening this detail with another, it is desirable that the 5 hit did not fall under the bend. Standards for designing details of linings are shown on the drawing.

The main half of the ridge is built on the contour of the main ridge. In the heel part, their contours coincide, and the front line of the main semicircle does not reach the cut of 0.68 D to 15 mm.

Gelenok is built on the axis of symmetry of the heel part. Up to the front edge of the semicircle it does not reach 10 mm. For the construction of the axis of symmetry of the heel part of the section 0.18 D we divide the halves and the resulting cut is placed on the section 0.68D. Through the obtained points we pass the axis of symmetry of the heel part.

The basis for the construction of the bed serves as a contour of the traces of the pads, which are applied to the stretch mark. The gap between the stretch edge and the gap is 2 mm.

The built-in insole is built on the contour of the main insole with minor deviations. Thus, in the nasal part it is shortened by comparison with the main insole by 3 mm and retained by 1 mm, in the beam part the contour of the injector must coincide. In the gelenochnoi part of the inserted insole with the outer side, the width of the base is 2.5 mm, and with the internal side - at 3 mm, in the heel part of the inserted insole is 2 mm and the length contour. To the drawing of the inner contour is added a rant with a width of 2 mm, which with the outer and inner side enters the line of the front of the heel, and then passes into the rant without a cross. The width of the wound without incisions in the heel part is 2 mm (including the shelf).

The front line of the heel runs perpendicular to the axis of symmetry of the heel part and builds it with a radius of 120 mm. The distance from the inner contour of the sole to the gaps to lighten the heel is equal to 15 mm. The distance from the heel front line to the gaps for its relief is equal to 7 mm on the sole. The thickness of the partition between the cells is equal in the lower part of 3.5 mm, in the upper - 2.5 mm.

The basis for the design of the sole in the plan with the running side serves the contour of the formed sole with the inner side. On the running side, the soles of the heels are applied, the position of the heel is determined. The drawing is developed with the account of technological, operational and aesthetic requirements.

The formed sole has a profiled section, the profile of which is reflected in the incision. The incision shows the thickness of the soles in different areas, the height of the shelves, the depth of the light floors.
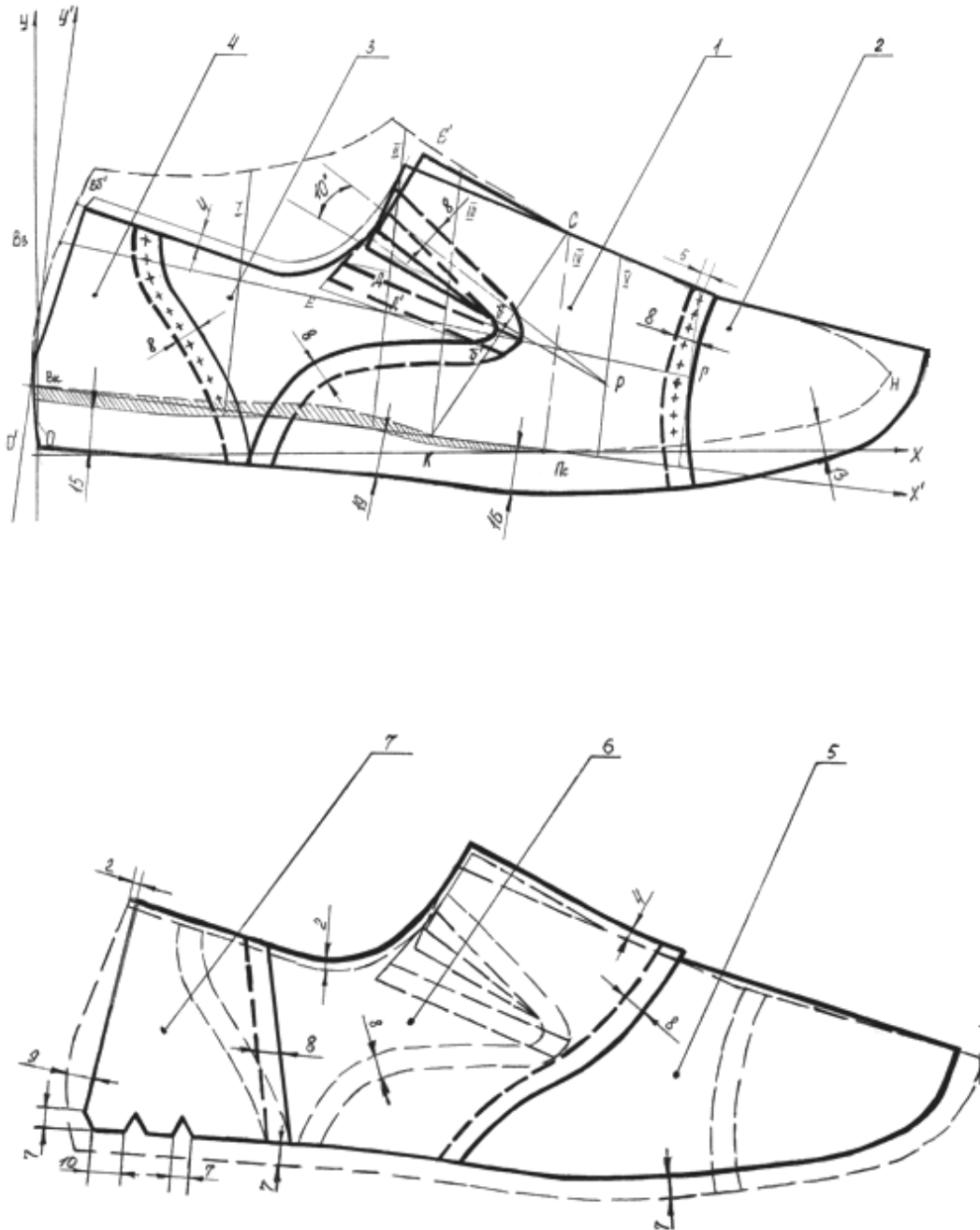
Figure 15 - Construction of external and internal details of the upper half of men's autumn semi-boots
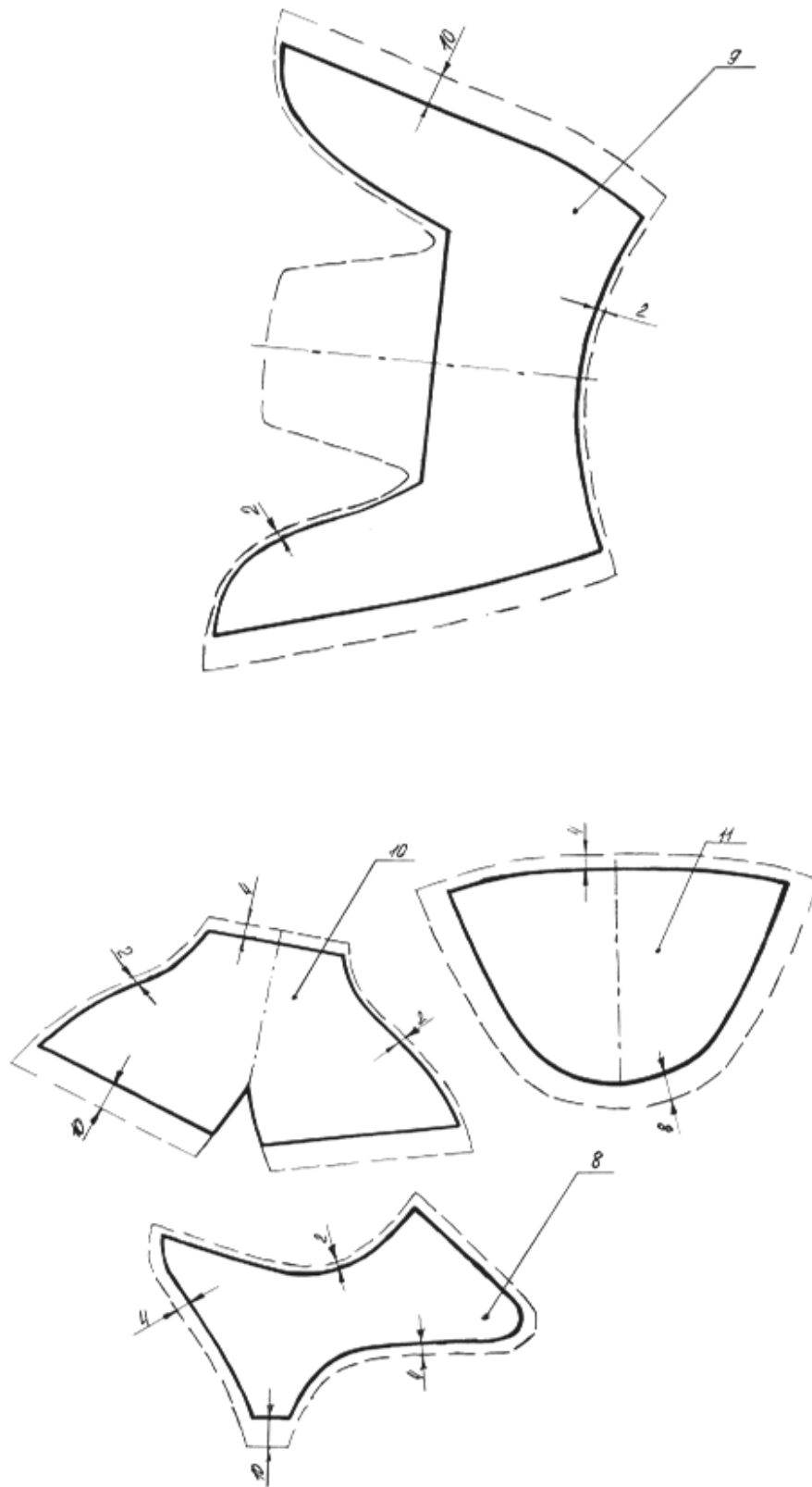
Figure 16 - Construction of intermediate details of the upper half of men's autumn semi-boots
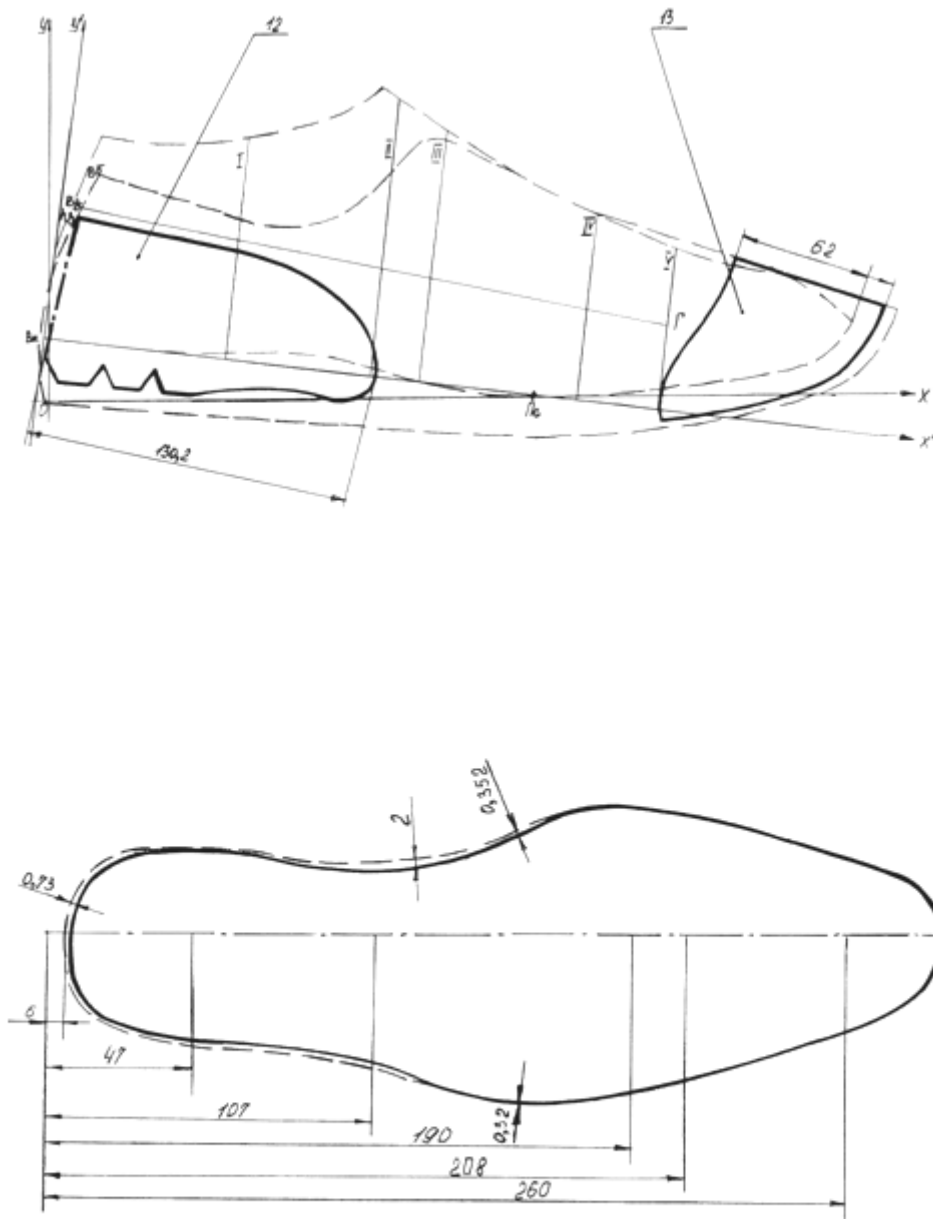
Picture 17- Construction of the backrest and tray, the main insole of the base model men's half-boots

Figure 18 - Construction of tabbed insoles and base models men's half-boots
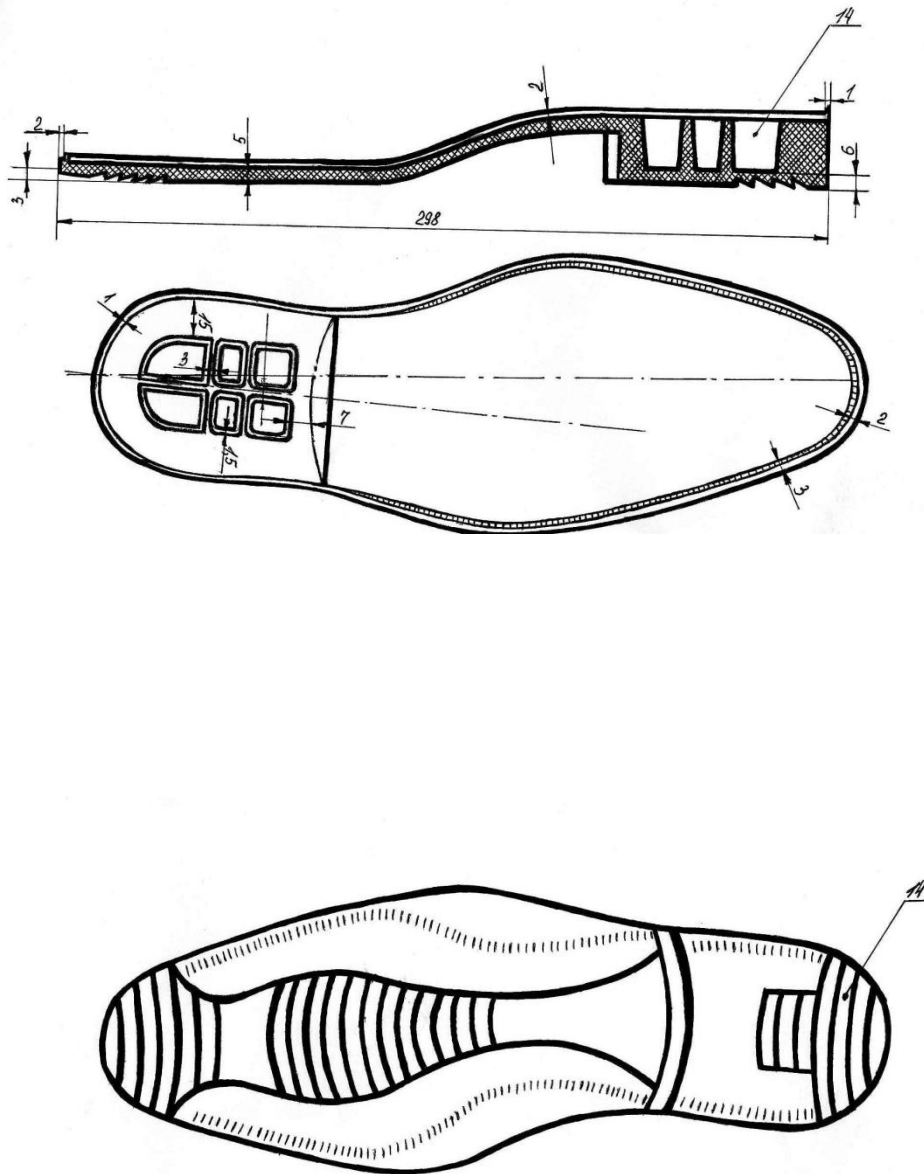
**Figure 19 - Construction of the inner contour of the molded sole,
soles with running and non-running sides and cutting soles of base models
men's half-boots**

For the analysis of the effectiveness of the work of footwear enterprises developed the basis for the development of the software product, allowing to calculate the receipt of money from operating activities. This program will become an instrument that will help the head of the enterprise to calculate and analyze the results of production at any time, and also in the case, if the cash flow decreases or decreases. raises the phenomenon of insolvency, and will be able to take the necessary measures in a timely manner. The proposed methodology gives the opportunity to constantly monitor consumer demand for appropriate types of footwear, the ability of the population and the structure of the market to form a competitive assortment of enterprises, educational and training institutions.

Table 9. Specification of equipment for the assembly of men's semi-boots

| 01	ST-B (Russia)	Base table	07	Pfaff 591-726 (Germany)	Sewing machine for fastening details with automatic threading
02	SS20 Comelz (Italy)	The machine for lowering the edges of the upper parts	08	01276 / P12 (Czech Republic)	Machine for smoothing seams with simultaneous gluing of threads
03	A2000 Selmac (Italy)	Duplication of top lining and inserting of thermoplastic tray	09	GP 2 Colli Italy	Sewing machine for fastening details with one-time cutting of lining overlays
04	RPP67TE Sagita (Italy)	Machine for bending edges of parts with simultaneous application of glue-melting and gluing of fastening threads	10	SJ-2	Shelving shelf
05	Pfaff 574-900 (Germany)	Sewing machine for fastening details with two-seam seam	11	TO.059-76	Trolley for shoes
06	ST-B with hood (Russia)	Prayer table and gluing details	12	F81 CMCI (Italy)	Machine for moccasins lines
The coefficient of mechanization is 0.643. Number of workers - 28 people.					
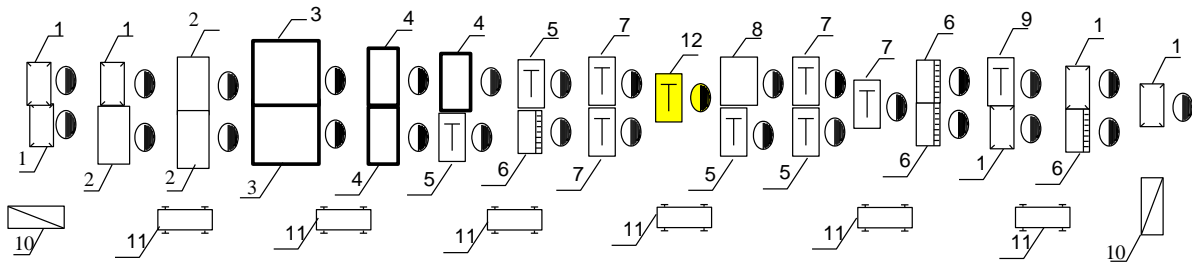
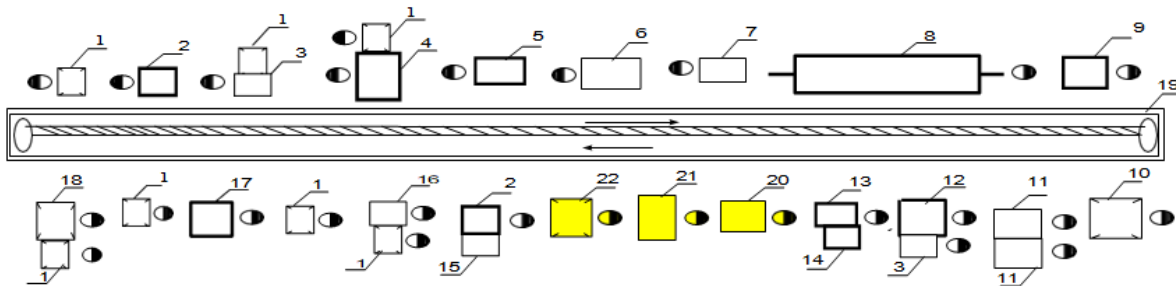**Figure 19 - Scheme of technological process of assembly of male semi-finished products (capacity - 650 pairs per shift)**

Figure 20 - Scheme of technological process (capacity - 650 pairs per shift)

The financial well-being and sustainability of the enterprise in many respects depends on the provision of money, ensuring the coverage of its obligations. The lack of a minimum necessary reserve of funds can indicate the financial difficulties. In its turn and the surplus of money can be a sign that the enterprise is making a profit. The reason for these losses may be related to inflation and depreciation of money, as well as the possibility of their profitable allocation and receipt of additional income. In any case, it is the analysis of cash flows that allows you to establish a real financial situation in the enterprise. Money flow is the difference between the amounts of transactions and the payment of funds of the company for a specified period of time. It is characterized by the degree of self-financing of the enterprise, its financial strength, financial potential, profitability.

by the flow of equal amounts of money (or results in cost) on this step;

ottokom, equal payments on this step;

balance, equal difference between flow and flow.

Money flow usually consists of fractional flows from separate types of activity:

cash flow from the investment activity of the enterprise;

cash flow from operating activities;

cash flow from financial activities.

Effective cash flow management increases the degree of financial and production flexibility of the company, as follows:

to improve operational management, especially from the point of view of balanced actions and expenditures of funds;

increase in sales volumes and optimization of losses at the expense of greater opportunities for maneuvering the company's resources;

increase the efficiency of management of long-term obligations and the cost of their services, improve the conditions of negotiations with creditors and suppliers;

creation of a reliable base for assessing the effectiveness of the work of each of the divisions of the company, its financial condition as a whole;

increasing the liquidity of the company.

Every enterprise has a place to be in all three types of activity.

In the current flow of investment activities as a return, the distribution of pre-allocated steps for the calculation period is spent on the creation and operation of new fixed assets and the liquidation, replacement or replacement of the replacement. In addition, the cash flow from investment activities includes changes in working capital (the increase is considered as the flow of money, the decrease - as an invention). Also include own funds invested in the deposit, as well as costs for the purchase of valuables from other business entities, intended for project financing. As a stream of cash flow from investment activities include income from the sale of outstanding assets (sale of shoes or sale of obsolete equipment).

The main sources of income are sales of products and other income. The volumes of production must be indicated in natural and cost terms. The source information for determining the revenue from the sale of products is set by the steps for each type of product. Therefore, the proceeds from the sale of inputs and outputs in real money should be taken into account the income and expenses from non-realizable operations, not directly related to the production of products. To him, in particular, relate:

income from the lease of property in rent, or leasing;

receipt of funds at the closing of deposit accounts and on purchased valuables;

return loans provided to other participants.

Ottoki from operating activities are formed from the cost of production and surplus products, which usually consist of production deductions and taxes. The financial activity refers to the operation of funds with respect to the investment project, ie. not at the expense of the project. They consist of equity (equity) capital and attracted funds. Current flows from financial activities as deposits include investments in equity and additional funds: subsidies and grants, borrowed funds, including and for the account of the outstanding enterprise; as repayments - the cost of repayment and servicing of loans and issued by long-term enterprises, as well as the need to pay dividends on shares of the enterprise.

Money flows from financial activity to a large extent are formed during the development of financing schemes and in the process of calculating the effectiveness of the investment project.

If the manufactured footwear is not fully realized, the enterprise loses part of the profit, which is necessary for further development of production. In order to reduce losses, the manufacturer must have daily information about the sale of products and make decisions about the timely change in the price of specific models of shoes. Prepared the basis for the development of the software product, allowing to calculate the receipt of cash from operating activities. This program becomes a tool for the sales manager or marketer, which controls the sales process of a specific model. As a result of the proposed calculation we get a clean slate of operating activities. A decrease in the sales volume leads to a decrease in the cash flow and requires a reduction in the holiday price of the product with the purpose of increasing the sales volume.

Impact Factor:

ISRA (India)	= **6.317**	**SIS** (USA)	= **0.912**	**ICV** (Poland)	= **6.630**
ISI (Dubai, UAE) = **1.582**		**РИНЦ** (Russia) = **3.939**		**PIF** (India)	= **1.940**
GIF (Australia)	= **0.564**	**ESJI** (KZ)	= **9.035**	**IBI** (India)	= **4.260**
JIF	= **1.500**	**SJIF** (Morocco) = **7.184**		**OAJI** (USA)	= **0.350**

1. Volume of sales (these are included in the manual and depend on the model released);
2. The unit price of the item (these are included in the manual);
3. Vyruchka = 1 2;
4. <u>Algorithm for calculating variable costs:</u>

4.1. Raw materials and basic materials $= \sum_{i=1}^{n}$ Consumption rate of i-th base material Price of i-th material;

4.2.1. Ktr - coefficient, taking into account transport costs (these are included in the manual (0.15));
4.2. Raw materials and basic materials with accounting of transport costs =
= 4.1·4.2.1 + 4.1;

4.3. Auxiliary materials $= \sum_{i=1}^{n}$ Consumption rate of auxiliary material·Price i-go material;

4.4. Auxiliary materials with accounting for transport costs = 4.3·4.2.1 + 4.3;
4.5.1. The total power of the installed equipment (these are included in the manual);
4.5.2. Equipment load factor (data are included manually);
4.5.3. Tsm - the duration of the shift (these are included in the hand (Tsm = 8));
4.5.4. Dr - the number of working days in a year (given to the hand (Dr = 249));
4.5.5. Loss of energy during transmission (these are introduced into the hand (0.85));

4.5. Annual amount of electricity consumed for technological purposes $= \dfrac{4.5.1 \cdot 4.5.2 \cdot 4.5.3 \cdot 4.5.4}{4.5.5}$;

4.6.1. Price 1 kW (data are included in the manual);
4.6. Expenditures on fuel and energy = 4.5·4.6.1;
4.7.1. The number of working days in which the i-i model is issued (these are included in the manual);
4.7.2. Issue of items in a shift (these are included in the manual);
4.7. Issue per year = 4.7.1·4.7.2;
4.8.1. Coefficient of labor capacity with accounting output (these are included in the manual);

4.8. Costs for fuel and energy per unit of calculation $= \dfrac{4.6 \cdot 100 \cdot 4.8.1}{4.7}$;

5. Calculation of earnings;
5.1. Hourly rate of the first category of workers-contractors (these are included in the manual);
5.2. The average tariff coefficient of workers-contractors (these are included in the manual);
5.3. Production program in working hours, calculated per year (these are included in the manual);
5.4. Direct fund of wages of workers-contractors = 5.1·5.2·5.3;
5.5.1. Quantity of the main workers of the i-th category (these are included in the manual);
5.5.2. The number of auxiliary workers of the i-th category (these are included in the manual);
5.5.3. Hourly rate of the main workers of the i-th category (these are included in the manual);
5.5.4. Hourly rate of auxiliary workers of the i-th category (data are included in the manual);

5.5.5. Tariff fund of basic salaries of full-time employees $= \sum_{i=1}^{n}$ 5.5.1 ·5.5.3·4.5.3;

5.5.6. Tariff fund of wages of auxiliary workers = temporary workers $= \sum_{i=1}^{n}$ 5.5.2 ·5.5.4·4.5.3;

5.6. Quantity of reserve workers (data are included in the manual);
5.7. The average tariff coefficient of reserve workers (these are included in the manual);
5.8.1. Percentage surcharge for reserve work (these are included in manual labor);
5.8.2. Daily tariff rate for workers of the first category (these are included in the manual);

5.8. Additional payments to reserve workers for qualification $= \dfrac{5.8.1}{100} \cdot 5.8.2 \cdot 5.7 \cdot 5.6$;

5.9. Additional payments to reserve workers for the performance of work on operations= 5.8.2·(5.7 - 5.2)·5.6;
5.10. Hourly wage fund of workers-contractors = 5.4 + (5.8 + 5.9)·4.5.4;
5.11.1. Percentage surcharge up to daily expenses for non-working time during the working day (these are included in handicrafts (0.25));

5.11. Daily fund of workers' salaries $= 5.10 + \dfrac{5.10 \cdot 5.11.1}{100}$;

5.12. Daily fund of salary of workers-substitutes $= \underline{5.5.5} + \dfrac{\underline{5.5.5} \cdot \underline{5.11.1}}{100}$;

5.22. Daily fund of wages of auxiliary workers $= \underline{5.5.6} + \dfrac{\underline{5.5.6} \cdot \underline{5.11.1}}{100}$;

5.13.1. Percentage premium to the monthly fund (these are included in the manual (9.64));

5.13. Monthly salary of workers $= \underline{5.11} + \dfrac{\underline{5.11} \cdot \underline{5.13.1}}{100}$;

5.14. Monthly fund of wages of workers-substitutes $= \underline{5.12} + \dfrac{\underline{5.12} \cdot \underline{5.13.1}}{100}$;

5.23. Monthly fund of wages of auxiliary workers $= \underline{5.22} + \dfrac{\underline{5.22} \cdot \underline{5.13.1}}{100}$;

5.20. Annual salary fund of workers-contractors = 5.13;
5.21. Annual salary fund of employees-part-time = 5.14·4.5.4;
5.24. Annual salary fund for auxiliary workers = 5.23·4.5.4;
5.15. Basic salary of production workers = 5.10 + 5.5.5·4.5.4;
5.16. Additional earnings for production workers = (5.13 + 5.14·4.5.4) - 5.15;
5.17.1. Rate of the single social tax (these are included in the manual tax (ECN = 0.26));
5.17. Dimensions of deductions on ECN = (5.15 + 5.16)·5.17.1;
5.18. Costs on the main and additional earnings per calculation unit, including deductions on ECN =

$$= \dfrac{\underline{5.15} + \underline{5.16} + \underline{5.17}}{\underline{4.7.1} \cdot \underline{4.7.2}} \cdot 100 \cdot \underline{4.8.1} ;$$

5.19. Expenses on the basic salary on the calculation unit $= \dfrac{\underline{5.15}}{\underline{4.7.1} \cdot \underline{4.7.2}} \cdot 100 \cdot \underline{4.8.1}$;

5.20. Variable costs = 4.2 + 4.4 + 4.8 + 5.18;
Algorithm for calculating constant losses:
6.1. Coefficient, taking into account the costs of preparation and development of production (these are included in the manual);
6. Costs for preparation and development of production = 5.19·6.1;
7. Calculation of costs for the maintenance and operation of equipment:

7.1. Basic and additional salary of auxiliary workers $= \underline{5.24} + \dfrac{\underline{5.24} \cdot \underline{5.17.1}}{100}$;

7.2.1. Cost of technological equipment $= \sum\limits_{i=1}^{n}$ Quantity of i-th technological equipment·Price of i-th equipment;

7.2.2.1. Coefficient, taking into account the cost of installation (these are included in the manual (0.1));
7.2.2. Cost of technological equipment with cost of installation = 7.2.1·7.2.2.1 + 7.2.1;
7.2.3. Cost of equipment = 7.2.2·7.2.2.1;
7.2.4. The cost of the equipment = 7.2.2 + 7.2.3;
7.2.5. Percentage deductions to the repair fund (data are included in the manual (8%));
7.2. Expenses for the repair fund of equipment = 7.2.4·7.2.5;
7.3.1. Depreciation rate of technological equipment (these are included in the manual (10%));
7.3.2. Depreciation rate of other equipment (these are included in the manual (7.7%));
7.3. Depreciation deductions on the repair fund = 7.2.2·7.3.1+ + 7.2.3·7.3.2;
7.4.1.1. Percentage deductions for low-value and fast-moving tools (data are included in the manual (0.05));
7.4.1. Cost of low-value and fast-moving tools = 7.2.2·7.4.1.1;
7.4.2.1. Percentage of deductions for the restoration of low-value and fast-moving tools (data are included in the manual (20%));
7.4.2. Expenditures on the restoration of low-value and fast-moving tools = 7.4.1·7.4.2.1;
7.4. Expenditures on low-value and fast-moving tools = 7.4.1 + 7.4.2;
7.5.1. Cost of i-th models (data are included in the manual);

7.5.2. Annual volume of issue $= \sum\limits_{i=1}^{n} \underline{7.5.1} \cdot 4.7$;

7.5.3. Percentage of deductions per intra-production transfer (these are included in the manual transfer (0.82%));

7.5. Costs for intramuscular transfer = 7.5.2·7.5.3;

7.6. Expenditures on maintenance and operation of equipment = 7.1 + + 7.2 + 7.3 + 7.4 + 7.5;

7.7.1. Percentage of deductions for other expenses (these are included in the manual (10%));

7.7. Other expenses = 7.6·7.7.1;

7.8. Total cost of maintenance and operation of equipment = 7.6 + 7.7;

7. Costs for content and operation of equipment per cost unit $= \dfrac{7.8 \cdot 100}{\underline{4.7.1} \cdot \underline{4.7.2}} \cdot \underline{4.8.1}$;

8. Calculation of general production costs:

8.1.1. Quantity of managers, specialists, employees of the i-th position (these are included in the manual);

8.1.2. Salary in the month of i-th position (given contributions to the hand);

8.1.3. Annual salary fund of managers, specialists, employees $= \sum\limits_{i=1}^{n} (8.1.1 \cdot 8.1.2) \cdot 12$, where 12 - the number

of months in a year;

8.1. Basic and additional salary of managers, specialists, employees $= \underline{8.1.3} + \dfrac{\underline{8.1.3} \cdot \underline{5.17.1}}{100}$;

8.2.1. Price for 1 m2 buildings (these are brought into the hand);

8.2.2. Production area of the building (these are brought into the handrail);

8.2.3. Capital investments in the building = 8.2.1·8.2.2;

8.2. Depreciation of buildings and constructions on full recovery = 8.2.3·0,012, where 1,2 - depreciation rate of buildings and constructions on full restoration;

8.3.3.1. Conditional coefficient, characteristic of fuel consumption per kg of heating 1 m2 per day at different temperatures in one degree (these are introduced into the hand (0.02));

8.3.3.2. The volume of the production building (these are included in the manual);

8.3.3.3. The length of the heating period, the days (these are included in the hand (186));

8.3.3.4. Temperature inside the premises (these are introduced into the hand (18));

8.3.3.5. The temperature of the external air is the average for the heating period (these are included in the manual (6));

8.3.3.6. Price per unit of fuel (these are included in the manual);

8.3.3. Heating costs $= \dfrac{\underline{8.3.3.1} \cdot \underline{8.3.3.2} \cdot \underline{8.3.3.3} \cdot (\underline{8.3.3.4} + \underline{8.3.3.5}) \cdot \underline{8.3.3.6}}{1000}$;

8.3.4. Quantity of lamps (data are included in the manual);

8.3.5. Price for 1 kW·h (these are brought into the hand);

8.3.6.1. Power of lamps (these are included in the manual (75));

8.3.6. Costs on local lighting $= \dfrac{\underline{8.3.6.1} \cdot \underline{8.3.4} \cdot \underline{4.5.4} \cdot \underline{4.5.3} \cdot \underline{8.3.5}}{1000}$;

8.3.7. The norm of enlightenment 1 m2 production area (data are introduced manually);

8.3.8. Expenses on general lighting $= \dfrac{\underline{8.3.7} \cdot \underline{8.2.2} \cdot \underline{4.5.3} \cdot \underline{4.5.4} \cdot \underline{8.3.5}}{1000}$;

8.3.9. The cost of lighting = 8.3.6 + 8.3.8;

8.3. Costs of the building = 8.3.3 + 8.3.9;

8.4.1. Percentage of deductions for the repair fund of the building (these are included in the manual (3%));

8.4. Expenses on the repair fund of buildings and structures = 8.2.3·8.4.1;

8.5. Labor protection costs = 8.5.1·(8.5.3 + 8.5.4);

8.6. General production costs = 8.1 + 8.2 + 8.3 + 8.4 + 8.5;

8.7. Other expenses = 8.6·0.1;

8.8. Total costs for general production costs = 8.6 + 8.7;

8. Expenditures on public production costs per unit of calculation $= \dfrac{8.8 \cdot 100}{\underline{4.7.1} \cdot \underline{4.7.2}} \cdot \underline{4.8.1}$;

9.1. Percentage of deductions per household expenditures (data are included in handicrafts (290%));

9. General expenses = 5.19·9.1;

10. Constant costs = 6 + 7 + 8 + 9;

11. Production self-sufficiency = 4 + 10;

12.1. Percentage of deductions for commercial expenses (data are included in the manual (1%));

12. Commercial costs = 11·12.1;

13. Full self-sufficiency = 11 + 12;

14. Interest on loans included in self-sufficiency (data are included in manual);

15. Profit before tax deduction = 3 - 4 - 10 - 8.2 - 7.3 - 14;

16.1. Profit rate on profit (these are levied manually (20%));

16. Taxes and fees = 15·16.1;

17. Net income = 15 - 16;

18. Depreciation = 8.2 + 7.3;

19. Pure flow from operational activity = 17 + 18.

The implementation of this algorithm can be done with the help of a software product Microsoft Excel, installed in the workplace of practically any specialist.

For this calculation it is important to differentiate the data involved in the calculation. For the calculation of self-sufficiency of the specific output models are constant and variable data, which depend on the production equipment, the composition of the main and auxiliary materials, including. In an Excel spreadsheet, these cells are highlighted with a blue color. In the process of monitoring the sale of a specific model, these data remain unchanged. For other models, these data are corrected.

The calculation also contains data that do not depend on the model and are included in the calculation table once. They are highlighted with a green flower. Calculated formulas in the table are highlighted in yellow color, recalculated according to it is performed automatically when changing the source data. Basic source data, which are used in the monitoring process, are the unit price of the product and the volume of sales. Thus, the calculation can be made daily or in the chosen time range, with only the sales volume and unit price of the item for a given period, we will receive the flow of money for this period. Algorithm for calculating the receipt of cash from operating activities is presented in Table 10

Table 10. Algorithm for calculating the receipt of funds from operational activities

Name of the indicator	Ed. measurements	The value of the indicator
1	2	3
Sales volume	par	12656
The unit price of the item	руб.	974,58
Vyruchka	руб.	= D5·D6
Calculation of variable costs		= D13 + D16 + D29 + D61
Raw materials and basic materials	руб.	42224
Coefficient that takes into account transport costs	%	0.15
Raw materials and basic materials with accounting for transportation costs	руб.	= D11·D12 + D11
Auxiliary materials	руб.	3594,37
Coefficient that takes into account transport costs	%	0.1
Auxiliary materials with accounting for transportation costs	руб.	= D14·D15 + D14
The total power of the installed equipment	kW	76.27
Equipment load factor		0.89
Duration of shifts	час	8
The number of working days per year	days	249
Loss of energy when transferring		0.85

Annual amount of electricity consumed for technological purposes	kW * h	= (D17·D18·D19·D20) / D21
Price 1 kW	руб.	3.6
Expenditures on fuel and energy	руб.	= D22·D23
The number of working days in which the model is issued	days	56
Issue of products in a shift	par	678
Issue of publications per year	par	= D25·D26
Coefficient of employment with accounting for graduation		0.224
Expenditures on fuel and energy per unit of calculation	руб.	= (D24·100·D28) / D27
Calculation of salary		
Hourly rate for 1st category of workers-contractors	руб.	50
The average tariff coefficient of workers-contractors		= 'Sr.tar.koef-ty and Tar. fund ZP '! E12
Production program in working hours, calculated per year	час	153339,19
Direct fund of wages of workers-contractors	руб.	= D33·D34·D35
Tariff fund of salary of the main employees	руб.	= 'Sr.tar.koef-ty and Tar. fund ZP '! F22
Tariff fund of wages of auxiliary workers-contractors	руб.	= 'Sr.tar.koef-ty and Tar. fund ZP '! F32
The number of reserve workers	чел.	11
The average tariff rate for reserve workers		1,469
Percentage surcharge for reserve workers	%	0.15
Daily rate for workers of the first category	руб.	400
Additional payments to reserve workers for qualification	руб.	= D41·D42·D39·D40
Additional payments to reserve workers for the performance of work on operations	руб.	= D42·(D40-D34)·D39
The hourly wage fund of workers-contractors	руб.	= D36 + (D43 + D44) * D20
Percentage surcharge up to daily expenses for non-working time during working days	%	0.25
Daily fund of wages of workers-contractors	руб.	= D45 + (D45·D46) / 100
Daily fund of wages of subordinates	руб.	= D37 + (D37·D46) / 100
Daily fund of wages of auxiliary workers	руб.	= D38 + (D38·D46) / 100
Percentage surcharge to the monthly fund	%	9.64
Monthly salary fund of workers-contractors	руб.	= D47 + (D47·D50) / 100
Monthly fund of wages of employees	руб.	= D48 + (D48·D50) / 100
Monthly fund of wages of auxiliary workers	руб.	= D49 + (D49·D50) / 100
Annual salary fund of workers-contractors	руб.	= D51

Annual fund of wages of subordinates	руб.	= D52·D20
Annual salary fund for auxiliary workers	руб.	= D53·D20
Basic salary of production workers	руб.	= D45 + D37·D20
Additional earnings for production workers	руб.	= (D51 + D52·D20) -D57
The rate of the single social tax	%	0.26
The size of deductions on the ECN	руб.	= (D57 + D58)·D59
Costs per osn and dop ZP on the calculation unit including deductions on ESN	руб.	= (D57 + D58 + D60) / (D25·D26)· ·100·D28
Expenses on the basic salary for the calculation unit	руб.	= D57 / (D25·D26)·100·D28
Calculation of constant losses		= D67 + D93 + D126 + D128
Coefficient, taking into account the cost of preparation and development of production	%	0.02
Costs of preparation and development of production	руб.	= D62·D66
Calculation of costs for the maintenance and operation of equipment		
Basic and additional salary for auxiliary workers	руб.	= D56 + D56·D59
Cost of technological equipment	руб.	3772900
Coefficient, taking into account the cost of installation	%	0.1
The cost of technological equipment with the cost of installation	руб.	= D70·D71 + D70
The cost of other equipment	руб.	= D72·D71
The cost of this equipment	руб.	= D72 + D73
Percentage of deductions to the repair fund	%	0.08
Expenses for the repair fund of equipment	руб.	= D74·D75
Depreciation rate of technological equipment	%	0.1
Depreciation rate of other equipment	%	0.077
Depreciation is charged to the repair fund	руб.	= D72·D77 + D73·D78
Percentage deductions for low-value and fast-moving tools	%	0.05
The cost of low-value and fast-moving tools	руб.	= D72·D80
% deductions for restoration of low-value and fast-moving tools	%	0.2
Expenditures on the restoration of low-value and fast-moving tools	руб.	= D81·D82
Expenditures on low-value and fast-moving tools	руб.	= D81 + D83
The cost of the product	руб.	= G81
Annual volume of issue	руб.	= G86
Percentage deductions for in-house relocation	%	0.0082
Costs of intra-industrial migration	руб.	= D86·D87

Expenditures on maintenance and operation of equipment	руб.	= D69 + D76 + D79 + D84 + D88
Percentage of deductions for other expenses	%	0.1
Other expenses	руб.	= D89·D90
All costs for maintenance and operation of equipment	руб.	= D89 + D91
Costs for content and operation of equipment on a costing unit	руб.	= (D92·100) / (D25·D26)·D28
Calculation of general production costs		
Annual salary fund of managers, specialists, employees	руб.	= 'Annual fund ZP'! C22
Basic and additional salary of managers, specialists, employees	руб.	= D97 + (D97·D59)
Price for1 m2 buildings	руб.	1800
Production area of the building	m2	861.72
Capital investments in the building	руб.	= D99·D100
Depreciation rate of buildings and constructions on full restoration	%	0.012
Depreciation of buildings and structures on full restoration	руб.	= D101·D102
Conditional coefficient, characteristic of fuel consumption per kg of heating1 m2per day at different temperatures in one degree		0.02
Volume of production facilities occupied by production streams	m3	2757,504
The length of the heating period	days	186
Temperature inside the premises	degrees	18
Outdoor air temperature is average for the heating period	degrees	6
Price per unit of fuel	руб.	595
Heating costs	руб.	= D104·D105·D106·(D107 + D108)·D109 / 1000
Quantity of lamps	шт.	70
Price for 1 kWh	руб.	3.6
The power of lamps	W.	75
Costs on local lighting	руб.	= (D113·D111·D19·D20· ·D112) / 1000
The norm of enlightenment1 m2production area	W.	13
Expenditures on general lighting	руб.	= (D115·D100·D19·D20· ·D112) / 1000
The cost of lighting	руб.	= D114 + D116
Costs on the content of the building	руб.	= D110 + D117
Percentage of deductions for the repair fund of the building	%	0.03

Expenses on the repair fund of buildings and structures	руб.	= D101·D119
Costs of labor protection	руб.	31500
General production costs	руб.	= D98 + D103 + D118 + D120 + D121
Percentage of deductions to the repair fund	%	0.1
Other expenses	руб.	= D122·D123
All costs are borne by the general production costs	руб.	= D122 + D124
Expenditures on public production costs per unit of calculation	руб.	= (D125·100) / (D25·D26)·D28
Percentage of deductions for household expenses	%	2.9
Household expenses	руб.	= D62·D127
Production self-sufficiency	руб.	= D9 + D64
Percentage deductions for commercial expenses	%	0.01
Commercial expenses	руб.	= D129·D130
Full self-sufficiency	руб.	= D129 + D131
Interest on loans included in self-sufficiency	руб.	
Profit before tax deduction	руб.	= D7-D9-D64-D103-D79-D133
Profit tax rate on profit	%	0.2
Taxes and fees	руб.	= D134·D135
Net income	руб.	= D134-D136
Depreciation	руб.	= D103 + D79
Pure intoxication from operational activities	руб.	= D137 + D138

The conclusion

Thus, footwear enterprises should be oriented as external (consumer enterprises, competition, market conjuncture, etc.), as well as internal factors, such as the volume of profitability, profitability, coverage. However, it is impossible to take into account and anticipate all situations that can arise during the implementation of shoes, ie. some models of shoes at a certain stage are not used in demand. In this case, it is necessary to show another, not usually advertised side of marketing: if the shoe, let alone without taking into account the requirements of the market, has already been produced, then it must be implemented. For this purpose, in order to react to the lower prices of competitors, it is necessary to reduce too many stocks, to be free from damaged, defective footwear, to liquidate the remnants, to attract large amounts of food; using this discount. There are an order of twenty different types of discounts, but for the most common types of discounts there are some types of discounts that are used at different levels of enterprises, subsistence organizations, trade. Therefore, the use of discounts by the enterprise can go to the initial reduction of prices in the event of overload of production capacity, the reduction of the market share due to the failure of competition with the parties-competitors, etc. In this case, the company takes care of its own efforts, developing activities to reduce them at the expense of improving equipment and technology, the introduction of new types of materials, the constant improvement of production quality. And all this requires from companies with large financial losses, but not the least, contributes to the increase of competitiveness of individual types of products from the skin and the enterprise as a whole. In addition, the greater the number of issued footwear products, the greater the degree of reduction of production, which leads to a reduction in prices, and most importantly - creates such conditions for the functioning of the market, which will not be able to reap the benefits.

With the transition to a new economy, improving the quality and competitiveness of leather products has become a strategic task for all leather and shoe enterprises in the country and the region as a whole, there is a need to take into account the laws and market requirements, master a new type of economic behavior, adapt all aspects of their activities to the changing situation, should take into account changes in consumer demand with the withdrawal of interests of consumers before the industry. Fulfillment of these

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tasks is possible only on the basis of deep research by manufacturers of domestic footwear products, the needs of hotel groups (consumer segments), methods of examination of quality and competitiveness. The position in the shoe industry of UFO and SKFO is not in the last queue and the result is the incompetence of many managers of UFO and SKFO shoe companies. Therefore, the complicated situation led to the development of strategies for the development of competitive production of leather products in the UFO and SKFO.

The issues related to the development of domestic shoe production in UFO and SKFO were considered. The results of the conducted work revealed favorable conditions for the implementation of the strategy for the development of the required and competitive production:

large concentration of skilled labor force;

coordinated specialization of producers;

perennial shoe traditions;

a small number of local suppliers of quality raw materials, components;

high demand in UFO and SKFO for quality shoes.

We consider that for the development of domestic producers of competitive and demanded products it is necessary:

increase in investment attractiveness of the sector;

creation of conditions conducive to the improvement of the supply of material and raw materials;

protection of the domestic market from illegal trade in goods;

export stimulation;

legalization of preferential taxation of producers;

development of interconnected system of supply and demand, production-technological and innovation, pricing, finance, personnel policy and personnel management;

improvement of quality and design of the released product;

unification of all manufacturers for the promotion of footwear in the region;

development of a set of activities of regional significance aimed at improving the socio-economic situation at the expense of creating new jobs;

study of the life cycle of products and the use of advertising and the media;

enhancement of control and introduction of modern ISO quality management systems, development of dealership and distribution networks;

preferential lending within the framework of targeted federal and regional programs ("Family", "Children", "Motherhood");

expansion of leasing scheme practices;

at increased commercial risk and under certain conditions, the purposeful use of outsourcing.

In accordance with the strategy was developed a competitive assortment of men's, women's and children's footwear with a view to the factors affecting the consumer demand: compliance with the main trends in fashion, economic, social, economic and social. Within the framework of the developed strategy there will be organized production of competitive products with the use of modern mechanized innovative technological processes, as well as training to meet the needs of the elite consumer.

Innovative technological processes have been developed for the production of men's, women's and children's shoes using modern technological equipment with advanced nano technologies, forming the basis for reducing the cost of shoes and thereby increasing its competitiveness, produced by leading firms in the world, with the possibility of a wide assortment of shoes not only by species, but also by methods of fastening.

The layout of technological equipment is proposed, on the basis of which it is possible to form a technological process for the production of male and female, as well as children's shoes with optimal strength outside the production area. Given the algorithm for calculating the receipt of cash from the operational activities of footwear enterprises. Calculations were carried out on the basis of assessing the degree of implementation and dynamics of production and sales of products, determining the influence of factors on the change in the magnitude of these indicators, identifying on-farm reserves and developing measures for their development, which should be aimed at accelerating product turnover and reducing losses, which will achieve a significant economic effect.

The results of the sale of shoes in the month of different volumes were considered, namely: 100%, 80%, 50%. The results of the calculations show that at 100% sales of shoes, compensation is provided not only for the production and sale of shoes, but there is a net profit in the amount of 1900.54 thousand. rubles, which speaks about the effective activity of the enterprise, as well as about the proper marketing of the assortment policy of the enterprise. There will also be profit from the sale of 80% of men's, women's and children's shoes. In case of sale only 50% of the volume of production of the enterprise will be lost, that is, such an option will already be considered unsatisfactory and necessary conditions for the sale of shoes in the established period of 50% of the time.

Relying on the complex position in the economy of our country, on our view, there is a less significant problem of development of the regional consumer market, there is a lack of a full-fledged regulatory and legal framework, a provision for the functioning of the market. Going out of this, it is the federal and regional intervention that must correct the situation in the market of domestic footwear in the regions at the

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expense of the development of production of competitive and demanding leather products. Conducted analysis allows to suggest the following trends in the development of footwear production in UFO and SKFO:

1. Due to the high level of migration of the able-bodied population in UFO and SKFO in developing industries, the shoe industry in our districts can be rightly called developing.

2. In UFO and SKFO justified attention was paid to the issues of quality assurance by qualified specialists engaged in the leather and shoe industry (a large number of specialized training and educational institutions). An important factor is the increase in investment attractiveness of the sector, especially with the support of regional authorities, the creation of conditions to increase its competitiveness and attractiveness. It is necessary to introduce high duties on imported imported finished shoes and low duties on imported basic and auxiliary materials and equipment, and it is also necessary to regulate the level of prices and tariffs that would guarantee the manufacturer and trade in general reimbursement of costs and accumulation of funds for its modernization and increase the efficiency of the results of their activities.

Thus, the preconditions for the development of competitive production in our regions are significant and relevant, which implies the implementation of the following measures:

1. Creation of regional programs for the development and support of domestic manufacturers of shoes on the territory of UFO and SKFO (loans, investments, leasing, outsourcing).

2. Development of modern raw materials base of domestic industry.

3. Stimulation of the tax system for the modernization and reconstruction of existing production of footwear and the creation of new competitive production.

4. Improvement of financial condition and reassignment of not less than 50% of fixed assets.

5. Adoption of measures to reduce the import of imported shoes in the region and increase the quality of products with the export of up to 35%, which will ensure the elimination of smuggled and counterfeit shoes.

6. Recognition by the Government of the Russian Federation of the light industry sector is a priority among other industries and the adoption of the "breakthrough" development sector for the period. to 2025

7. Ensure a doubling to 2025 industrial production and shoe production up to 85 mln. par.

8. Competent development of marketing policy for regional footwear production with a guarantee of the best promotion of domestic footwear production in local markets and activation of the media in the federal, regional and municipal authorities.

The implementation of the planned measures will lead to the coverage of the deficit in all types of footwear, will increase the mobility of workers in the UFO and SKFO and reduce negative processes in the labor market, as well as a stable balance of federal and regional interests.

In our opinion, for the successful realization of all the above-mentioned measures in the highest degree of interest of municipal and regional branches of the government in the development of production of products from the skin, the skin of the skin, the skin of the skin, the skin of the skin. Thus, all this in combination allows us to provide our enterprises with a wonderful future and sustainable position as internally, as well as in the markets of near and far abroad. Need only kindness and interest of all participants of this association.Modern market relations dictate the need to increase the competitiveness of products by assisting in the production of new or improved goods and services at the expense of using innovative and design technologies.

The study of market conditions, the need for timely updates of the range require the introduction of flexible automation as a priority area of innovation. In other words, complex flexible automation with the widespread use of information technology and computer systems is the core of their effectiveness in innovation.

Specifics of shoe enterprises require to have full operational, normative and information support of design and technological preparation of production. At the present time, the weakest point of the enterprise is the low level of information support of technological preparation of production. TPP -weight is a laborious process that requires a large amount of time. so, the labor capacity of technological preparation in relation to the total labor productivity of the technical project of products in a single production is 20–25%, in series - 50–55%, and in large series and mass - 60–70%. This is due to the fact that if you move from a single production to serial and further to mass, then the degree of technological property increases, and, consequently, increases and the volume of work on TP.

The resignation of the level of automated production system of technological preparation (ASTPP) from the system of automated design of design work (CAD KR) is explained by several objective reasons,the most significant of which are included in the fact that CAD KR is universal, can be applied without any practical adaptation to virtually any enterprise; ASTPP, on the contrary, specializes and depends on the nature of production, the type of product produced. In addition, ASTPP is heterogeneous in purpose, it is formed from a set of products, each of which ensures the development of a separate type of technological process. The work of the leading universities of our country is aimed at the

automation of TPP leather goods, the collection of blanks, the selection of materials, software design, optimal planning of technological processes of shoe factories, and the process of sorting out the process of automation. Therefore, raises the need for the creation of information support on the basis of universal data bases, with the aim of reducing labor intensity and increasing the efficiency of work at the stage of technological preparation of production at their expense. In modern conditions of market economy with rapidly changing policy the demand can exist only those enterprises that are able to correctly respond to changes in market conditions and timely to promote their products. For shoe production, such a reaction occurs in the fast and frequent shift of the range, which is associated with the preparation of the corresponding production process to the conditions of operation of the enterprise. In modern conditions of market economy with rapidly changing policy the demand can exist only those enterprises that are able to correctly respond to changes in market conditions and timely to promote their products. For shoe production, such a reaction occurs in the fast and frequent shift of the range, which is associated with the preparation of the corresponding production process to the conditions of operation of the enterprise. Under modern conditions of a market economy, a rapidly changing policy of demand can exist only those enterprises that are able to properly respond to changes in the conditions of the market and timely to promote their products. For shoe production, such a reaction occurs in the fast and frequent shift of the range, which is associated with the preparation of the corresponding production process to the conditions of operation of the enterprise.

An important place among the composite parts of technological training of shoemaking production is the design of technological processes, which is carried out at the present time. Solving technological tasks, specialists go mainly out of their own practical skills, which contributes to their subjective approach to design, reducing its quality. Depending on the knowledge, experience and analytical skills of the technologist can form different installations and combine them in different ways, following what is basically the same and the same information about the properties of the shoemaker.

Thus, the purpose of the study is to reduce the cost of labor and increase the quality of technological training of production at the expense of creating an automated system for designing technological processes of competitive production and demand.

As an object of research, a technological process of assembling shoes by the method of fastening was chosen.

The choice is based on the following:

— In the first place, the question of automated selection of the technological process of assembling shoes has not yet received sufficient attention. Until now, the work of the leading universities of the country was focused on the automation of TPP leather goods, the selection of materials, the discovery of shoe materials, the collection of blanks, the process of assembling and assembling, the process of assembling shoes. unexplored area;

— secondly, the adhesive method of fastening in the present time is the most common and popular as among the manufacturers of shoes (drawings), as well as among consumers (drawings). The advantages of the adhesive method of fastening are: high productivity, simplicity of equipment, wide possibilities of mechanization and automation of the gluing process, flexibility of production. An important merit of the glue method of fastening is its versatility - the ability to create any design from materials with the help of adhesives in the glue industry. Glue method is less material-intensive, less labor-intensive, high-strength method of fastening.
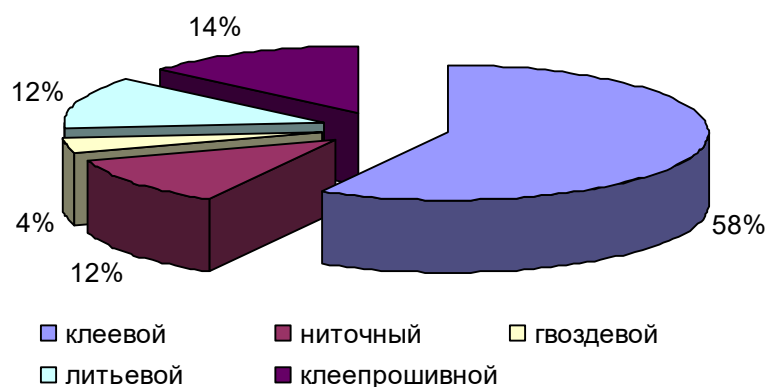
Picture 1. Diagram of the distribution of the issue of shoes by different methods of fastening shoes

Impact Factor:	ISRA (India) = **6.317**	SIS (USA) = **0.912**	ICV (Poland) = **6.630**
	ISI (Dubai, UAE) = **1.582**	РИНЦ (Russia) = **3.939**	PIF (India) = **1.940**
	GIF (Australia) = **0.564**	ESJI (KZ) = **9.035**	IBI (India) = **4.260**
	JIF = **1.500**	SJIF (Morocco) = **7.184**	OAJI (USA) = **0.350**

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STUDY OF THE PROCESS OF OBTAINING MODIFIED SULFUR CONCRETE BASED ON LOCAL RAW MATERIALS AND STUDY OF RADIONUCLIDES OF SULFUR CONCRETE AND PORTLAND CEMENT

Abstract: The article explores the process of obtaining modified sulfur concrete based on local raw materials and the study of radionuclides of sulfur concrete and Portland cement. The novelty of the work was determined by the amount of radionuclides Ra-226, Th-232, K-40 in sulfur concrete and Portland cement. Considering the advantage and convenience of sulfur concrete, it was analyzed on a gamma spectrometer. Accordingly, the test conditions are: T-22°C, humidity -63%, illumination-300 lux, specific activity Bq /kg. According to SanPiN 0193-06, they are used in construction at a level of less than 350 Bq / kg. In the analysis of sulfur concrete, its radionuclides averaged 127 Bq /kg. Sulfur concrete contains modifier-26%, sand-54%, ash (ash) -16% and various metal oxides - 4%. Additives and fillers added to sulfur concrete, ie radionuclides in sand and gravel were analyzed using gamma spectrometry.
Key words: Sulfur, modified sulfur, crotonic aldehyde, modification, gamma spectrometer, sulfur concrete.
Language: English

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Introduction

The consumption of fossil fuels is growing rapidly around the world, as is the amount of sulfur that is formed as a by-product of the process of industrial purification of fuel raw materials. Since the sulfur content is expected to increase steadily in the future, huge waste disposal costs will be required in the absence of a counter plan. Therefore, when modifying sulfur, it is important to synthesize sulfur-containing binders and obtain new types of modified sulfur concrete on their basis in order to obtain durable building materials, such as asphalt and concrete, resistant to various aggressive environments.

Today, in the industrialized countries of the world, much attention is paid to research aimed at obtaining modified sulfur concrete and its use to increase the strength of building structures. Therefore, the development of organic modifiers for the effective polymerization of sulfur, the production of thermoplastic composites based on sulfur and mineral fillers, the prevention of solid-phase transitions and volume reduction due to temperature changes in sulfur concrete , the elimination of the combustibility of compositions based on modified sulfur, it is required to develop effective methods for obtaining durable polymeric sulfur concrete stable at high concentrations of acids and salts based on modified sulfur with unsaturated organic compounds.

Certain scientific and practical results have been achieved in the republic on the creation of sulfur binders and sulfur concretes based on modified sulfur and sulfur waste from the gas and oil processing industry. On the basis of the normative measures taken in this direction, certain results have been achieved, especially in the development of scientific foundations for the production of polyfunctional compositions, large-scale measures have been taken in the field of providing the local market with imported products.

Portland cement requires limestone to be heated in kilns at over 1400 $^{\circ}$ C for several hours to form clinker materials. Due to the fact that fossil fuels are burned to fire kilns and the stoichiometric release of carbon dioxide when limestone is converted to calcium oxide, this process generates about one ton of carbon dioxide for every ton of cement and accounts for 5% of global anthropogenic CO_2 production [1; pp . 303-329, 2]. Unlike traditional cement production, sulfur-based cement production does not depend on high energy or direct carbon dioxide emissions [3 , 4; pp. 159-175, 5]. In addition, sulfur is in net excess on a global scale. Sulfur is the third most common chemical element in oil at concentrations greater than

10 wt %, and its extraction from oil and gas processing is carried out in accordance with environmental restrictions [6 ; pp. 53-57]. Thus, a large amount of sulfur is available as a by-product of these processes [3]. Also, since sulfur itself is an industrial by-product, a significant amount of carbon dioxide emissions can be reduced by using sulfur-based concrete. Sulfur-based concrete is a thermoplastic composite of mineral fillers and sulfur. Early studies using elemental sulfur have shown that it has serious durability issues such as repeated freeze and thaw cycles [7, 8; pp. 606-621, 9; pp. 363-367, 10 ; pp. 31-53]. When sulfur and filler are hot mixed and cooled to cast sulfur concrete products, the liquid sulfur binder initially crystallizes into monoclinic sulfur (S_b). As it continues to cool, the material undergoes a solid phase transition to rhombic sulfur (S_a), which causes the material to shrink in bulk. This decrease in volume creates internal stress and causes durability problems, especially when subjected to freeze cycles. Therefore, chemical modifiers that polymerize sulfur to reduce or eliminate solid state transition and thus increase the durability of sulfur-based concrete have been previously studied [3; 11 ; pp. 186-194 , 12 ; pp. 27-38]. This modified sulfur concrete is called polymeric sulfur concrete (PSB). It has been used as a building material due to its excellent resistance to acid and salt environments. It is also known that this binder effectively stabilizes /hardens contaminated soils [13; pp. 441-447 , 14 ; pp. 327-333] or nuclear waste [4 ; pp. 159-175 , 15; 16]. Unlike conventional hydraulic cementitious concretes, PSB does not require water and can reach full strength in a matter of days, compared to 28 days for conventional Portland cement based concretes.

Several organic chemical modifiers have been developed to polymerize sulfur efficiently. Commonly used modifiers are dicyclopentadiene (DCPD), a combination of DCPD, cyclopentadiene and dipentene [10 ; pp. 31-53 , 17 ; pp. 105-113 , 18 ; pp. 13-18], olefinic polysulfide [9 ; pp. 363-367] and 5-ethylidene-2-norbornene (ENB) and/or 5-vinyl-2-norbornene (VNB) [3]. When treated with molten sulfur, the unsaturated hydrocarbons in the organic modifiers break down liquid S8 rings and react to form long chain polymers. Polymerized linear sulfur chains improve durability. Although modified concrete is environmentally sustainable and durable, the high cost of these organic modifiers has prevented its widespread use in the construction industry [11 ; pp. 186-194].

Sulfur has been used as a molten binding agent for quite some time in human history. The use of

sulfur was mentioned in the literature of Ancient India, Greece, China and Egypt [19 ; pp. 15-17]. For example, sulfur was one of the raw materials for the production of gunpowder by the ancient Chinese [20]; sulfur was also used to fix metal in stone in the 17th century [21]. Since the 1920s, sulfur concrete has been used as a building material [22]. Various researchers and engineers studied and managed to obtain high-strength and acid-resistant sulfur concrete [23; pp. 65-72, 24; pp. 1026-1028, 25 ; pp. 583-586]. In the late 1960s, Dale and Ludwig pointed out the importance of well graded aggregates for optimum strength [26, 27].

Considering the advantage and convenience of sulfur concrete, we analyzed it on a gamma spectrometer . Accordingly, test conditions: T-22 °C , humidity -63%, illumination-300 lux, specific activity Bq/kg.

0193-06, they are used in construction at a level of less than 350 Bq / kg. In the analysis of sulfur concrete, its radionuclides averaged 127 Bq/kg. Sulfur concrete contains a modifier - 26 %, sand - 54 %, ash (ash) - 16 % and various metal oxides - 4 %. Additives and fillers added to sulfur concrete, i.e. radionuclides in sand and gravel were analyzed using gamma spectrometry . Accordingly, test conditions: T-22`C, humidity -63%, illumination-300 lux, specific activity Bq / kg (tables 1.1 - 1.4) [28 ; pp. 202-205].

Table 1.1. Analysis of radionuclides in sulfur concrete using a gamma ray spectrometer.

Name	Ordinal room sample	Ra-226	Th-232	K-40	Aeff .	Aeff.m
sulfur concrete	1	9.11	36.9	84.1	64.6	136
	2	10.2	35.1	84.7	63.4	130
	3	14.0	29.5	85.7	59.9	119
	4	11.2	36.2	82.5	65.6	128
	5	18.1	31.8	84.0	66.9	122
	Medium _	12.5	33.9	84.0	Aeff avg = 64.08	Aeff . m medium=127 Bq / kg

Table 1.2. Analysis of radionuclides in sand with a gamma ray spectrometer.

Name	Ordinal room sample	Ra-226	Th-232	K-40	Mistake detection , %	Aeff . Bq / kg
Sand	1	20.9	6.86	25.3	6.2-10.8%	91.1
	2	22.6	3.86	25.9	6.2-10.9%	122
	3	19.5	5.87	27.5	5.8-10.3%	97.6
	4	21.3	4.12	26.4	6.0-10.4%	114
	5	21.1	4.47	25.1	6.1-10.2%	109
Aeff.m = 107 Bq / kg						

Table 1.3. Analysis of radionuclides in "rubble" on a gamma spectrometer.

| Name	Ordinal room sample	Ra-226	Th-232	K-40	Mistake detection , %	Aeff . Bq / kg
rubble	1	20.3	5.17	25.9	6.2-10.8	103
	2	20.5	4.02	49.8	6.2-10.9	175
	3	19.6	4.03	27.9	5.8-10.3	114
	4	17.8	5.49	39.9	6.0-10.4	96.4
	5	20.6	3.28	41.3	6.1-10.2	129
Aeff.m = 123.48 Bq / kg						

Portland cement M-500 was also analyzed on the MKS -AT-1315 gamma spectrometer. Accordingly, test conditions: T-22 °C, humidity -63%, illumination-300 lux, specific activity Bq/kg. In addition to the detection of sulfur concrete mixtures, various fine aggregates such as "fine sand", "washed sand" and manufactured sand replacing 0%, 25%, 50%, 75% and 100% sulfur concrete were also studied in the above study. The durability of each type of fine-grained sulfur concrete with the best compressive strength has been studied [29 ; pp. 34-39].

Table 1.4. Analysis of radionuclides in Portland cement M-500 on a gamma spectrometer .

Name	Ordinal room sample	Ra-226	Th-232	K-40	Mistake detection , %	Aeff . Bq / kg
Portland cement M-500	1	27.5	5.68	25.0	62.5	112
	2	24.0	7.37	24.2	73.4	97.3
	3	22.8	5.42	24.4	74.6	103
	4	21.3	2.93	36.0	68.9	133
	5	20.2	3.00	22.5	67.8	125
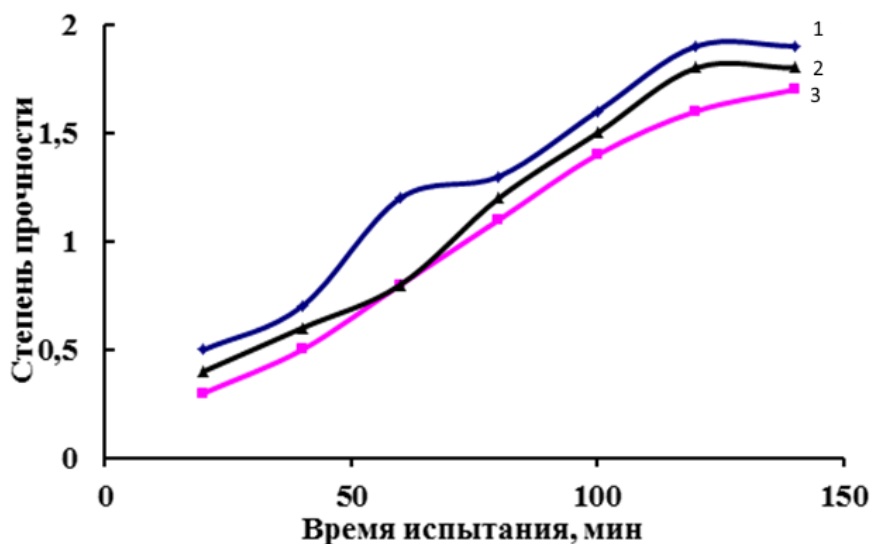
1 - Crushed stone, 2 - Portland cement, 3 - Sulfur concrete
Fig. 1 . The level of strength of concrete obtained on the basis of sulfur concrete , sand, crushed stone and Portland cement M-500.

This graph tests the strength of concrete based on sulfur concrete , sand, crushed stone and Portland cement M-500. It is shown that the strength of sulfur concrete does not differ from the strength of other types of concrete. To determine the superiority of sulfur concrete over cement concrete, water absorption, resistance to various chemical environments, and rapid penetration of chloride ions were tested. The result shows that sulfur concrete can be used in rooms with high humidity, where acid activity is higher. Sulfur concrete gives a result similar to ordinary concrete (Fig. 1). Another advantage of sulfur concrete is that any fine aggregate can be used as aggregate in sulfur concrete, as it is a waterproof type of concrete.

Thus, the results of gamma spectrometric studies carried out on all of the above samples comply with the requirements of sanitary regulations No. 0193-06. The results obtained can be used in housing construction with a gamma spectrometer up to 300 Bq/kg. If <350 Bq/kg, it can be used for street fences, ditches, underground pipe protection devices, paved roads (Paving stones)[30 ; pp. 202-205].

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QR – Issue   QR – Article

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FORMS OF PROMOTION OF THE UZBEK BRAND IN ABROAD ON THE BASIS OF SYMBOLS OF HISTORICAL AND CULTURAL HERITAGE

Abstract: In this article, the process of covering the brand of cultural tourism of Uzbekistan in the press, publishing houses and tourist TV channels was analyzed. The forms of promoting the brand of Uzbekistan abroad based on the symbolism of objects of historical and cultural heritage are also substantiated.

Key words: tourist TV channels, cultural tourism brand, objects of historical and cultural heritage, publishing, promotion.

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Introduction

An important requirement of the day is to include cultural monuments of important historical value, to provide tourists with access to these opportunities, to act as a link in the acquaintance with the rich historical and historical heritage of the present, to provide more information about cultural monuments and museums. An important part of the interpretation is to consider the information (in several foreign languages), including proposals for determining destinations of cultural significance, their cultural characteristics, specific places and types of tourists. At present, it is not difficult to obtain such information. Anyone who wants to travel can quickly connect via the internet and get instantly acquainted with the cultural riches and conditions of the country they are visiting.

Analysis and results.

Interpretation of interesting museums and historical and cultural heritage sites on the basis of mass media, that is, interpretation - means the transfer of information about the destination and cultural heritage in a formed state. However, it does not contain factual information in detail, but provides information worthy of attracting tourists, highlighting important aspects of popular or as yet undiscovered sites to be visited. From 2019, the Ministry of Tourism and Sports of Uzbekistan will study in detail the coverage of the news in the foreign media through the telegram channel of tourism news (https://t.me/uzbektourismofficial) and its official website(1).

In one of the most popular British publications, The Times, journalist Richard Mellor said, "Travel across Uzbekistan on the short route of the Great Silk Road!" published an article entitled(2).

The article describes the location of the Great Silk Road, which plays an important role in the development of world civilization - Uzbekistan's rich cultural heritage, history, unique past, the author's visit to Tashkent, Samarkand and Bukhara notes that it has instead.

According to him, Uzbekistan has introduced a visa-free regime for 45 countries, including the United Kingdom. This ancient Great Silk Road, which connects East and West, is still of great importance, and the most ancient cities of Uzbekistan are located in its center.

Clarivate
Analytics indexed

Uzbekistan has high tourism potential and opportunities. Special attention is paid to tourism; the created conditions will contribute to the further development of this sector in the country.

- Uzbekistan, Samarkand, Bukhara are mentioned, first of all, the ancient Great Silk Road. During my visit to these regions, I was once again convinced of the hospitality of the Uzbek people. That is why we have a lot of people who are eager to come to this country. But until then, many were hesitant to travel because of visa regulations. The fact that the British are now allowed to stay in Uzbekistan without a visa for up to a month will increase the flow of tourists. I am a short journey through the cities of the Great Silk Road left unforgettable impressions for. Especially during the visit to Uzbekistan, there was a high demand to see the cultural and historical sites included in the UNESCO World Heritage List(3). In the solution of the images of this article, the view of the historical center of Bukhara is given in harmony with the Kalon Tower.

In this case, one of the leading tourism channels in Germany and the European Union, SONNENKLAR.TV, has started promoting travel to Uzbekistan. "By the end of 2019, this process is aimed at providing broad and targeted information to audiences in Germany and other European countries, as well as tourism opportunities, historical cities, museums and world-famous tourist centers of the country. SONNENKLAR.TV(4) TV channel It has more than 40 million households and about 41 million online audiences per month." Abdulaziz Akkulov, Acting Chairman of the State Committee for Tourism Development of the Republic of Uzbekistan, and with the support of the Embassy of Uzbekistan in Germany, held a number of agreements on the promotion of Uzbekistan's tourism potential in Germany and other EU countries. On the basis of these efforts, in the first hours of the publication of the material about Uzbekistan, 16 people paid for cultural tourism in our country. On this basis, later, as a result of cooperation between Germany and other EU countries, Uzbekistan was visited by thousands of tourists(5). Significant work has been done in Kashkadarya region of the State Committee for Tourism Development. Materials published in English on Visit Kashkadarya on the official telegram channel of the Committee's regional office are available from Amazon Press Inc. is based on a collection published by the publishing house. Andijan scholar Ranakhon Khudjaeva's English-language book "Tourism: New Reforms in Uzbekistan" contains 31 dinosaur footprints in the Kalai-Sheron gorge in Kashkadarya region and Lake Achinkol in Mirishkor district(6). It should be noted that the book "Tourism: New Reforms in Uzbekistan" is also available for sale on the continents of Amazon(7). The book covers the most popular tourist destinations of Uzbekistan, the role of the State Committee for Tourism Development in the development of the industry and other materials. If we look at the coverage of the Uzbek brand of cultural tourism in the press, publishing and tourism TV channels, then the tourist potential of Uzbek museums will be shown to the world under the heading "Treasures of the Great Silk Road" in the French news program "Journal de 20 heures"(8) on the activities of museums and reserves in Uzbekistan was found from 2020.

The activities of the Samarkand Bukhara and Khiva museum reserves, along with images depicting the uniqueness of the museumed historical and cultural heritage sites, the impressions of foreign tourists, Khiva Interviews with teachers and students of the College of Tourism, as well as the views of investor Alexander Alauddinov are also included in the video.

The report also highlighted the reforms being carried out in the country in recent years in the field of tourism, noting that the liberalized visa regime has led to a sharp increase in the number of tourists visiting Uzbekistan, especially from France, Italy and Germany.

From 2021, journalists led by Bertrand Deveaud, the head of the French TV channel "Chasse et Peche TV", visited Samarkand. The main purpose of the visit is to conduct photography to reveal the tourist potential of Samarkand, as well as to highlight the cultural and historical heritage. The filming will take place at Registan Square, Amir Temur Mausoleum, Shahi Zinda Complex and other attractions, and the video will be broadcast on "Chasse et Peche TV". The implementation of these measures will further promote Samarkand among the French and from France It will increase the flow of tourists to Samarkand. Thus, the interpretation is filled with new information that is focused, interesting, and memorable, and is seen as a source of additional information about cultural riches.

The ancient and eternal Bukhara region has always fascinated guests and many foreign media with its historical charm. In particular, members of the delegation of media representatives, bloggers and photographers of the Russian Federation, who visited Bukhara region in March 2020, visited Uzbekistan for 10 days. A special info tour of museums and historical and cultural heritage sites was also organized for the members of the creative group, who also visited Bukhara. During the visit, the officials of the Department of Tourism Development of the region carried out all the organizational work and created the necessary conditions for guests. In particular, the ascent of the Kalon Minaret, the symbol of Bukhara, the school of miniatures of the master craftsman Davlat Toshev and night trips around the city impressed the artists as a creative manifestation of cultural tourism. Along with the ancient city, the creative team also studied the unique, unique tourist potential and ethnographic features of the districts of

Bukhara region. In particular, they visited the house of Alisher Narzullaev, a master potter from Gijduvan, and made a documentary about ceramics. In particular, the trip of the guests to the tourist center "Bukhara dessert oasis" in Romitan district was full of unforgettable impressions(9). A documentary film was made about the types of services provided at the site, the history of the tourist destination and the wide range of conditions created at it, which preserves the ancient and national styles. The creative team also visited the Shohrud winery in the region, got acquainted with its history and activities, photographed the production of local wines, and explored the possibilities of gastronomic tourism(10).

By 2021, the State Committee for Tourism Development of the Republic of Uzbekistan, in cooperation with the National Association of Electronic Mass Media of Uzbekistan, will start filming shows. In particular, in the framework of this cooperation, BBC News Uzbek service made a three-part documentary-dramatic film "In the Footsteps of Baburi Princesses"(11). To increase the tourist potential of Uzbekistan, a new show "In the footsteps of Babur and the princesses of Babur" was shot, which reflects the unique landscapes, history and values of the ancient and young city of Samarkand(12) . The Shahi Zinda memorial complex, Bibihanim, Khoja Ahrori Vali, Ruhobod mausoleums, Mirzo Ulugbek Observatory, Khoja Daniyar shrine and other monuments of the Samarkand State Joint Historical-Architectural and Art Museum-Reserve were successfully used in the demonstration solution. In making this documentary, new approaches, ideas and interesting conversations with the locals were combined. Interviews with foreign tourists were also given in the film.

Many analysts describe the modern stage of cultural tourism as an "era of historical events." (The International Festivals and Events Association)(13) based on various social networks, feature and documentary films, and media-based acquaintances over the weekend, an average of 222,000 people were expected to visit places related to the realities of cultural heritage. One and a half days a year such events from day 50 to 60 thousand, the number of festivals lasting 2 days is almost five thousand(14).

The modern tourist has a meaningful organization of leisure time, has a high level of entertainment and interactive value, as much as possible live communication with people (high touch), to see the results in practice, to form a potential level for long-term memory, effective use of free time,

information The use of various tools in the organization of the creation of incentives and the correct allocation of time, the revitalization of trips to cultural monuments are important processes. From a technological point of view, event tourism can be considered as a branch of separate types of cultural tourism, which serves as a tool for the development of existing types of tourism in the formation and use of realities in the form of videos. In this regard, the State Committee for Tourism Development of the Republic of Uzbekistan "Mystery Box"(15) Under the agreement with the founder of the company Jacob Schwartz, Bukhara, Samarkand, Khiva and Shakhrisabz historical and cultural heritage sites and museums began to create virtual designs based on 8K-horizontal, about 8000 pixels, digital cinema and computer graphics. It is a follower of the 8K-4, 4 times behind the previous standard in terms of ultra-high resolution. The number of videos recorded in this format is very small, and due to the high cost of filming equipment, only a few countries, such as Morocco, the United States, Japan and Peru, have such videos that fully explore the country's cultural tourism potential. The premiere of the video about Uzbekistan has started on the YouTube channel "Jacob + Katie Schwarz"(16). An agreement has been reached with Mystery Box to broadcast videos about Uzbekistan free of charge in the largest shopping centers of the Persian Gulf, such as Dubai Mall and The Emirates Mall.

Conclusions.

In this regard, at the initiative of the Department of Tourism Development of Khorezm region and at the direct invitation of the Russian TV channel "Pervyy" with representatives of the popular TV channel "Neputevye zametki" during the 5-day filming process, the artists and got acquainted with the museum complex "Ulli Hovli" in Urgench district and other newly established tourist facilities. On the TV show "Neputevye zametki" dedicated to Khorezm(17) the museum objects of the Khiva State Museum-Reserve "Ichan-kala" were discussed in detail. Today, the creative team of the Uzbek TV channel "Worldwide" has launched TV programs "Art Tourism" and "A Thousand and One Treasures". The TV program "Art-tourism" is mainly dedicated to the coverage of human activities in the field of handicrafts and arts. The coverage of the development of tourism in the regions in the program "A Thousand and One Treasures" also plays an important role in the development of the process.

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