$$m\left(\frac{d^2r}{dt^2}\right) = m\left(\frac{V_\varphi^2}{r}\right)\left(1-\frac{\rho_c}{\rho_\phi}\right) - \beta\left(\frac{dr}{dt}+V_r\right)$$

$$m\left(\frac{d^2r}{dt^2}\right) = \beta\left(V_r - \frac{dr}{dt}\right) - m\left(\frac{V_\varphi^2}{r}\right)\left(1-\frac{\rho_c}{\rho_\phi}\right)$$

$$A' = m\left(A^*\right)^2 \frac{\left(1-\frac{\rho_c}{\rho_\phi}\right)}{\beta}$$

$$\frac{d^2r}{dt^2} = 0 \qquad \frac{dr}{dt} + \frac{B^*}{r} = \frac{A'}{r^3}$$

$$V = \frac{dr}{dt} = \frac{A'}{r^3} - \frac{B^*}{r} \qquad \frac{dV}{dr} = -\frac{3A'}{r^4} + \frac{B^*}{r^2}$$

$$\frac{d^2r}{dt^2} = \frac{dV}{dt} = \frac{dV}{dr}\frac{dr}{dt} = V\frac{dV}{dr} = V\left(-\frac{3A'}{r^4} + \frac{B^*}{r^2}\right)$$

$$m\frac{dr}{dt}\left(\frac{B^*}{r^2}-\frac{3A'}{r^4}\right)=\frac{A'\beta}{r^3}-\beta\left(\frac{dr}{dt}+\frac{B^*}{r}\right)$$

$$dt=\frac{mB^*r^2-3A'm+\beta r^4}{\beta r\left(A'-B^*r^2\right)}dr$$

$$t_{cp}=\frac{V_o}{Q_o}$$

$r>dz0$ – уйдут с песками,

$r=dz0$ – 50/50.

$$\frac{3r^*}{A^*}\left[\frac{2\rho_c \nu B^*}{\rho_ф - \rho_c}\right]^{0,5} = K \qquad d_{вх} = 0{,}8 d_в$$

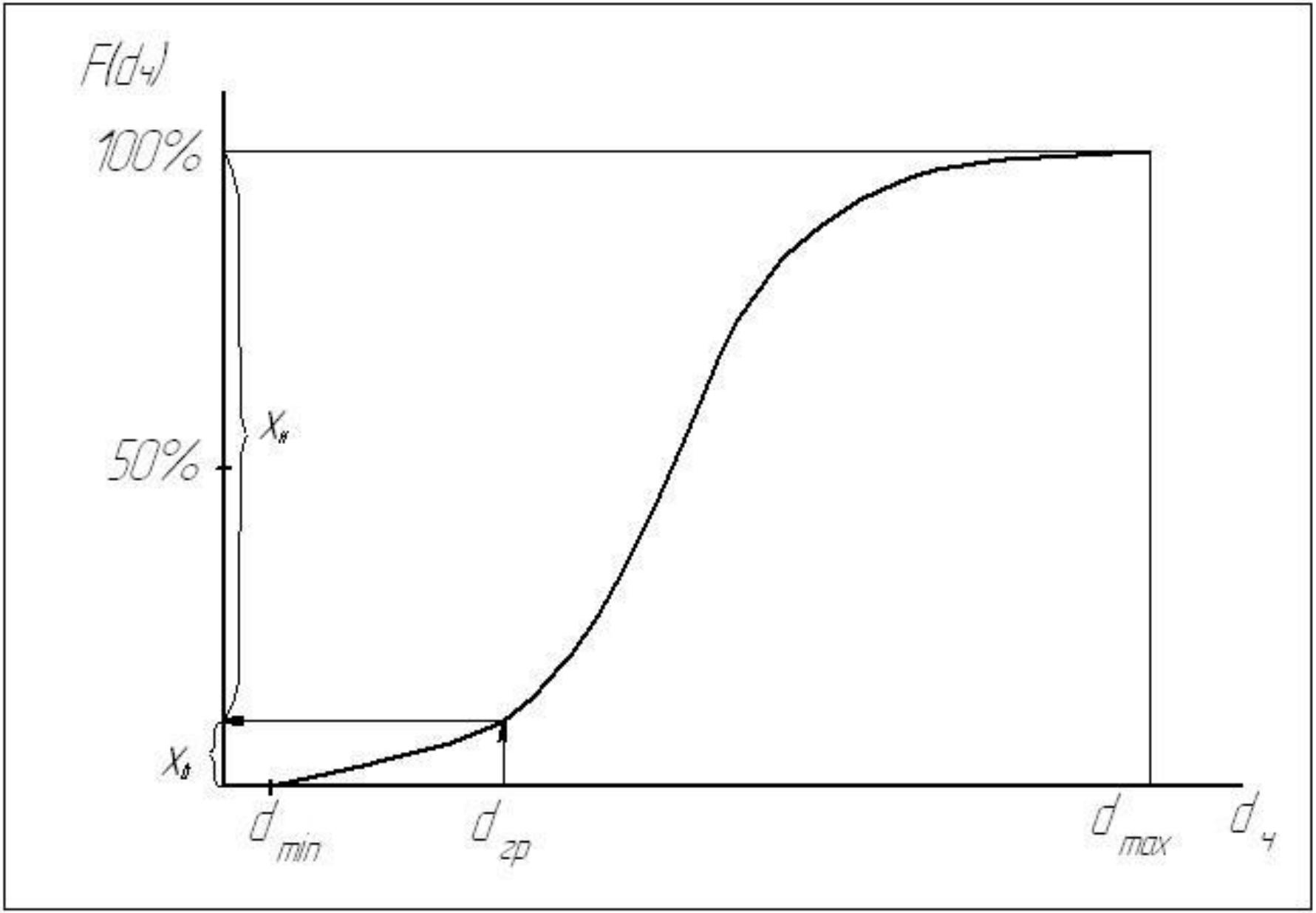
$d_в = 0{,}33D$; $d_{вх} = 0{,}25D$; $L_ц = 1{,}5D$

$$\frac{d_в}{d_н} = 0{,}5 \qquad D = 2{,}6 \frac{d_{\min}^2 V_{вх} \left(tg\alpha\right)^{0,4}}{tg\frac{\alpha}{2}} \frac{\left|\rho_ф - \rho_c\right|}{\mu_c}$$

$$\xi = \frac{2P_{вх}}{\rho V_{вх}^2} = 7{,}5\left(\mathrm{Re}\cdot Fr\right)^{0{,}135}\left(\frac{V_{вх}^3}{\nu_д}\right)\left(\frac{F_{вх}}{D^2}\right)^{0{,}98}\left(\frac{F_{вых}}{D^2}\right)^{-0{,}45}\left(\frac{L}{D}\right)^{-0{,}42}\left(tg\alpha\right)^{0{,}29}$$

$$V_{вх} = \frac{0{,}585 P_{вх}^{0{,}416}\mu_c^{0{,}056}}{\rho_c^{0{,}47}\left(tg\alpha\right)^{0{,}12}}$$

$$D = \frac{4{,}12 d_{\min}^2 P_{вх}^{0{,}415}\left(tg\alpha\right)^{0{,}28}}{tg\frac{\alpha}{2}\rho_c^{0{,}47}\mu^{0{,}95}}\left|\rho_ф - \rho_c\right|$$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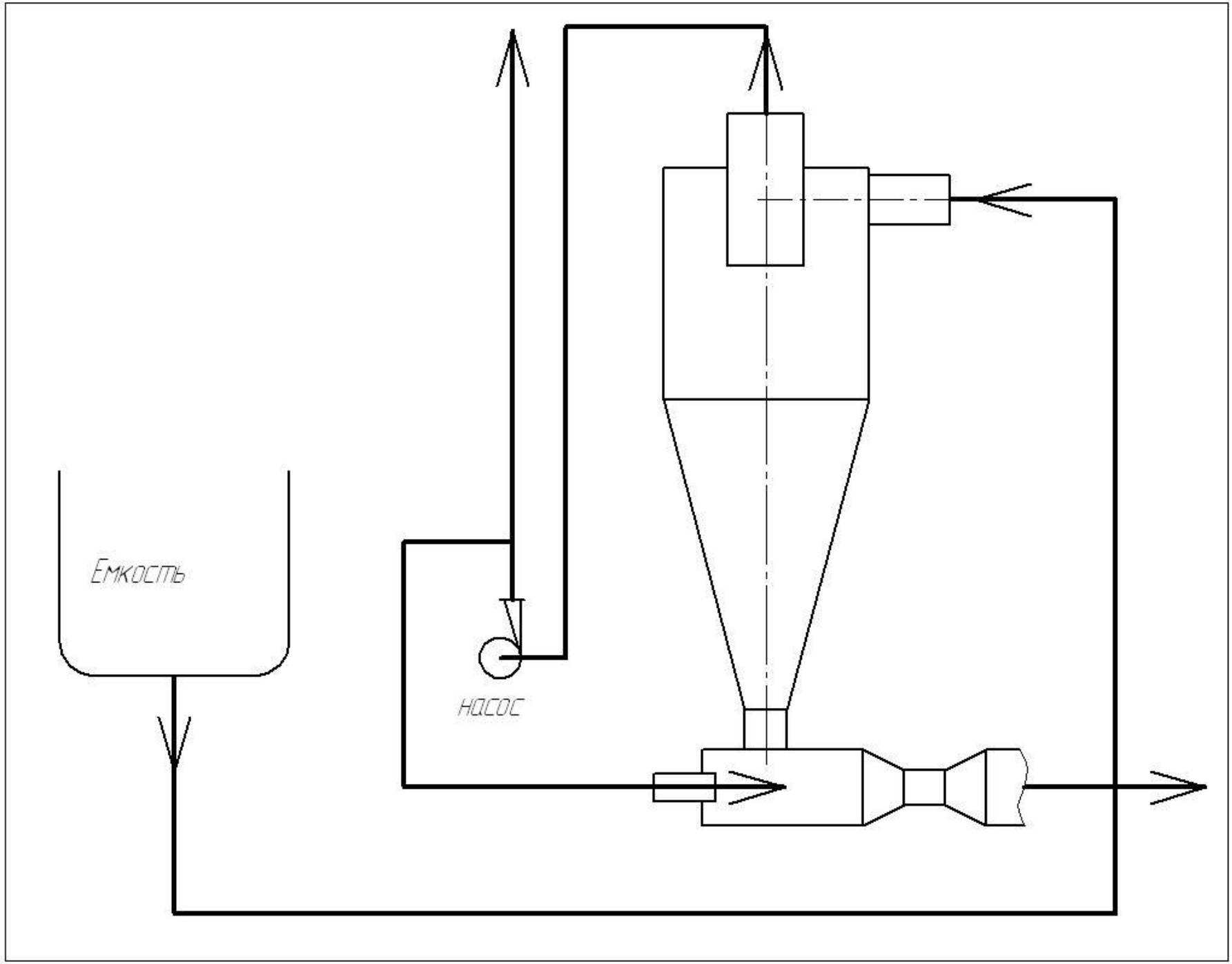
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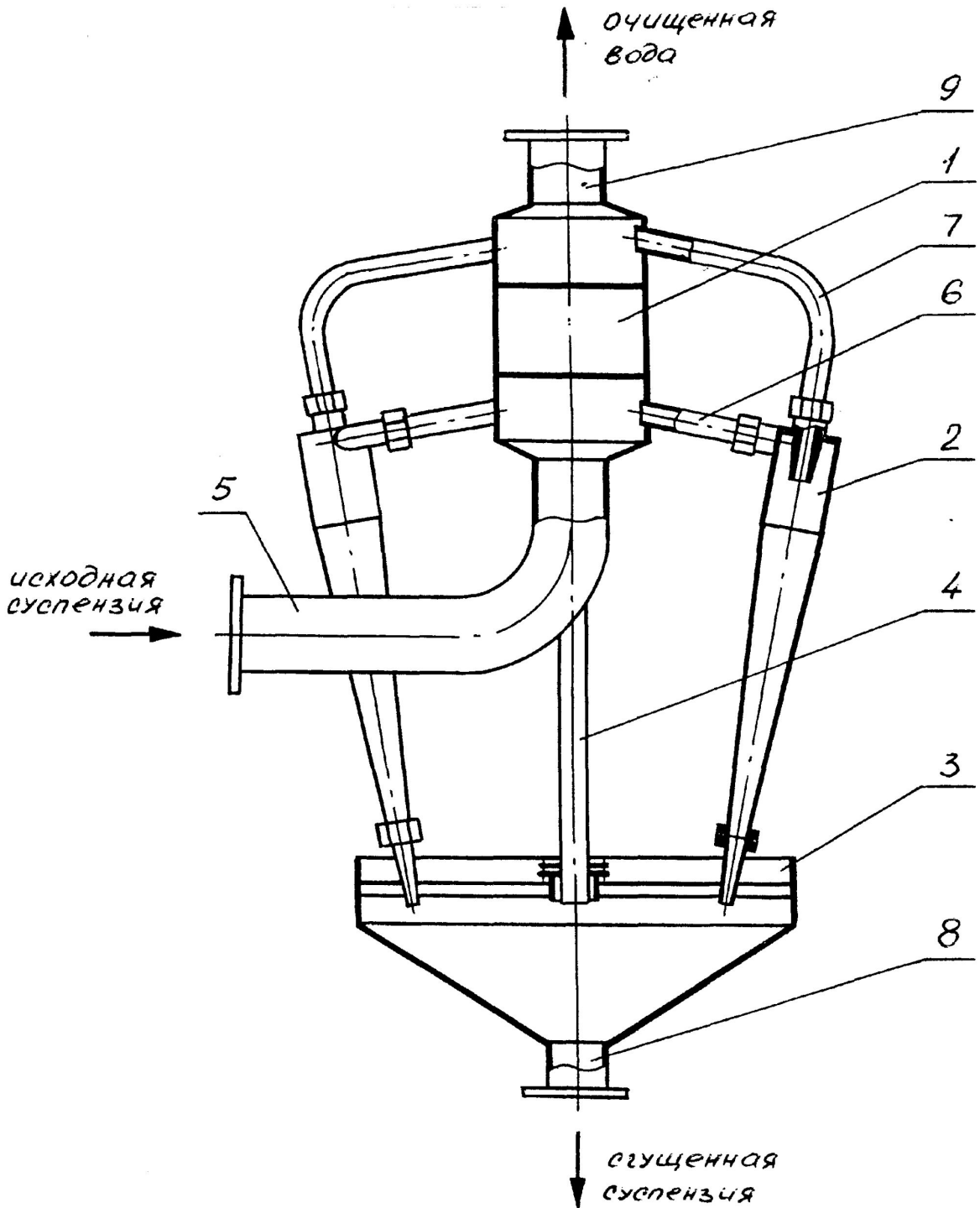
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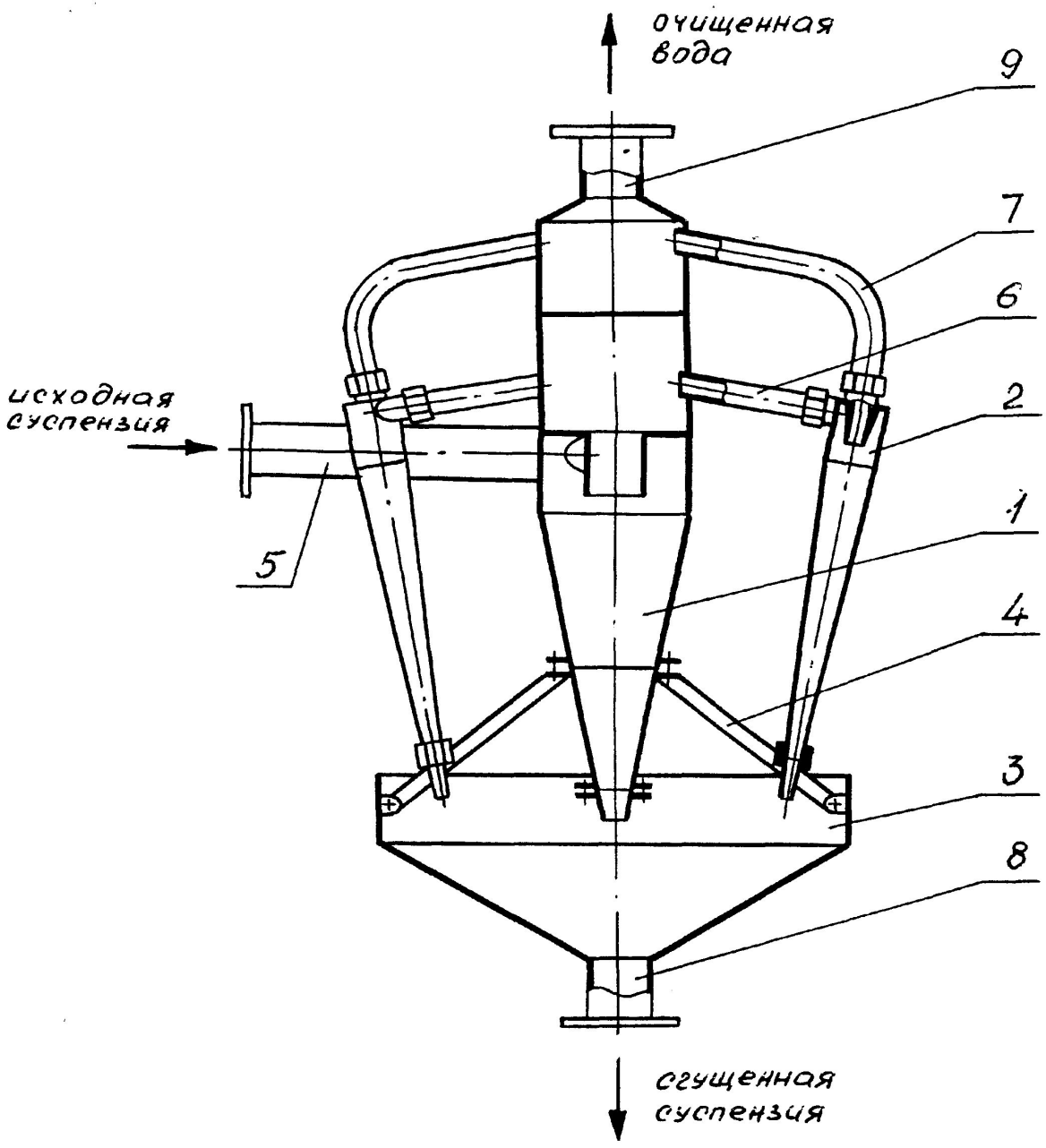
сгущенная суспензия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