[illegible]: $\lambda_1 \dfrac{\partial T_1(R_0,\tau)}{\partial r_1} - \alpha_1 T_1(R_0,\tau) = 0$; (17)

$\lambda_N \dfrac{\partial T_N(R_N,\tau)}{\partial r_N} + \alpha_N T_N(R_N,\tau) = 0$; (18)

[illegible]

$T_k(R_k,\tau) = T_{k+1}(R_k,\tau)$; (19)

$\lambda_k \dfrac{\partial T_k(R_k,\tau)}{\partial r_k} = \lambda_{k+1} \dfrac{\partial T_{k+1}(R_k,\tau)}{\partial r_{k+1}}$ (20)

[illegible]

Список литературы

1. [illegible] / [illegible]. - 2015. - [illegible] 1. - [illegible] 31-38.

2. [illegible] / [illegible]. - 2014. - [illegible] 5. - [illegible] 91-93.

© А.И. Акимов, 2017

УДК 621.914.2

С.П. Андросов

[illegible]

М.А. Федорова

[illegible]

ПЛОЩАДЬ ПОВЕРХНОСТИ ЗУБЬЕВ ОСТРОЗАТОЧЕННЫХ ФРЕЗ

[illegible] [1]. [illegible]

[illegible] [2].

[illegible] 1.

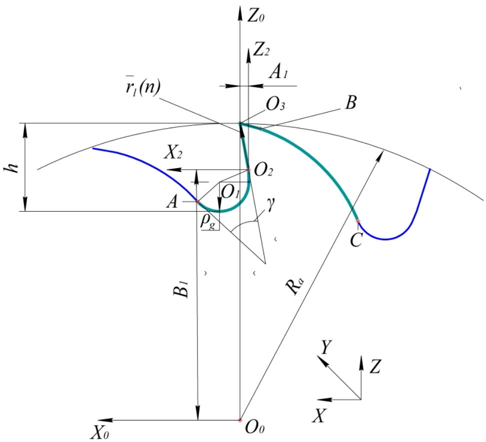

Рис. 1. **Профиль зуба фрезы:**

R_a - [illegible] ρ_g - [illegible] γ - [illegible]; h - [illegible]; AO_2 - [illegible]; O_2O_3 - [illegible]; O_3B - [illegible]; BC - [illegible]. [illegible] A_1 [illegible] B_1 [illegible] O_2 [illegible] $X_0O_0Y_0Z_0$ [illegible]:

$$A_1 = \frac{\rho_g\left(\cos^2(\gamma)-1\right)+\left(h-\rho_g\right)\sin\gamma}{\cos\gamma}; \quad B_1 = R_a - h + \rho_g\left(1+\sin\gamma\right).$$

[illegible] (рис. 2): $O_2AA'O_2'$ - [illegible]; $O_2O_3O_3'O_2'$ - [illegible]; $O_3BB'O_3'$ - [illegible]; $BCC'B$ - [illegible].

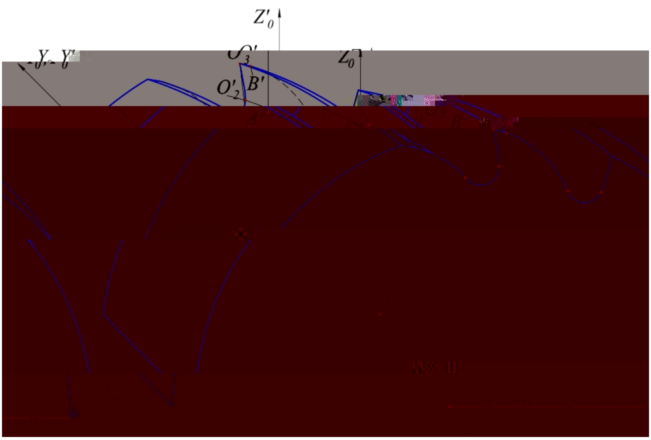

Рис. 2. **Винтовой зуб цилиндрической фрезы**

[illegible] [2]

$$\bar{r}(n)=\begin{bmatrix} -A_1\cos(\varphi)+B_1\sin(\varphi)+l(n)\sin(\gamma+\varphi) \\ p\varphi \\ A_1\sin(\varphi)+B_1\cos(\varphi)+l(n)\cos(\gamma+\varphi) \\ 1 \end{bmatrix}, \qquad (1)$$

[illegible] p - [illegible]; φ - [illegible]; $l(n)$ - [illegible] $\bar{r}_l(n)$, [illegible] O_2O_3 [illegible] $X_2O_2Y_2Z_2$ ([illegible]. 1); n - [illegible].

[illegible] [3]

$$S=\int_0^{\varphi_{\max}}\int_0^{l_{\max}}\sqrt{EG-F}\,d\varphi\,dl\,, \qquad (2)$$

[illegible] $E=\left(\frac{\partial r}{\partial\varphi}\right)^2=\left(\frac{\partial x}{\partial\varphi}\right)^2+\left(\frac{\partial y}{\partial\varphi}\right)^2+\left(\frac{\partial z}{\partial\varphi}\right)^2$;

$$G=\left(\frac{\partial r}{\partial l}\right)^2=\left(\frac{\partial x}{\partial l}\right)^2+\left(\frac{\partial y}{\partial l}\right)^2+\left(\frac{\partial z}{\partial l}\right)^2;$$

$$F=\frac{\partial r}{\partial\varphi}\frac{\partial r}{\partial l}=\frac{\partial x}{\partial\varphi}\frac{\partial x}{\partial l}+\frac{\partial y}{\partial\varphi}\frac{\partial y}{\partial l}+\frac{\partial z}{\partial\varphi}\frac{\partial z}{\partial l}; \quad 0\le\varphi\le\varphi_{\max}; \quad 0\le l\le l_{\max}; \quad l=l(n);$$

$l_{\max}=\left|\bar{r}_l(n)\right|$. [illegible] $\varphi_{\max}$ [illegible]

$$\varphi_{\max}=\frac{L\,2\pi}{P},$$

[illegible] P - [illegible]; L - [illegible].

[illegible] (2) [illegible]:

$$S=-\frac{1}{4}Q\sqrt{C}-\frac{1}{8}Q^2\ln(2)+\frac{1}{8}Q^2\ln\left(Q+2\sqrt{C}\right)+\frac{1}{2}C\ln(2)-\frac{1}{2}C\ln\left(Q+2\sqrt{C}\right)+$$
$$+\frac{1}{4}Q\sqrt{Ql_{\max}+l^2{}_{\max}+C}+\frac{1}{2}l_{\max}\sqrt{Ql_{\max}+l^2{}_{\max}+C}-\frac{1}{8}Q^2\ln\left(\frac{1}{2}Q+l_{\max}+\sqrt{Ql_{\max}+l^2{}_{\max}+C}\right)+ \qquad (3)$$
$$+\frac{1}{2}Q\left(\frac{1}{2}Q+l_{\max}+\sqrt{Ql_{\max}+l^2{}_{\max}+C}\right)\varphi_{\max},$$

[illegible] $C=A_1+B_1+p^2-\left(A_1\cos\gamma+B_1\sin\gamma\right)^2$; $Q=2\left(B_1\cos\gamma-A_1\sin\gamma\right)$.

[illegible], $\gamma=15^\circ$; [illegible] $h=12$ [illegible]; [illegible] $R_a=50$[illegible];

[illegible] $\rho_g = 3{,}5$ [illegible]; [illegible] $\lambda = 40^{\circ}$; [illegible] $L = 70$ [illegible]. [illegible] $S = 802{,}162$ [illegible]².

[illegible]

Список литературы

1. [illegible], 2009. - 405 [illegible].
2. [illegible] // [illegible]. - 2016. [illegible] 30 (72). - [illegible]. 35-39.
3. [illegible], 1980. - 976 [illegible].

УДК 614.8.084

А.Ю. Бавкунова
[illegible]
Ю.Г. Власенко
[illegible]
А.С. Максименко
[illegible]
Д.А. Шевелёва
[illegible]
[illegible]
[illegible]

ФОРМИРОВАНИЕ БЕЗОПАСНОСТИ РАБОЧЕГО МЕСТА ПРОГРАММИСТА

[illegible]

[illegible] 28.12.2013 [illegible] 426-[illegible]3 "[illegible]".