ANNALS OF THE UNIVERSITY OF ORADEA
FASCICLE OF TEXTILES, LEATHERWORK

CONTRIBUTIONS TO THE CALCULATION OF NORM TIME EDGE THINNING OPERATIONS PARTS OF FOOTWEAR

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Abstract: *It is known that regulations allow the introduction in production regimes efficient operation of equipment and methods of rational organization of production. To ensure accuracy imposed regulations must meet the following conditions: to take into account the main factors influencing consumption of work; depending on the types of production which they are intended to ensure adequate precision. In this work the analysis literature authors proposed a new relationship for calculating the standard time for the operation of thinning also set the value of two coefficients K1 and K2. K1 is a constant coefficient for thinning operation of 1,0549; and K2 - a constant that depends on the degree of automation of the machine. Knowing the degree of mechanization machines and time required to perform operation coefficient was determined K2, namely Km – 1,0833; KM – 1,0460; KA – 0,0785. Since the relationship for the calculation of the time aids not it into consideration that a part may contain from 3 to 5 types of profiles, it has been proposed that it be included in the relationship, so there was obtained a new relationship calculation. The study conducted also allowed the optimization of computing time assistant relationship, including the number of adjustments in relation computing machine. Proper use of normative values, taking into account the type of machine, but also their knowledge calclulul methodology allow us to identify the following positive effects on the company's footwear: reducing workload; achieving balanced labor standards; saving human effort; reducing worker fatigue etc.*

Key words: *thinning, time, landmarks, footwear, equipment.*

1. INTRODUCTION

Labor regulations that expresses the size, depending on the factors of influence, shows the need for labor to carry out the various elements of the production process. May be normative: consumption of time, consumption of raw materials, energy etc. Establishing norms is a process times by taking advantage of the lead time before launching the product manufacture. Regulations allow the introduction in production regimes efficient operation of equipment and methods of rational organization of production. To ensure accuracy imposed regulations must meet the following conditions: to take into account the main factors influencing consumption of work; depending on the types of production which they are intended to ensure adequate precision etc. [1].

For the application of labor standards in the production of certain general conditions necessary to ensure their quality. These conditions relate to: the type knowledge production, knowledge of the job (manual, mechanical, automated, robotic, cybernetic), and providing accurate technical and organizational conditions envisaged in developing standard employment etc. Among the factors that

may influence particular elements to change the duration of time we can include: means of labor, working conditions, workplace organization, the movements of the performer, type of production, the level of mechanization of the process. It is known that most often come from the waste of time planning flawed, the mistakes of organization, failure to control, from normative values obsolete or not adapted to the type of machine in the company etc. [1].

2. GENERAL CONSIDERATIONS

By the time norm means the time allotted to a contractor who is suitably qualified to carry out one unit of product, organizational and technical conditions specified in the workplace.

Emission time is calculated with [1-6]:

$$N_t = T_{pî} + T_{op} + T_{dl} + T_{îr} \quad \textbf{(1)}$$

where: $T_{pî}$ is the time of preparation - closing; T_{op} - operative time; T_{dl} - time maintenance of employment; $T_{îr}$ - regulated during interruptions.

Force is the time during which the performer performs or supervises the work needed to transform quantitative and qualitative labor oboiectelor, performing and helpful actions with its components. Operative relationship computing time in s, is next [1-6]:

$$T_{op} = t_b + t_a \quad \textbf{(2)}$$

where: t_b is the time base, the contractor overseeing work performed or for direct labor objects change; t_a - time assistant, the performer runs needed careful handling quantitative and qualitative transformation.

$$t_b = t_{b1} + t_{b2} \quad \textbf{(3)}$$

where: t_{b1} - for curved parts; t_{b2} - for straight sections;

$$t_a = t_{a1} + t_{a2} + t_{a3} + t_{a4} + t_{a5} \quad \textbf{(4)}$$

where: t_{a1} - taking commission from a box and placing it on the machine table; t_{a2} - settlement the part thinned to the right, taking another landmark and its introduction in the car; t_{a3} - stops for changing direction; t_{a4} - adjustment work for another thinning; t_{a5} - gathering thinned parts of the machine table and putting them in a box.

3. PARTICULARS OF TECHNOLOGY THINNING EDGE PARTS FOR FOOTWEAR

Operation of thinning margins parts aims to reduce the thickness of certain areas of contour parts to avoid thickening in areas overlapping edges in assembly parts and assembly parts play an aesthetically pleasing superior [7; 8].

In the footwear industry, after performing the operation mode, we distinguish thinning - mechanical and automated machines made from thinned and hand [7; 10].

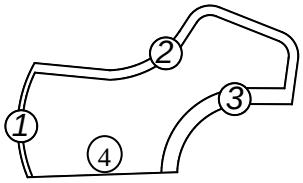
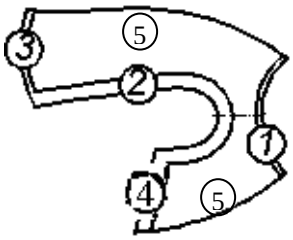
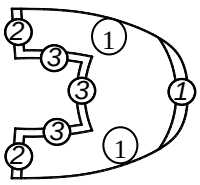
By changing the position of the spacer foot depressor and can get different types of thinning after profile [8]:

- *Thinning right,* should be made to bend the edge and stitch 180º.
- *Thinning slash the size zero* is performed on the parts to be processed for overlapping parts.
- *Thinning oblique finite size* is used to avoid thickening in areas held reserve, but also for parts to be processed by burning.

Table 1 shows the number of adjustments to the machine configuration thinned by parts of

footwear and mechanization machines [7-9].

Table 1: *Analysis of the number of adjustments to the machine thinned*

Graphical presentation of the piese	Type of profile	Name bodies working to be modified	The number of adjustments	
			Clasic machine, M	The automatic machine, A
	1	Spacer, heavy foot (thickness)	+	+
	2	Spacer, heavy foot (thickness)	+	
	3	Spacer, heavy foot (thickness, angle thinning)	+	
	4	Spacer, heavy foot (thickness)	+	
	1	Spacer, heavy foot (thickness, angle thinning)	+	+
	2	Spacer, heavy foot (thickness)	+	
	3	Spacer, heavy foot (thickness)	+	
	4	Spacer, heavy foot (thickness, angle thinning)	+	
	5	Spacer, heavy foot (thickness, angle thinning)	+	
	1	Spacer, heavy foot (thickness, angle thinning)	+	+
	2	Spacer, heavy foot (thickness, angle thinning)	+	
	3	Spacer, heavy foot (thickness)	+	

Analysis configurations of parts of footwear, thinning types used and the degree of mechanization machines enabled the identification of parts thinned the number of flexible adjustment of 3 to 5 per machine mechanics. When the automatic machine requires only adjustment for flexible parts.

4. RELATIONS CALCULATION OF NORM TIME FOR OPERATION THINNING EDGE PARTS

Relationship standard is calculated as the thinning operation is not established, it is calculated proceeding from the standard production / productivity machine, or take the technical documentation developed in the 1980s by Russian specialists. Literature presents normative values for the time and basic auxiliary. The calculation formula No. **4** time helper does not consider that a part can contain from 3 to 5 different profiles. Therefore, it is proposed the following amendment of the relationship:

$$t_a = t_{a1} + t_{a2} + t_{a3} + t_{a4} * n_r + t_{a5} \quad \textbf{(5)}$$

where: n_r - number of adjustments to the machine.

After analyzing the literature, but also the calculations made by the authors propose the following equation for calculating the standard time for the operation analyzed:

$$N_t = K_1 * K_2 * T_{op} \quad \textbf{(6)}$$

where: K1 is a constant for thinning operation of 1,0549; K2 - a constant that depends on the degree of automation of the machine.

We know the following degrees of mechanization: manual (m), mechanical (M), automated (A). Was calculated for each analytical value was thus obtained the following coefficients or Km – 1,0833; KM – 1,0460; KA – 0,0785.

5. CONCLUSIONS

After analyzing the literature has proposed a new relationship for calculating the standard time for thinning operation also was established value of two coefficients K1 and K2. K1 is a constant coefficient for thinning operation of 1,0549; and K2 - a constant that depends on the degree of automation of the machine. Since in relation No. **4** Calculation of Time helper is not it considered that a part can contain from 3 to 5 different profiles, it was proposed that it be included in the relationship, so we obtained a new relationship number **5** calculation.

Proper use of normative values, taking into account the type of machine, but also knowing their calculation methodology allow us to identify the following positive effects on the company's footwear: reducing workload; achieving balanced labor standards; saving human effort; reducing worker fatigue etc.

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