

SUBSTANTIATION OF DIRECTIONS THE IMPROVEMENT OF QUALITY AND DEVELOPMENT RESOURCE-SERVING TECHNOLOGIES IN MANUFACTURE OF GARMENTS

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In the report the questions connected to an opportunity of improvement of quality and decrease the materials consumption of garments due to perfection of technology and means for performance of preparatory-cut production operations are considered. In work the developed model of multipleparameter system of materials preparation to tailoring garments is submitted. The method of aprioristic ranging establishes the importance of the factors influencing ready garments quality. Importance of preparatory operations and means of their performance for maintenance of dimensional clothes quality and used materials rational use is proved. Are described developed devices for technical maintenance of the basic preparatory operations, definitions of parameters providing accuracy and allowing increasing operating ratio of materials.

Increase of competitiveness of let out production is a pledge of any enterprise successful development. The essential role thus is played with high quality of products and their low cost price. By manufacture of clothes in structure of the expenses determining the cost price of production, the share of cost of used materials can achieve 50 - 70 %. In this connection the basic direction of decrease of the garments cost price should be counted development of the resource-serving technological and technical decisions at various stages of a production cycle.

It is possible to take for granted that fact, that quality of performance of materials preparation processes to I shall open renders significant influence both on dimensional quality, and on actual size of the raw material charge on unit of a product and a material losses quantity at production, that is on the cost price of production.

Proceeding from this, the major characteristics of materials preparation system to garments manufacture are:

- A cut quality and duration of a preparatory operations cycle performance;
- A level of technical maintenance of preparatory processes;
- Quality of the received information on an output of organizational - technological objects of materials preparation to manufacture of garments system;
- Industrial expenses for performance of a preparatory operations complex.

In the first and second case it is connected to predicted quality of finished articles, productivity and efficiency of executors work on a preparatory site, and in the third and the fourth - with defi-

nition of quality and materials quantity which have arrived for processing, their rational use, and also financial and material inputs on performance of preparatory cycle operations.

Set of target parameters of materials preparation system to manufacture of garments are entrance characteristics of the following stage of a garments manufacturing production cycle. Therefore from a position of the theory of complex{*difficult*} systems the preparatory operations complex can be characterized, as a component of a production cycle, and in the view of function, as process of disclosing uncertainty about quality and quantity of materials with the purpose of authentic information base formation for its further technological use and acceptance of administrative decisions.

In work the model of multipleparameter system (MC) of materials preparation to garments manufacture the, submitted on figure has been offered.

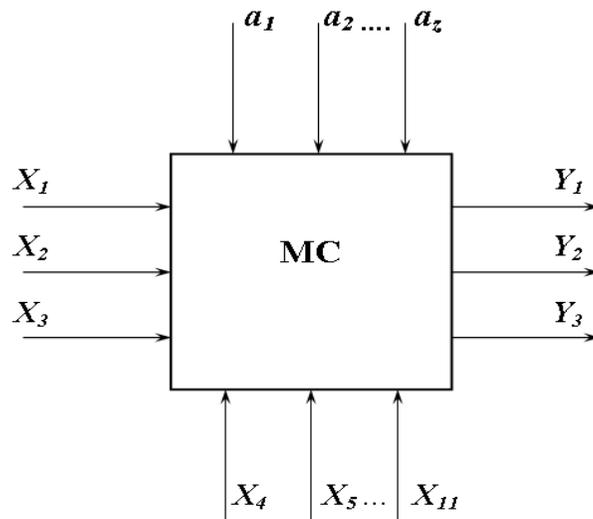


Figure - Model of multipleparameter system of materials preparation to garments manufacture

As entrance factors of multipleparameter system results of performance of stages of design and technological preparation of manufacture, in particular, a choice of materials with set of characteristics $(X_1 = \{x_{1l}\})_{l = \overline{1, m_1}}$, modelling - design features of models of products with set of estimated criteria of quality $(X_2 = \{x_{2\alpha}\})_{\alpha = \overline{1, m_2}}$ and the characteristic of the design documentation $(X_3 = \{x_{3\beta}\})_{\beta = \overline{1, m_3}}$ have been accepted.

To managing factors $(X_4, X_5, \dots, X_{11})$ technical-technological loop variables of garments manufacturing have been referred, in particular, parameters of materials preparation operations and

processes of to I shall open $(X_4 = \{x_{4a}\})$, $a = \overline{1, m_4}$ and receptions of a cut $(X_5 = \{x_{5b}\})$ $b = \overline{1, m_5}$, the list sewing $(X_6 = \{x_{6c}\})$, $c = \overline{1, m_6}$ and finishing operations $(X_7 = \{x_{7d}\})$ $d = \overline{1, m_7}$, the characteristic technical $(X_8 = \{x_{8e}\})$ $e = \overline{1, m_8}$, information $(X_9 = \{x_{9u}\})$, $u = \overline{1, m_9}$ and organizational maintenance of operations $(X_{10} = \{x_{10v}\})$ $v = \overline{1, m_{10}}$, and also factors of a all work cycle quality system $(X_{11} = \{x_{11\lambda}\})$, $\lambda = \overline{1, m_{11}}$.

The set of parameters $A = (a_1, a_2, \dots, a_z)$ represents random factors of influence on quality of the products, determined by a degree of the process equipment work instability, an environment, elements of subjectivity in estimations and administrative actions, etc.

Target parameters of the given system are parameters of an estimation of quality of ready garments to which parameters of appearance $(Y_1 \{y_{1i}\})$ $i = \overline{1, n_1}$, planting on a figure $(Y_2 \{y_{2j}\})$ are referred, $j = \overline{1, n_2}$ and dimensional accuracy $(Y_3 \{y_{3k}\})$ $k = \overline{1, n_3}$. These complex estimations of quality with sets of parameters $\{y_{1i}\}$, $\{y_{2j}\}$ also $\{y_{3k}\}$ are the basic target parameters not only industrial system of materials preparation, but also sewing manufacture as a whole.

With the help of a aprioristic ranging method the importance of various factors for maintenance of finished articles quality has been determined. Thus, the most significant factors, in opinion of experts - specialists of the sewing enterprises, factors which in multipleparameter system of materials preparation to tailoring garments are allocated as entrance parameters are: raw material quality, a choice of a product model and the design documentation conformity to the formulated requirements. However their managing action is possible the persons accepting the decisions, only at a stage of the initial stage of the general preparation of manufacture. That is, if to consider{*examine*} sewing manufacture as multipleparameter system the factors designated as (X_1, X_2, X_3) , are beyond the framework of a work cycle and at direct a stage of garments manufacturing of them it is necessary to exclude from the category of technological process manager.

On the second place on a significance value experts have put a subgroup of technology factors, in particular, set of preparatory-cut production operations and a level of their technical maintenance. Thus, according to results of psychological experiment it has been established, that appear-

ance, planting on a figure and dimensional accuracy of outer clothing appreciably depend on the whole list of the factors referred to technological, technical and a supply with information of preparatory-cut production operations and processes.

However it is important for manufacturers of clothes to know, what informative-technological and characteristics of preparatory operations and cut processes most significantly influence the designated qualitative characteristics, and, in particular, on dimensional accuracy, that in the prime order it is necessary to take into account at the organization of preparatory-cut production (PCP). Thus it is necessary to take into account also and that circumstance that dimensional characteristics of details of a cut correlate with security of required parameters of appearance and products planting of on a figure

Taking into account absence of objective tool methods of an estimation of materials properties influence, and also a level of informative-technological and technical maintenance PCP on dimensional accuracy of finished articles the method of aprioristic factors ranging of had been carried out additional researches on the basis of lines of the Far East and Siberia enterprises and profile establishments. Besides the opinion of experts of profile Vladivostok and Novosibirsk educational institutions has been taken into account.

The analysis of aprioristic ranging results shows, that a dominating role in maintenance of products dimensional conformity to design parameters a material shrinkable properties, quality of confection, accuracy of dimensional characteristics of curves (for not automated cutting).

In the following group of factors, the greatest image influencing dimensional accuracy of ready garments, enter quality of cut operations performance, materials deformation at formation of a cloths flooring, a level of technical maintenance of preparatory production phases. To the least significant such factors as time laying the generated cloths in a flooring and cloths quantity in flooring have been referred.

Taking into account above stated it is possible to approve, that weightiness of PCP factors is experimentally proved at an estimation of their influence on dimensional accuracy of finished articles and the statistical importance of a experts opinions coordination degree which were differing in, as on a technological level of equipment, and volume of manufacture is determined. Expert's opinions coordination factors at their calculation for each separate enterprise were in a range from 0.5 up to 0.7, and the correlation factor value achieves 0.88. It allows to draw a conclusion on sufficient corporationism of sights and opinions of experts on questions of materials preparation system perfection to tailoring garments and increases of finished goods dimensional accuracy.

Generalizing results analytical and experimental researches, it is necessary to note, that the list of industrial - technological and technical factors can be correlated to one parameter of preparatory-cut processes quality - to a parameter of maintenance of required the materials stretch-deformed condition parameters during their processing. This circumstance demands performance of the wide program versatile theoretical and experimental researches. Behaviour of light-deformed materials at their machining demand special researches also because processes of this industrial stage considerably influence characteristics of materials charge rationality.

Thus, at the organization of the sewing manufacture aimed at high commodity quality and resource-serving, it is necessary to take in attention that circumstance, that dimensional accuracy as one of criteria of quality of products, is pawned at a stage of performance of processes and operations of materials preparation system to tailoring the products, representing a base basis of construction of all work cycle.

At the Vladivostok state university of economy and service together with the Novosibirsk institute of technology during lines of years the researches directed on development of new technological and technical decisions, connected to perfection of PCP operations are carried out. The given development allows increasing quality of productions and, as consequence, finished articles quality. During the given period a number of devices for performance of the basic and auxiliary preparatory operations is offered, the majority from which is protected by patents of Russia.

The significant place in these researches is occupied with means for definition of materials linear parameters. It is connected by that the major factors of achievement of normative accuracy of a cut details, design - dimensional parameters of garments and the rational charge of raw material are directly connected to accuracy of measurement of straight-line characteristics of lengthy materials and an objective estimation of basic dimensional errors having a place. It is necessary to note, that by some estimations the general densities of materials losses on length makes more than 18 %, thus the significant part of them depends on size of the trailer rests, discrepancy of cloths measuring, etc.

The analysis of existing means for measurement of length of materials has shown, that significant interest from the point of view of the practical importance and the further prospects of introduction in manufacture is represented with means at which as cloths mover conveyor tape is used, and as the converter of linear movings – optical-electronic system with blocks of dynamic correction of measurement results on a stationary or mobile reference linear measure. Use of conveyor tape as the measured standard should be counted one of the most successful directions of technical perfec-

tion of linear movings converters of who has the further prospect of wide use including in other industries connected to manufacture and processing of lengthy light-deformed materials.

Together with other devices for definition of linear parameters of textile cloths by authors the measuring instrument of the moving lengthy materials length, executed has been developed on the basis of use a conveyor tape carrying function of a reference measured element. A number of the technical decisions used in the given device, has allowed to remove lacks before used systems, including has provided an opportunity to measure materials which surface is sensitive to mechanical influence. Besides such lack of the prototype of a measuring instrument of length, as presence of an error of the measurement caused by changing compression elastic conveyor tape deformation in a zone of measurement owing to interaction with the moving material of changeable thickness, is eliminated by the determined size of the admission, and inconstancy of transfer factor of the linear movings converter following from here.

Basic feature of the developed technical decision is use of a special disk with labels which is placed on the non-moved platen of the moved measured conveyor, established on an input of a moving material. Thus the conducted tape conveyor is executed with console fastening one of the platens, providing an opportunity of its turn concerning an axis of fastening of other platen. Besides the system of registration and correction of results of measurement in addition contains the block of a time delay of a management signal and the microcontroller, and the system of dynamic correction of measurement results is connected to the processor by means of the block of management, the block of a time delay and the microcontroller. This suggested measuring instrument of moving materials length of is supplied with cyclically working system of measurement results dynamic correction which includes a special label, strengthened on an elastic tape of the moved conveyor, and gauge of cycles of turn of a label motionlessly established concerning an elastic tape.

Thus, the suggested length measuring instrument, as well as other developed means, for couples of increase of measurements accuracy, reliability and relative constructive simplicity allows to increase operating ratio of a material at processing finished articles and to provide their dimensional quality.