



STREAMLINE OF PRODUCING KNITTED PRODUCTS FOR CHILDREN

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Abstract: *In this paper are presented two variants of making knitted products, namely by classic knitting and by integral knitting - Wholegarment, a children's hat made of 100% Cashmir yarn. This yarn is chosen due to its superior qualities, which make it so comfortable to wear, offering increased comfort to the wearer. Being a product for children the choice of material is of a high importance. This material is durable, adapts perfectly to any shape and fashion design concept. Another reason is the fineness and softness of the yarn, which can be worn directly on the skin, without the risk of irritation or eczema. Another very important feature is its thermal insulation, and hygroscopicity. The research was carried out in S.C. ASTRICO S.R.L. Piatra Neamt. The products were made on the rectilinear knitting machine SSR 12 SV finesse 7, produced by Shima Seiki from Japan. These knitting machines use the SDS-One graphics station or the APEX graphics station - the latest generation. Using the technological possibilities offered by both the machine and its graphic assisted program, it was intended to achieve the production efficiency, which can be done by finding ways of reducing the execution times as well as increasing the comfort and quality of the items produced.*

Key words: *Knitting, yarn, graphic assisted program.*

1. INTRODUCTION

Considering the impact of contemporary technical and technological progress, the technical basis of production systems undergoes a series of particularly important structural and quality transformations [1, 2]. The technical basis of such production systems will be made up of the most modern machinery and equipment [3, 4]. In knitwear, CAD/CAM applications have been developed by knitting machine producers in collaboration with software companies [5]. With consistent progress in the original technology that anticipates the market needs, Shima Seiki computerized knitting machines have become the global standard [5].

2. EXPERIMENTAL PART

The experimental part was carried out in S.C. ASTRICO S.R.L. Piatra Neamt. For the production of this item the rectilinear knitting machine SSR 12 SV finesse 7 was used, manufactured by Shima Seiki from Japan, fig.1. This machine has a command system and electronic selection with two knitting systems. The machine is fitted with a presser foot and two integrated cam systems. The DSCS device (patented by Shima Seiki) is the most important improvement in knitting technology on the rectilinear machine [5]. The device controls and adjusts the length of the weave yarn digitally,

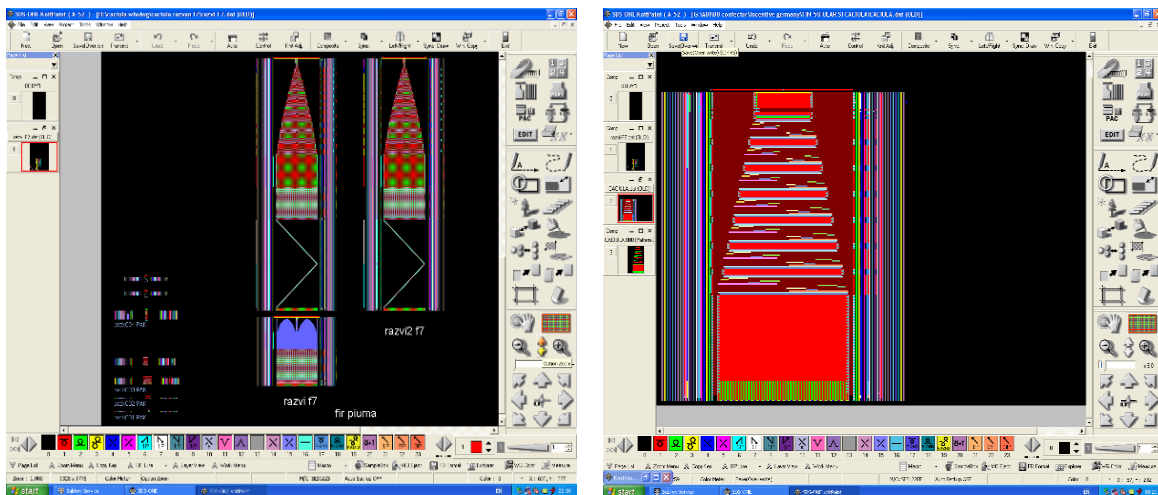
keeping it constant, with a tolerance of $\pm 2\%$. This device is essential for contour knitting and integral knitting as it allows for constantly keeping the knit dimensions [6].



Fig. 1: Knitting machine SSR 12 SV finesse 7

Shima Seiki, a Japanese manufacturer of knitting machines, also owns a range of machines for integral knitwear-Wholegarment products [5]. Our research has been done on a classic knitting machine using the technological possibilities offered by both the machine and its graphic assisted program. These knitting machines use the SDS-One graphics station or the APEX graphics station - the latest generation.

Figures 2a and 2b show the programs of the two knitted products, the children's hat.



a)
b)
Fig. 2: Picture of the product program a) entirely made by knitting
b) made by using the classic knitting method

After making the products design for the items produced, the programs are processed. This means translating the code from the design program into the actual language of the knitting machines in order to produce the items, (Figure 3.).

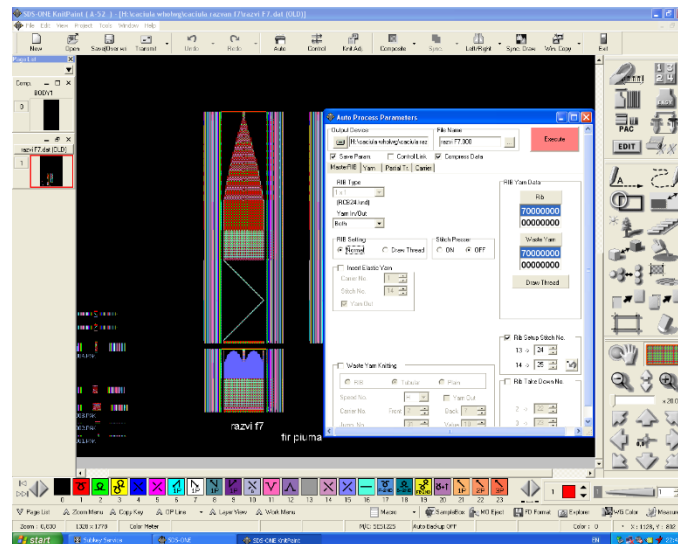


Fig. 3: The phase of program processing of the product obtained by full knitting

Figure 4a shows the knitting time for the product obtained by full knitting and Figure 4b shows the knitting time for the product obtained by the classic knitting method.

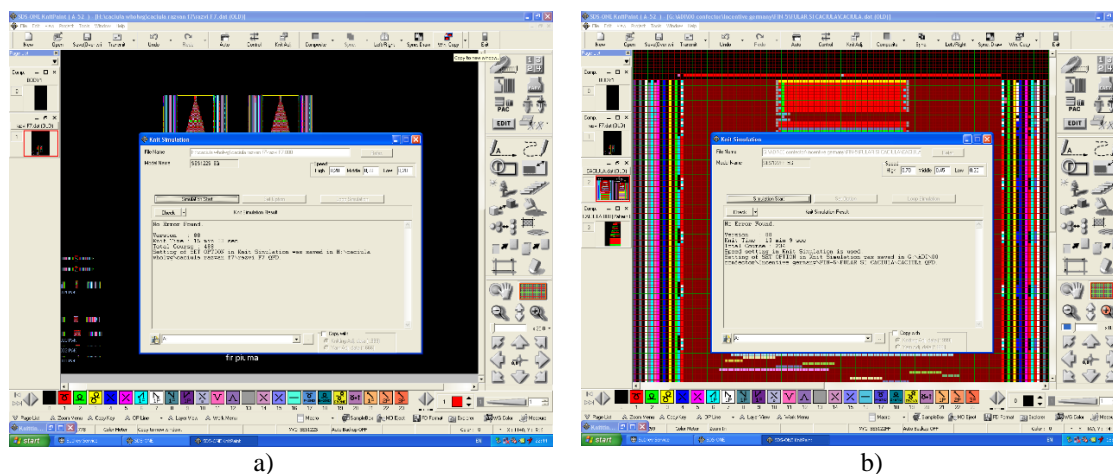


Fig. 4: Knitting time for the product obtained by a) full knitting b) the classic knitting method

By analyzing the knitting times, we can see that the product obtained by complete knitting is done in 15 minutes and 33 seconds, compared to the classic production where the knitting time is 13 minutes and 9 seconds. Although the knitting time in the classic version is lower, overall the product's manufacturing time will be higher due to the time it takes to manufacture the finished product.

The product obtained by classic knitting requires the following phases in the manufacturing process:

- making the chain row - with kett - for finishing the last row of knit;
- making the stitch along the length of the product - with kett - to get a finer effect;
- the finishing operation of the yarns left from knitting and manufacturing.

In the case of the knitted product all the manufacturing times do not exist, leaving only a simple finishing operation (inserting the starting and ending yarns).



a)
b)
Fig. 5: The product obtained by a) full knitting b) the classic knitting method

5. CONCLUSIONS

We would like to conclude that for producing certain knitted products, by using the same machine and graphic assisted program, it is possible to improve product efficiency by eliminating some manufacturing steps produced by the human factor.

With the help of the technology offered by the knitting machine and its support program, the children's hat is obtained by knitting on the rectilinear knitting machine SSR 12 SV finesse 7. Apart from eliminating the intrusion of the human factor in its production, There is also an increase in the aesthetic value, by removing the stitch on the length of the finished product, which increases the comfort while wearing it.

For a knitwear company constantly developing it is of great importance to find ways to reduce the execution time but also to increase the comfort and quality of the products made.

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