

A research regarding the improvement of some operations that cause defects related to the suit production

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In today's competitive business environment companies are forced to make a difference with respect to their competitors, to bring the quality phenomenon forward based on customer satisfaction and to provide taking part of the quality control applications on all production processes of the product. On looking at suit production, it is seen that it is necessary to have professional production process and supervision. A classical men's suit has more than 200 processes on the production line until it gets final shape. In consideration of involving labor intensive work and current production techniques, many and various manufacturing defects are developed. Work definitions are defined by analyzing the production processes and some suitable improvements are recommended in order to prevent defects by the review of the results obtained in the company selected for this study.

Key words: clothing sector, suit production, quality control, manufacturing defect, improvement studies

1. Introduction

Ready-made clothing as the part of apparel involves all the wearing material sold in serial production according to the measurement of the buyer by considering average measurements found by using statistical data. Turkey is one of the leading countries of the world in apparel sector and ready-made clothing. In order to sustain competitive advantage of this sector having an important place in world market, it is necessary to follow the changes and developments, to reveal the problems that the sector holds and to create effective solutions.

In the nineteenth century, men's suit as one of the important wear for the high social class men had been per-

vaded quickly among the white collar workers later and it had become a standard wear at workplaces all over the world in the 1930s [1]. Sometimes, a vest worn under the jacket maybe added to this wear group consisting of trouser and jacket. Suit production passes through process flow at many points until it takes its final shape and it contains a different press line for the final form. Thus, extensive technical knowledge is required for auditing the production. Suit production is high value-added product and also has very complex production process. Any defects that might occur at any point within the production process may cause basis for later defects and it may cause irreversible errors which is irreparable. For this

reason, production flow should be determined in the best manner and it is necessary to prevent the probable defects before it happens.

The aim of this study is to develop solution offers for determining the most common defects with the highest frequency during the suit production process and for preventing the recurrence. In this study the most repeated defects based on data and observation results have found during five-month period from November 2012 to March 2013. It is tried to be produced solution to these common defects in production.

2. Previous studies

In the literature, there are extensive studies on this topic. Yücel (1991)

has studied the flow sheet in the production of pant and jacket forming men's suit and the conditions caused by changes in these flows [2]. Denizler Kayaalp (2004) used Pareto analysis for detection of quality problems and priorities in production, cause and effect diagram for detection of error reasons, and control chart for the detection whether quality at the line is under control statistically in a clothing plant [3]. Tağaç (2006) detected the errors that maybe occur during denim pants production, categorized them according to certain criterion and determined the measures required by various solution proposals after the analysis [4]. Yıldız (2006) compared pants production line with classical sewing machine and pants production line with new machine technology. In this direction, productivity and quality difference between two lines were evaluated [5]. Dal (2009) tried to develop a model proposal oriented to foundation of the quality control system in clothing firm producing classical men's suit. With this aim, mistakes were determined with the help of observation and analysis, some precautions are provided to prevent them and quality control charts were prepared and applied. At the end of these applications, second quality products were decreased and providing the continuity of the product quality was obtained [6]. Doğan (2009) revealed the quality problems according to quality parameters of the production of the denim pants. In this context, an important information sources has been provided for the denim producers [7]. Türkmen and Kırtay (2011) is tried to propose the most accurate quality system for classical men's suit production by determining operations causing defects, loss of time, labor and bottlenecks in the process [8]. Utkun and Öndoğan (2011) studied on the comparison and analysis of the differences observed on the production processes of the jackets designed from leather material and woven fabric [9]. Unal (2013) considered the



Fig.1 Taut arm problem

subject of iron department process of the suit production and evaluation of the working performance [10]. Şener and Kılınc (2013) studied on improvement of production processes by comparison method in three ready-made clothing plant producing women's jacket [11].

3. Material and method

The application field for this study was selected a clothing plant produced men's suit. In this study classical men's suit production process was analyzed in order to create a modern quality system. In the production line and at its end, the observed defects were marked according to its importance degree. Finally these defects already classified were countered and grouped according to the frequency of occurrence. Solution proposals developed for the frequent ones with the highest percent were applied on operations in question, after the review and discussions with plant managers, the studies that bring to a successful conclusion has taken place in this paper.

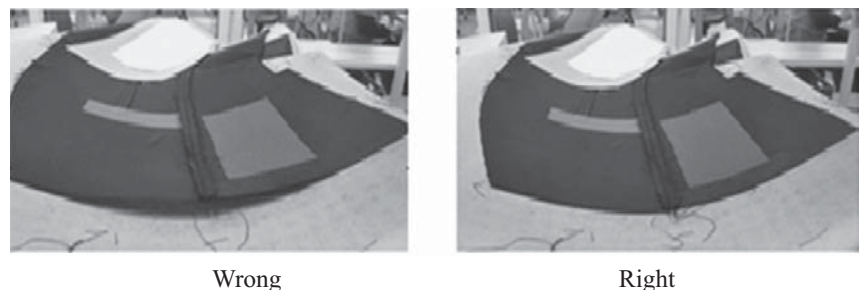


Fig.2 Front body and side cup positioning

4. Findings

It was recorded that during the study more than 5000 unit products were obtained weekly. Errors occurred approximately 5 months period were specified according to the operation, their reasons were examined and the ones having solution proposals have been explained below.

4.1. Errors and recommended Solutions

4.1.1. Tautening problem at the arm

If wadding with proper size and thickness was not used, lining wristband and jacket wristband were discrepant with each other and taut arm problem was experienced. In order not to have taut arm problem wadding with proper size and thickness should be used. The photo of the jacket remedied after eliminating the factors that cause defect is shown in Fig.1.

4.1.2. Press problem

As a result of placing side cup and front body on the form press tightly,

surface may be stretched and after the press it may cause ruffle. In order to remove this error, surface should be placed properly without pulling and pressed not so tightly. Photo related with correction is given in Fig.2.

4.1.3. Recess appearance of the back armhole

Because of the wrong positioning of shoulder and wadding in the back armhole may cause recess appearance. When shoulder is placed from back to the front as shown in Fig.3 above, undesired recess appearance at the back is removed.

4.1.4. Front appearance of satin fabric under collar

Slippage of the satin fabric stitched under collar is an undesired situation. This problem occurs by the reason of slippery surface of satin fabric. Slippage is prevented by adhesion of the interlining tape between satin fabric and collar. An alternative solution is to use felt fabric instead of satin fabric (especially in wool jackets) and stitching with zigzag seam from the sides (Fig.4).

4.1.5. Choppy appearance of lapel

After lining of lapel, excess seam allowance left inside is cut and collar is turned. Cutting process is done very close to the stitching and opening stitch process becomes difficult in ironing. Since the seam allowance is very small, pressman may loosen the sides while opening the stitch unintentionally. This causes choppy appearance at the sides.

For this operation on the lockstitch machine, a knife is added for cutting operation at a distance of 7 mm far from the needle. In other words, using a stitching machine with side cutter provides the allowance left through the stitched surface to be the same. Thus having the same seam allowance left through the side being fixed and uniform makes the work of the pressman easier. The stitched side is pressed without stretch and moreover the need for a separate operator is



Wrong



Right

Fig.3 Wrong and right positioning of wadding to the press

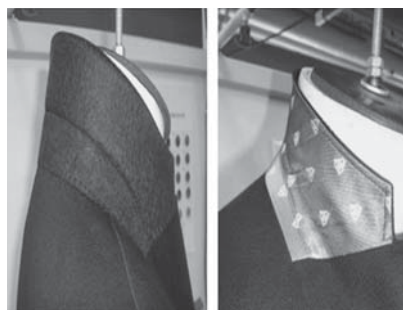


Fig.4 Felt and liner surfaces stitched under collar

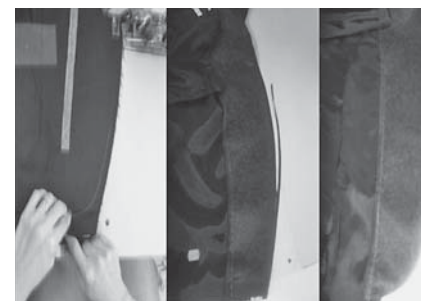


Fig.5 Operation of lining of lapel

also removed, this correction can also seen in Fig.5.

4.1.6. Surface errors caused by wearing of the iron base

Iron base is subjected to wearing caused by impact and friction to inappropriate places during taking or leaving the iron. This results in the wearing or impairment of the surfaces during the ironing.

Preventing the wearing that may occur under the iron base and decreasing the deformation of the fabric surfaces created by this wearing are purposed, as shown in Fig.6 above felt is put where the iron is placed.



Fig.6 Placing felt under the iron base

4.1.7. Turning of pants belt loops at the end of sewing

At the end of stitching, choppy appearance and turning of the belt loops is an undesired situation. This error is more clearly observed with gossamers. In order to remove this turning, belt loops should have more harsh feel. For this reason loops are stabilized with adhesion of the interlining tape. In this context, undesired quality errors such as turning and shrinkage are prevented. Before and after

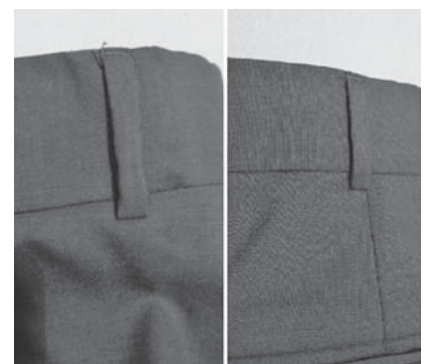


Fig.7 Pants belt loop correction work

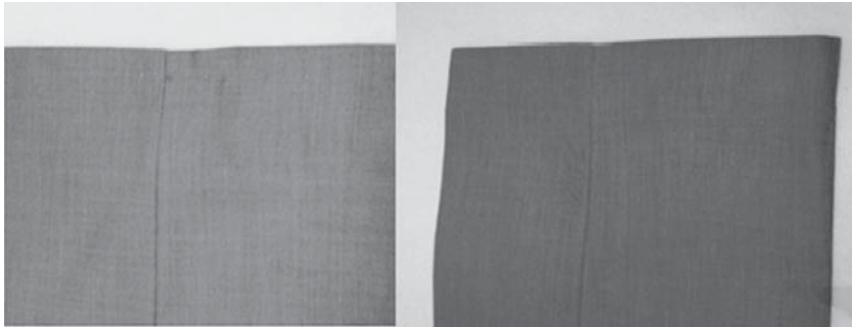


Fig.8 Trouser leg appearance after lapel operation

forms of the correction made in belt loops are shown in Fig.7.

4.1.8. Appearance of sewing mark on trouser leg

For twisting of trouser leg lapel sewing machine is used. With this machine, it is provided that the appearance of the sewing thread does not seem from the outside the fabric. However especially on thin fabric, it is observed that sewing thread appears on the surface of trouser leg and this also makes slight shrinkage appearance on the fabric.

In order to prevent this error seen especially on thin and satin fabrics, adhesion of the interlining tape is done to the region for lapel to be made. In this context as it is seen from the Fig.8. exit of the stitch to the outside is prevented and it is provided that needle take reference from interlining for the submerging distance from the fabric.

5. Conclusion

The study is realized at a ready-made clothing plant having modern stitching machine and automaton park and producing men's suit. The application is done in 5-months process. All defects during this time was recorded by examining all production steps for men's suit in detail. Defect types during production, it's numeric values, from which section it originates have been revealed. Studies were done in order to prevent its occurrence again, make improvement and develop the preventive activities.

In this article, solutions are found by taking into account the defects with the highest frequency from the noticed errors. At the end of solution offers, these mistakes in question were almost not repeated again. Here it is aimed that the studies for improvement would be helpful to all suit producing companies. For this reasons the defects have indicated visually as much as possible.

As shown in this article the expectations in the ready-made clothing is directly related to the desired quality. Especially value-added of products such as suit is very high. Quality of the materials and multi step production process increase the value of the wear highly. For this reason each step of production should be controlled very carefully and intervene any error on time. Correction on the finished product necessitates so much labor and time. Sometimes its repair cannot be possible.

Our country has many well-trained and skilled workers in the field of clothing. It can be produced not only basic knitted wear, but also high value-added products according to the expectation of the customers easily. The aim should be to produce the desired quality in a short and first time by minimizing the error originating from the production.

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