Design and Fabrication of Automatic T-Shirt Folding Machine

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Abstract- *The aim of our project is to "DESIGN AND FABRICATION OF AUTOMATIC T-SHIRT FOLDING MACHINE". T-Shirt Folding Machine is an automatic motor-controlled t-shirt folding machine. The aim of this project is to fold t-shirts merely by pressing a button. The folding machine is fully automatic where one has to place the t-shirt on the folding tray and press the button. It will then fold the t-shirt by itself. This system uses four DC gear motors to control the motion of the folding part. Usually, a person uses conventional method to fold the clothes which by hand folding. Many problems usually faced by working women who is unable to manage time for house hold chores. The purpose of this project is to introduce an easy and fully automatic t-shirt folding machine. This work is a burden for many and sometimes tiring depending on the amount of clothing and number of people in a house. In this propose system, a DC gear motor controls the folding motion and rotates according to a program which uses microcontroller. The microcontroller controls the overall motion of the folding. Result shows that by using this system, the time for folding clothes by human can be reduced to great extent compared to conventional method.*

I. INTRODUCTION

People nowadays have been living with tight schedule in their daily life. Household chorus despite gender discrepancy has been a burden for many. Among the entire chorus that are time and energy consuming is the part where laundries are concern. This work is a burden for many and sometimes tiring depending on the amount of clothing and number of people in a house. Clothes such as shirts, pants and undergarments are the usual and if multiplied by the number of person in a family, will consume a lot of time and energy.

This is a predicament for an average person that needs to be resolved. The process flow of a laundry usually are, washing, drying and folding thus an idea of a machine that can fold clothes are presented in here, among many categories of clothing, the Tshirt is chosen as a test focus and the project is conducted based on the T-shirt folding.

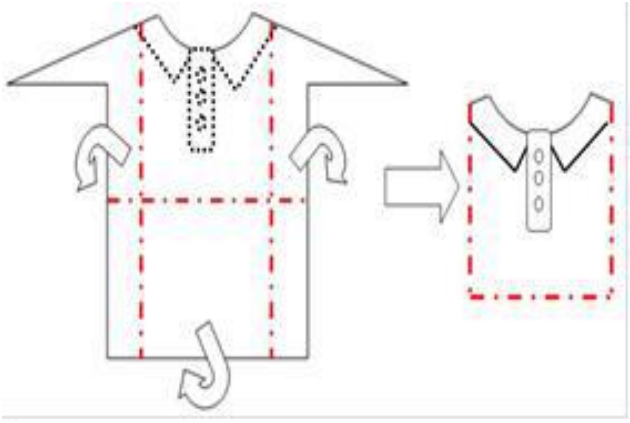


Figure shows the idea on how the t-shirt folding machine will fold the t-shirt; the picture shows the shirt is placed front to back (shows as the dotted line of the collar and buttons). The red dotted lines are the parts where the machine will fold the t-shirt and lastly becoming the one near the right. This idea is presented as an aid for people to speed up the folding process and proceeding with other chorus. This machine intends to aid those with tons of shirts are involved such as in the laundry service, hotels, hospitals and many more places that is associated with ample of clothing.

II. LITERATURE REVIEW

The textile industry in INDIA currently doesn't use the automation in cloth folding.It is very necessary to bring automation according to the literature survey only 89% of manufacturers use any kind of automation in INDIA.The Indian textile and clothing industry currently accounts for about 16 percent of industrial production and about 4 percent of GDP.It employs close to 82 million people, 35 million and 47 million in the textile and allied sectors respectively.

There is very high demand to bring in automation in the cloth folding as well as in the sorting mechanism in the manufacturing industry and also in high maintained mechanically operated laundries.Currently in laundries mechanism used is only limited to cleaning and ironing of cloths and not on the distribution or sorting of the cloth in INDIA.But cloth folding mechanism majorly found in U.S and CHINA.The distribution and sorting of the cloths is a very

time consuming effort and prone to error manually, the automation in this field will save time and error free distribution or sorting of cloth can be achieved.

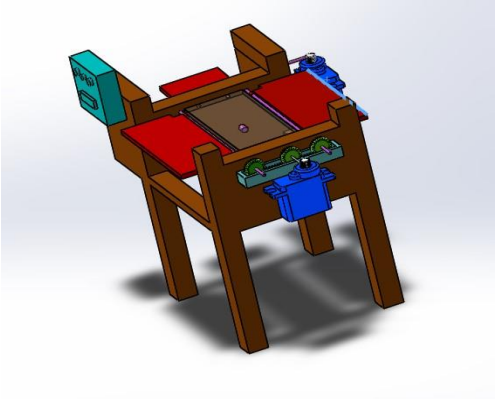
III. WORKING PRINCIPLE

- The system will be divided with two common parts which consists of hardware and software. The software designed in this early level is only for testing purpose. In hardware part, consideration from many aspects is very important in terms of size, electrical characteristic, purpose, and rating of current, voltage and power. After completing these two important parts, and before integrating both of them, several testing must be conducted on each component that used. After confirming the circuit is perfectly functioning, simple program will be burned into the microcontroller. All ports are tested and verified.

- Process of this easy t-shirt folding machine will start once the push button is pressed. When the push button is pressed, motor B will rotate anti-clock wise. Once it reached the time set in the program, it will stop. Then motor B will return to the original position by rotating clockwise. The sequence of the motor will be same for motor A, C and motor D. This process is simplified in Figure below. The folding motion of this machine is controlled by the motor which is attached with the folding material listed as Motor A, B, C and D.

- Motor B is the first motor to rotate where it will make the B flag of the polystyrene to rotate to the left. Then follows by motor A will lift up and make flag A to rotate from left to right. Then followed by motor C from bottom to top to finish up the folding mechanism and finally motor D will move from top to bottom to slide the folded t-shirt on a tray that will stacked the folded t-shirt. This motion continues until the shirts are finish.

IV. DESIGN



V. CONCLUSION

This project work has provided us an excellent opportunity and experience, to use our limited knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work. We feel that the project work is a good solution to bridge the gates between institution and industries.

We are proud that we have completed the work with the limited time successfully. The "**AUTOMATIC T-SHIRT FOLDING MACHINE"** is working with satisfactory conditions. We are able to understand the difficulties in maintaining the tolerances and also quality. We have done to our ability and skill making maximum use of available facilities.

In conclusion remarks of our project work, let us add a few more lines about our impression project work.

Thus we have developed a "**AUTOMATIC T-SHIRT FOLDING MACHINE***"* which helps to know how to achieve smooth moulded pieces with safety arrangement. The operating procedure of this system is very simple, so any person can operate.By using more techniques, they can be modified and developed according to the applications.

REFERENCES

[1] G.B.S. Narang, "**Automobile Engineering**", Khanna Publishers, Delhi, 1991, pp 671.
[2] William H. Crowse, "**Automobile Engineering**".
[3] Donald. L. Anglin, "**Automobile Engineering**".
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