DESIGN AND DEVELOPMENT OF AUTOMATED GLOVE FOLDING MACHINE

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Declaration

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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K. R. S. Premarathne

The above candidate has carried out research for the Masters under my supervision.

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Dr. A. G. B. P. Jayasekara

Abstract

Introducing any kind of automation system to manual process saves substantial time in production enabling reduction of skilled labour requirement, reduction of space, while increasing production capacity. Here automation is applied to fold gloves.

The manufactures of gloves always try to widen their glove market through their innovative products with high quality & high performance. In addition attractive packing system is playing a major role in competitive marketing.

Today, the individual glove pairs packing are mostly done using "Automatic horizontal pillow wrapping machines". Meanwhile there is a requirement to reduce the size of glove packets, as to suit for the "glove vending machines". In that case it is decided to fold a glove pair three times to be smallest in size. This glove folding process is more time & labour consumable.

The objective of this study is to identify and investigate a suitable method to fold gloves while keeping fingers of glove pair without spread fingers during its folding. Available methods which use to fold shirts are not suitable for fold gloves. Folded shirt keeps its shape as it is, but not that in gloves. Those are getting unfold. Hence, need a method for trap the shape.

Three types of conceptual manual prototype models have been tested. Only one type of the conceptual prototype among them has been succeeded. Further improvements and developments have been incorporated to fold the gloves automatically.

The machine consists of two main working stations as "glove folding with poly bag insertion station" and "glove stripping station". It is facilitated with polybag sealer near to the "striping station". This sealer is activated by a photo sensor. Conveyor chain is used to index glove between two stations. It is driven by geared induction motor with a motor driver. Folding mechanism is mainly driven by pneumatic actuators to achieve quick motions.

Maximum output of this machine is 480 pairs per hour while manual folding output is about 140 pairs per hour.

This machine can be further developed into fully automated version by introducing a system for glove placement, a system for poly bag insertion and another system for glove stripping. Hence safety precautions can be improved during placement of gloves to fold.

Dedication

To my beloved

Mother, Mrs. Leela Premarathne

Father, Mr. Piyasiri Premarathne

Wife, Lathika Rathnayake

And

Daughter, Thiseni Dahamsa

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