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“DESIGN THE SCREW CLEANING DRUM & DESIGN & FABRICATION OF ROLLER SORTING & REJECTION MACHINE”

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ABSTRACT

Sorting equipment is used to separate dissimilar items into predetermined groupings as part of an automated process. There are many different types of sorting machines. Selecting sorting equipment requires an analysis of product specifications, features, and applications. Size and speed are especially important considerations. Most automated sorters list the rate in pieces per minute (ppm). In industry main problem is to sort the different size of screw and reject the head less screw, so we research and make changes in some process in the company and design and fabricate the sorting and rejection machine with the help of external and internal guide and also from internet. Main problem in any industry is to sort different size of screw so, In industry we design the screw cleaning drum & design and fabricate the sorting and counting machine which is use for sorting and rejection different size of screw and rivet.

KEYWORDS : *Automation, welding robot, robot arm.*

I. INTRODUCTION

In industry main problem is to sort the different size of screw and reject the head less screw, so we research and make changes in some process in the company and design and fabricate the sorting and rejection machine with the help of external and internal guide and also from internet. Sorting equipment is used to separate dissimilar items into predetermined groupings as part of an automated process. There are many different types of sorting machines. Selecting sorting equipment requires an analysis of product specifications, features, and applications. Size and speed are especially important considerations.

II. METHODOLOGY

On the first step of our project visit we were introduced to the company and then we were taken to shop where different types of fasteners manufacturing machine were working and we saw different types of fasteners. When the screw are made completely after threading the screw are mixed and messed up with oil they are taken in their respected container and taken for the cleaning and removing of the oil. The cleaning drum is a cylindrical rotating drum which works on the principle of rotating drum which separates the oil and fasteners, the screws are mixed on every size accented and manufactured. The cleaning drum rotates and due to centrifugal force the oil gets separated from the fasteners and cleaning is done, but there was one problem they were facing. The screw which were mixed and cleaned together need to be separated and then they required manpower and thus the cost were increased thus we came up with an idea of bifurcating the drum into parts so they need not to be sorted out so we parted it into four parts and partition occurred. Thus their sorting problem was solved with cleaning.

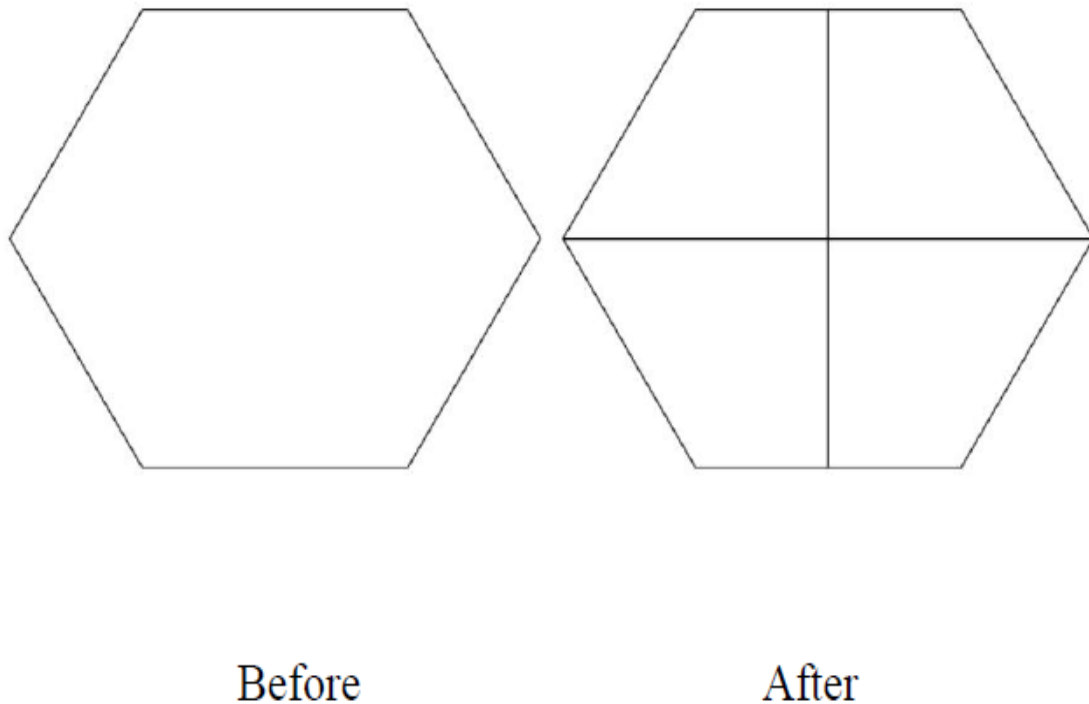


Fig.1 Cleaning Drum

After the process some screws are gone for heat treatment, in heat treatment two or three types of screw get mixed in heat treatment process, again sorting problem occurred in this part, so we design and fabricate the sorting and rejection machine. The design of Roller sorting and rejection machine came from different types of sorting machine and guidance by external and internal guide. Also the basic idea came from Ray's vibrating machine in which the vibratos is used form sorting of screw. So we design the machine Auto cad and passed by external guide In our design we replace vibratory motion in rolling motion so the friction not done in this process and screw not damaged.

The working of our machine and design given below.

Working of the Roller Sorting and Rejection Machine:

First of all the self rotating feeder is set on top of the machine when electricity is supplied to machine The feeder start rotating and screws a dedded in the feeder the screw start coming out of the feeder and different size of screws come out and rest on the roller. The roller is connected with bush and the bush is connected with the gear with help of belt drive the gear is connected to BLDC motor. When the BLDC motor starts the roller starts rotating and the screw start coming forward, the distance between two rollers are adjusted and then three different sizes of Screws fall in different types of collectors. In first collector the head less screws were rejected and after that different size of screw sorted.

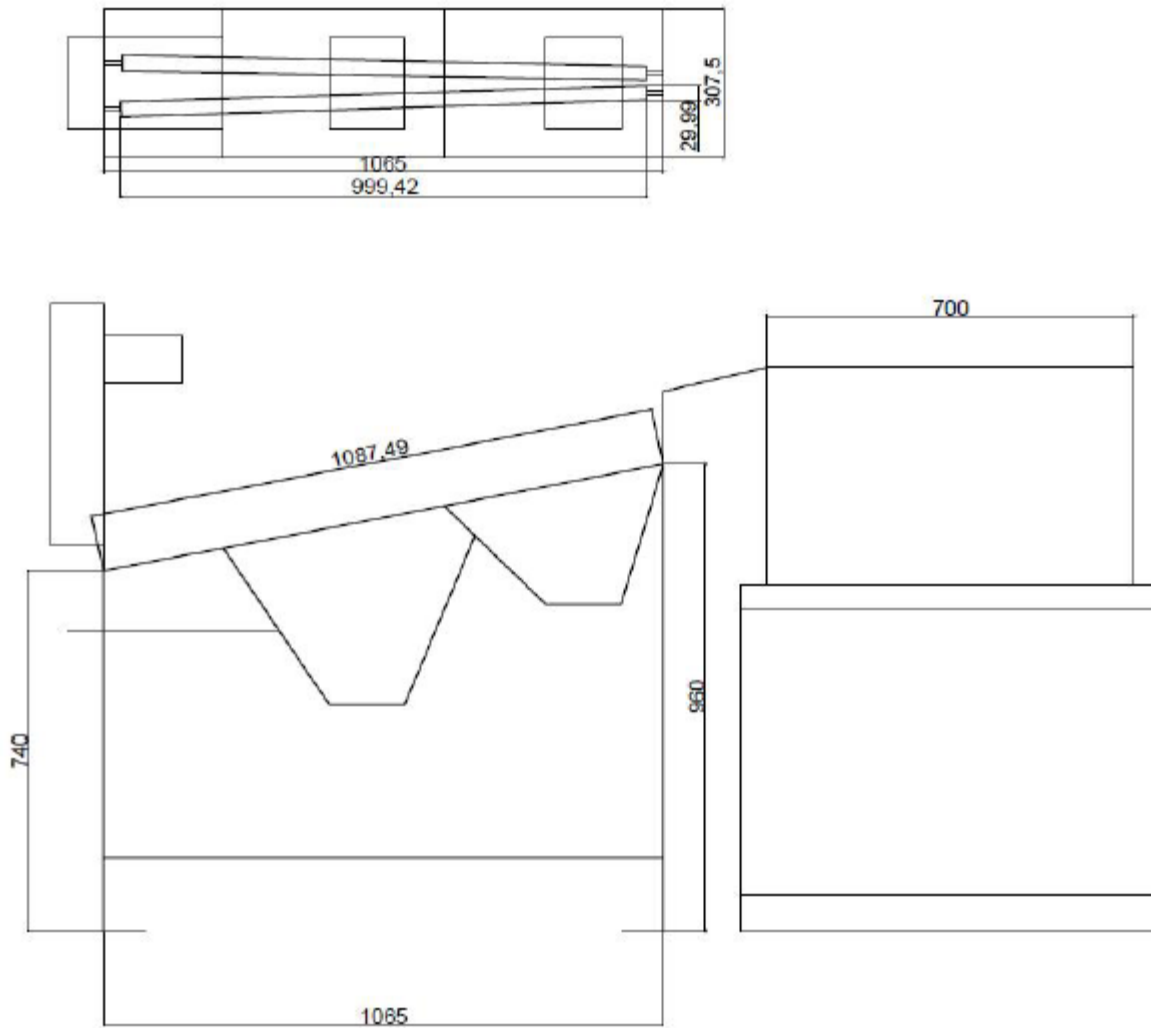


Fig. 2 Roller Sorting & Rejection Machine

III. INDUSTRIAL PROCESS AND PROBLEM STUDY

- First of all the screw making process done.
- The screws made from different types of material as ferrous and non ferrous material wire.
- The screw making process done in Taiwanese fasteners making machine in that machine different size of head screw and different length of screw made.
- After making the screw the threading process is occurred on the screw.
- When the screw are made completely after threading the screw are mixed and messed up with oil they are taken in their respected container and taken for the cleaning and removing of the oil.
- The cleaning drum is a cylindrical rotating drum which works on the principle of rotating drum which separates the oil and fasteners, the screws are mixed on every size accented and manufactured.
- The cleaning drum rotates and due to centrifugal force the oil gets separated from the fasteners and cleaning is done, but there was one problem they were facing. The screw which were mixed and cleaned together need to be separated and then they required manpower and thus the cost were increased thus we came up with an idea of bifurcating the drum into parts so they need not to be sorted out so we parted it into four parts and partition occurred. Thus their sorting problem was solved with cleaning as discussed above part.

- After cleaning process the screw feed in furnace for heat treatment. In heat treatment process two or three types of screw get mixed because of only one furnace is in working condition in company so for time saving different size of screw get mixed and heat treatment process done.
- After this process the sorting and reject the headless screw is big problem so we design and fabricate the sorting and rejection machine.

IV. RESULT

- During the manually sorting the time of sorting is very more, after installing new design of cleaning drum the sorting done automatically and not use manually sorting, this is our first result.
- After installation of new roller sorting machine the rejection of screw is automatically by machine and also sorting different size of screw so at the end of process the result is as time saves and cost saving.

V. CONCLUSION

1. After completion of the project, the following points have come to light:
2. By design of cleaning drum the time saves and also manpower saves.
3. The roller sorting and rejection machine can sort 1kg per minute at medium speed. The speed of motor or feeder can increase or decreased as per requirement of product.
4. The machine can be very useful in the fasteners company.
5. Thus our aim of sorting and rejection of screw is done.

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