

# Automation in manual threading machine

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**Abstract** - The project is associated with AUTOMATION. The threading machine requires lot of man power in sequencing the studs in the threading machine. An automation technique can be introduced before the threading machine to reduce the man power. Automation involves, automatically loading of stud with the help of hopper and vibratory system. Hopper is kept at elevated height and the vibratory system is provided under the hopper to supply stud from hopper. Vibrator vibrates the hopper and studs are arranging one by one from the peak of stud. Stud supply from the hopper is fed to the dies through pipe. Pusher will be placed at the end pipe to feed the stud between dies. Automation in manual threading machine reduces the cycle time, gives continues production, reduces the manpower and variety of studs can be machined.

## INTRODUCTION

Automation is the technique of making an apparatus, or a system operate automatically. We have worked on automation in stud threading machine. The threading machine requires lot of man power in sequencing the studs in the threading machine. An automation technique can be introduced before the threading machine to reduce the man power.

## STUD

Stud is one kind fastener which is used to joint two bodies. It available in varies shape and size. Stud having threads on two sides. Stud provides the ability to obtain much more accurate torque value because the studs don't twist during tightening as do bolt. STUDS are used for engine application for cylinder head installation. STUDS are also used for installation of crank shaft.

Mainly two types of machines are used for threading of studs

- 1) Circular die threading machine
- 2) Flat die threading machine

Flat die threading machine having two reciprocating dies, in which one die is fixed and one die is stationary. These types of dies are capable to form threads on many different types and sizes of studs. Studs are inserted in between this two dies and threads are form on it. Machine on which we have done automation is flat die threading machine.

Existing method:-

Currently the threading of studs is done manual with the help of worker. First of all worker takes raw material of stud without thread and then put it between two dies of flat die threading machine. It will push by pusher mechanism between two dies. Out of this two dies one is stationary and another is reciprocating. The stud is squeeze between them and thread is form on it. Worker requires doing this process repeatedly for form thread on another side. In this method the worker required more power for sequencing of stud because worker requires repeating the process two times for one stud to form the thread on both the side. It also require more time.

Main component for automation process

- Hopper
- Guide pipe
- Pusher mechanism
- Vibrator

## Hopper

Hopper is mechanical device which is used to convey the fastener into machine with desired position with the help of vibration.

Design of hopper: - We have designed the new hopper in such a way that it will be used to convey studs.

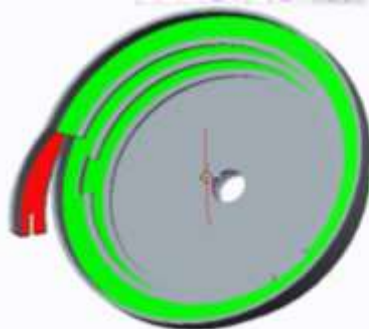


Fig.1 hopper.

For this we have made the following changes.

- 1) Design of ramp

2) Positioning mechanism

**Design of ramp:** - We have designed the ramp in such a way that the studs are conveyed one by one only. On the ramp of hopper we have also introduced unloader points on which if two studs are conveying on ramp at unloader point it will allow only one stud pass on ramp another stud will fall down from it.

**Positioning mechanism:** - Core part of hopper is positioning mechanism. It is placed at end point of hopper. While studs are passing through it due to difference in weight of both side portion of stud the larger side takes position first due to more weight and goes inside guide pipe in series of stud for first machining larger size. One arrangement is provided for position mechanism at the end of hopper in which position mechanism can be changed with help of fasteners. Due to this we can use same hopper for different size of studs only we have to change position mechanism.

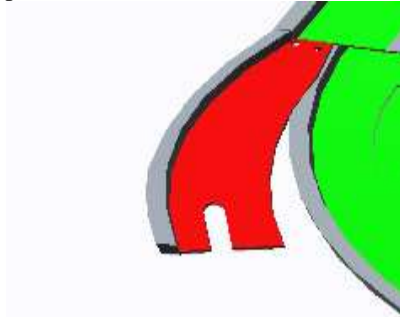


fig.2 position mechanism

**Guide pipe**

In Fastener Company for conveying screw and bolts parallel rails are used. For stud with the help of rail conveying is not possible. Hence we intend to use guide pipe in place of rail.

**Vibrator**

Vibrator is a device on which the hopper is mounted. Due to vibration of vibrator studs are arranged on ramp in sequence manner. Frequency of vibrator is set as per requirement and size of stud.



fig.3 vibrator

- Automation process



fig.4 automation process

The studs are first introduced in the hopper. The studs are conveying forward in the hopper with help of vibration of vibrator.

Hopper will arrange the stud in a single line with specific position.

The studs will now enter in guide pipe.

Guide pipe will guide the studs till the pusher mechanism.

Pusher mechanism will force the studs into the machine one by one in regular interval.

### CONCLUSION

We know from above discussion that in an industry the general manual machine is used. If we will replace the general manual threading machine by automation, so man power will reduce and production rate will improve. Main benefits for production unit is that achieves more numbers of order and also take a continuous production from machines. Also one operator can operate more than one machine at same time.

### REFERENCES

- 1) "Richard B. Ernest, Richb" from us patent no 3414111 Title is "The feed hopper having adjustable article orienting"
- 2) "C. w. CENTER." From us patent no 3474890 about "the feeder mechanism of tyre studs."
- 3) "Warren M. Jackson" from us patent no3926026 is about "the flat die thread rolling machine."

