



FABRICATION OF ROPE MAKING MACHINE

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Article Received on 23/03/2022

Article Revised on 13/04/2022

Article Accepted on 03/05/2022

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ABSTRACT

A wire rope making machine is used for making wires according to utility. The fabrication becomes the most valuable part in making of wire rope making machine as design needs to be use in real making structure. The objective of the fabrication of wire rope making

machine is to develop a heavy structure and make a real life working model. Fabrication needs different types of fabrication tools like cutting, welding, precision instruments, etc. tools for working model to be fabricated. Keywords: Frame work, Spur gears, Bevel gear, Pulley, Motor Drive, V-belt, Eye Bolt, Hook, Bolts and Nuts, Gear Box.

INTRODUCTION

A rope is a group of yarns, plies, fibres, or strands that are twisted or braided together into a larger and stronger form. Ropes have tensile strength and so can be used for dragging and lifting. Rope is thicker and stronger than similarly constructed cord, string, and twine.

Rope may be constructed of any long, stringy, fibrous material, but generally is constructed of certain natural or synthetic fibres. Synthetic fibre ropes are significantly stronger than their natural fibre counterparts, they have a higher tensile strength, they are more resistant to rotting than ropes created from natural fibres, and they can be made to float on water. But synthetic rope also possesses certain disadvantages, including slipperiness, and some can be damaged more easily by UV light.

A rope making machine is used for production of different types of wires such as accelerator

wires, power transmission wires, etc. depending on applications and sizes of machines. In conventional machine, number of gears and space required is more. Also it is robust in construction.

In our modified machine, we use the synchronous AC motor to transmit power to frame, which is attached to the other end of synchronous motor. An epi-cyclic gear system is attached to the frame which provides rotation to the bevel gear system due to which spindle get rotated and winds the rope over it. Due to the rotation of frame wire get twisted. Because of simultaneous operation of twisting and winding of wires, the rope gets produced.

I. LIST OF MATERIALS

Sr. No.	Component	Material	Quantity
1	Frame Work	Mild steel plate	12
2	Spur Gear(Big Gear)	Mild Steel	1
3	Small Gear(Planetary Gear)	Mild Steel	3
4	Gear Box	STD	1
5	Pulley	Brass	2
6	V-Belt	Rubber	1
7	Eye Bolt	Steel	3
8	Bolts and Nuts	Steel	25
9	Motor Drive	STD	1

Dimensions of the Components

Gear Type-Planetary Gear

Big Gear Pitch Circle Diameter=200mm

Small Gear Pitch Circle Diameter=60mm

Module=2 mm

Gear Material Mild Steel

Ultimate Tensile Stress= 440N/mm²

Ultimate Yield Stress= 370N/mm²

Shaft Diameter=20mm

Plate Size= 355mm x 406mm

Stand=355mm x 762mm x 609mm

II. METHODOLOGY

An epi-cyclic gear train consists of two gears mounted so that the centre of one gear revolves around the centre of the other. A carrier connects the centers of the two gears and rotates to carry one gear, called the planet gear, around the other, called the sun gear.

The methodology of fabrication of wire rope making machine includes the cutting, welding and turning process.

The working of fabrication of rope making machine is simple and can be performed by anyone. It does not require any special adeptness to operate. It is simple to operate with the help of planetary gears meshing with main centre gear. Planetary gears are bolted with eyebolt with the help of planetary gear arrangement give rotational motion to the eyebolt and thus the rope followed smooth twisting moment for making proper twisting rope.

IV FUTURE SCOPE

This research facilitates efficient rope making. This proposed work will save time, labor cost. These can be used in small scale industries for efficient production.

The additional features that may be added in this rope making machine is that by increasing the planetary gears we can increase the diameter of the rope as we can increase the no of strand spools. We can use chains instead of belts pulley mechanism.

CONCLUSION

The conclusion came out after studying and fabricating the machine is that the cast iron rods can bear high vibrations obtained during the operation. We have studied and implemented the various process of fabrication like cutting, welding, bending, turning etc.

When the rope making machine is turned on, you can combine the four single strands to the hook provided and control the winding by attaching the initial end of the rope to the spool. In our project epi-cyclic gear will rotate the four single strands spools into a single rope. It has more efficiency and the production rate is higher when compare to the handmade rope production.

REFERENCES

1. DR. Uzma Qureshi, Gagan Pawar, "Design and Analysis of Advanced Rope Making Machine" IJSPR.
2. Dr. A.H. Ingle, "Fabrication of Wire Rope Making Machine", IJRIIE.
3. P. Veera Raju, N.V.S.R.Narasimha Naidu, "Design and Fabrication of Rope Making Machine", IJRAR.
4. Duwi Leksono Edy, "The Effectiveness of Mendong Plaited Rope Production: the Design of Automatic Mendong rope Twisting Machine", MATEC Web of Conferences 204, 05016.