Automation In Coil Winding Machine
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OUTLINE

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ABSTRACTS

In this project " COIL WINDING MACHINE" main objective is to bring out a machine which can implement the idea of automation in Transformer winding or any type of coil windings .

Here in real time application let us consider Transformer Manufacturer and motors where the winding is important criterion.

So, the goal of project is to bring out the model which increase the speed and efficiency of winding.

INTRODUCTION

- Now a days demand of motors is increasing rapidly. Most of motor manufacturing companies use manual coil winding method.

- Manual winding is less accurate and slow

- Our objective is to save time and increase production rate with accurate winding.

- This objective can be fulfilled by automatic coil winding machine.

- This machine can wind coil automatically and also calculate number of turns wound.
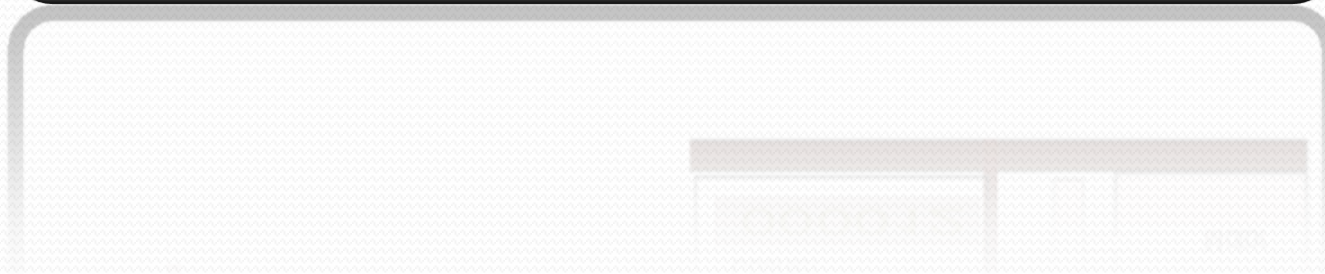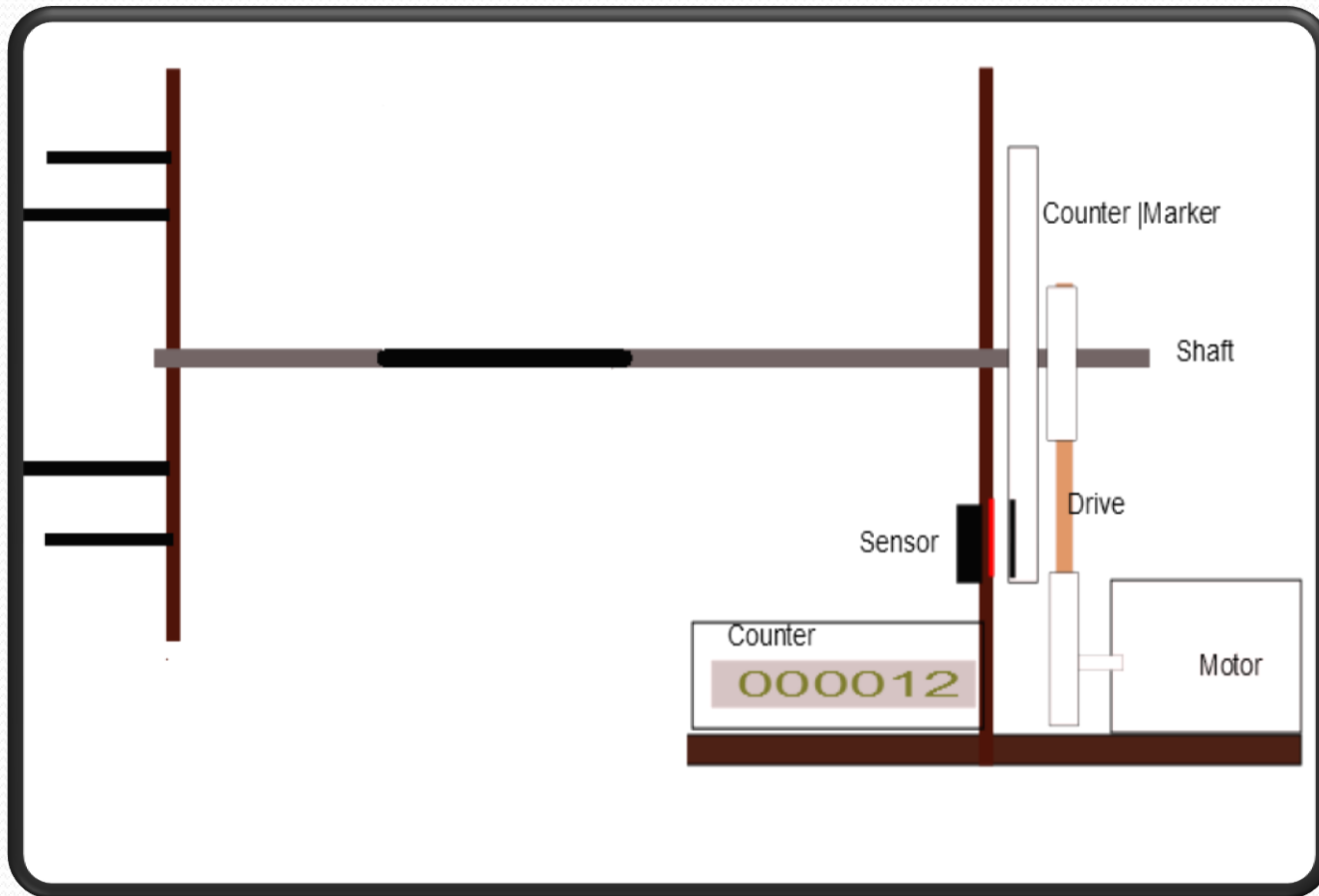
MANUAL COIL WINDING MACHINE

BASIC INTRODUCTION OF COIL
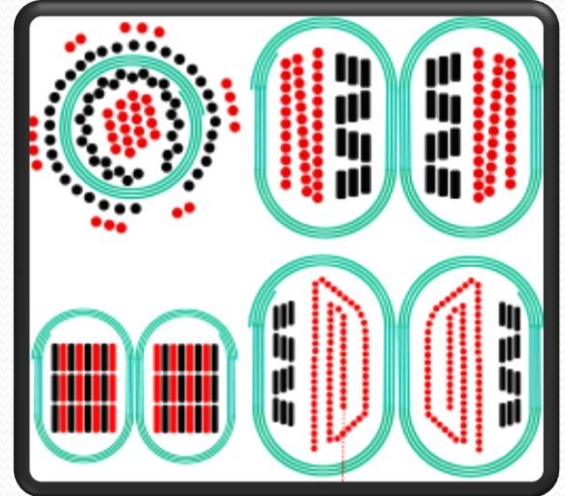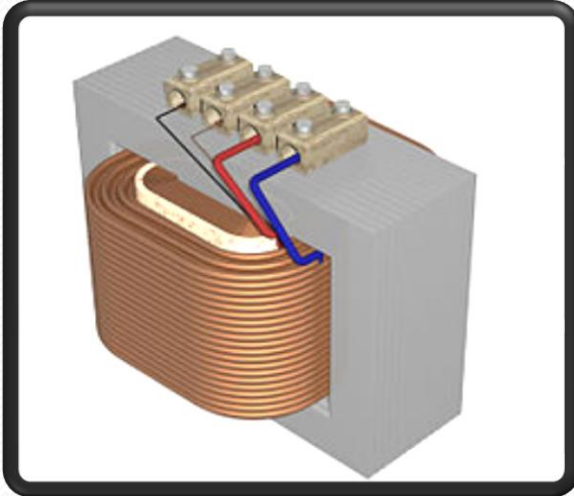
Components required

- DC MOTOR
- BELT DRIVE
- SHAFT
- RPM COUNTER
- SENSOR
- MICROCONTROLER

DC Motor

❖　Function:
DC motor is used as a source of power for operation of machine.

❖　Advantages of DC motors are:
- Speed control over wide range both above and below the rated speed
- High starting torque
- Constant motor shaft torque over a speed range
- Quick starting, stopping, accelerating.

RPM COUNTER

- FUNCTION:
- RPM counter is to calculate number of turns of coil wound.

There are different types of counters:

- Mechanical counter
- Electromechanical counter
- Up/down counter

MicroControler

- Function: It
  It is used to auto stop the machine.

- Microcontroller is a programmable device.

- It is an 8-bit processor, meaning that the CPU can work on only 8 bits of data at a time. Data larger than 8 bits has to be broken into 8-bit pieces to be processed by the CPU.

- We will use microcontroler AT89S52 for automatic coil winding machine

INFRARED PROXIMITY SENSOR

FUNCTION:

- An infrared proximity sensor is a sensor able to detect the presence of nearby object without any physical contact.
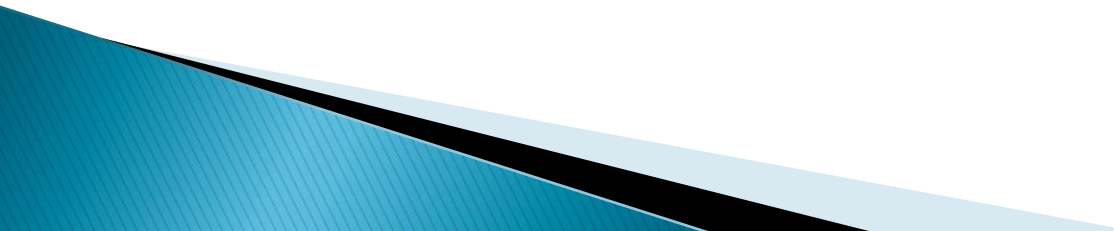
❖Types of Infrared Proximity Sensor:

➢Capacitive photoelectric sensor : suitable for plastic target.

➢Inductive proximity sensor : suitable for metal target.

MARKET POTENTIAL

Motors are widely used for various industrial agricultural and commercial and domestic appliances with the development of power generators, rural electrification, domestic usage etc. the demand for electric motor is growing rapidly, consequently the demand for motor servicing and repair activity which is one of the major repair activity in any motor repair shop, is in great demand, especially in the semi-urban and rural areas.

APPLICATION

- Industrial Relay, Choke coil, Drum core, SMPS, RF coils.
- Voice coils, Timer coils, Solenoid coils, Ballast coils.
- Flasher coils, Pickup coils, Buzzer coils.
- Small Transformer coils

EXPECTED OUTCOMES

- IN MANUAL WINDING A WORKER CAN WIND UPTO 25 MOTORS HAVING 24 SLOTS EACH PER DAY.

- BY AUTOMATIC WINDING MACHINE OUR AIM IS TO INCREASE THESE NUMBERS NEARLY100 MOTORS PER DAY.

ADVANTAGES

• This device works effectively for all type of domestic motors like fan motors (i.e. ceiling, table and cooler), transformers, mixer-grinder etc. It has the facility to restart from the same count where it stopped and it works at a speed of 600 rounds per minute.

• It has an electronic counting meter which has auto stop facility.

• The maintenance cost is very low and the device consumes less electricity i.e., hardly around 70-75 watts and can be operated by inverter also.

• It is shock proof and doesn't create much noise or any waste and therefore can be kept at any corner of a small room.

Comparison

Principles	Automatic winding machine	Manual winding machine
No. of turns	100-350 turns/minute	40-45 turns/minute
Components	Chain drive, motor, microcontroller, sensor, rpm counter required in addition.	No such components required.
Investment cost(rs)	6000	1000
No of motors	Approx 20 motors can be wound per day	Approx 5 motors can be wound per day

Schedule of future working

- Cost analysis

- Graphical representation between manual and automatic winding machine

- Working model

THANK YOU