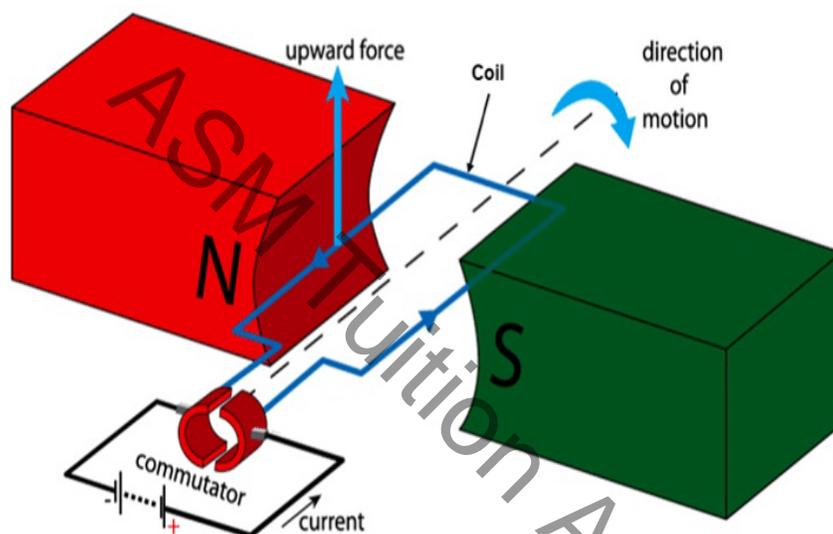


The Electric Motor

Introduction

- When a coil of wire carries an electric current in a magnetic field, it experiences a force that can cause the coil to rotate. This is how electric motors function.
- The diagram shows a simple DC electric motor.



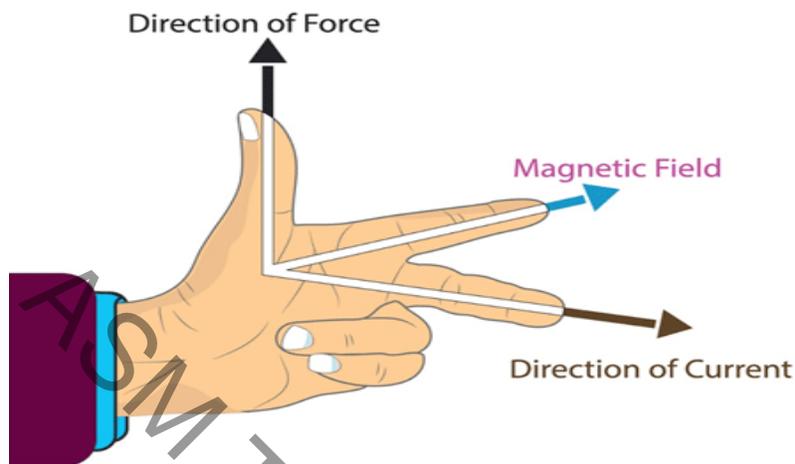
- We use a coil of wire that is free to rotate between two opposite magnetic poles.
- Each end of the coil is connected to a split ring commutator. Each side of the commutator is connected to the opposite poles of a direct current (DC) power supply.

Working of DC Electric Motor

1. The **flowing current** will create a magnetic field around the coil.
2. The **magnetic field** produced by the current will interact with the magnetic field produced by the permanent magnets.
3. In **result, a force** is exerted on the coil.
 - the **direction of the force exerted on the wire depends on the direction of the current flowing through the wire**. The current on one side of the coil flows in the opposite direction to the current on the other side.

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- We can use **Fleming's left-hand rule** to determine the direction of the force exerted on the coil.



4. The magnetic field will produce an **upward force on one side of the coil and a downward force on the other side**. This causes the coil to rotate.

- In the case of above given diagram, the magnetic field exerts an upward force on the left side and a downward force on the right side. This leads to a clockwise rotation of the coil.

5. The coil will continue to rotate until it reaches a **vertical position**.

- At this point, there are upward and downward forces acting on the coil

6. A **split ring commutator** changes the direction of current every 180° , which ensures that the torque continues in the same direction.

- The split ring commutator provides a point of contact between the coils and the external circuit.
- **Carbon brushes**, mounted on either side of the commutator, connect the rotating and stationary parts of the motor. This ensures that the coil does not tangle.

7. Although the different sides of the coil are in opposite locations after a half spin, the reversed current keeps the coil in rotation.

The speed of rotation of the coil can be increased by:

- increasing the size of the current;
- using a stronger magnet;
- increasing the number of turns of wire in the coil;
- reducing friction between the coil and the axel it rotates on.

Application of an Electric Motor

► The electric motor is used widely. It has got many applications. These applications describe the use of an electric motor., Electric motors are an essential part of many instruments. It has many applications. Some of them are:

- a. The electric motor is used in blowers, machine tools, power tools, pumps, and turbines.
- b. It is also used in rotating devices like compressors, rolling mills, fans, ships, movers, etc.



BEAUTY APPARATUS



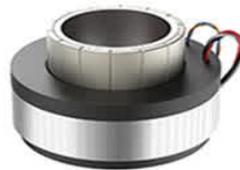
VEHICLES



HOUSEHOLD APPLIANCES



ELECTRIC TOOLS



OFFICE EQUIPMENT



PUMPS AND COMPRESSORS



GARDEN EQUIPMENT



MEDICAL EQUIPMENT

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