Name : Rishabh Sarswa
Rollno : 19UELE8030

Experiment : 9

Object :

To understand the construction and working principle, possible faults, testing methods of electric mixers and grinders.

Apparatus required :

Electric mixer (single phase-AC),
Screw driver,
Test lamp (40 W)

Theory :

Mixer and Grinder is a kitchen appliances that facilitates task related with mixing and crushing the food. These electric machines are very much helpful as they save time and energy. There are number of attachment like blades, disc, jars etc. comes with these appliances to facilitate different uses to make the food more full of flavour and yummy.

Construction

Motor

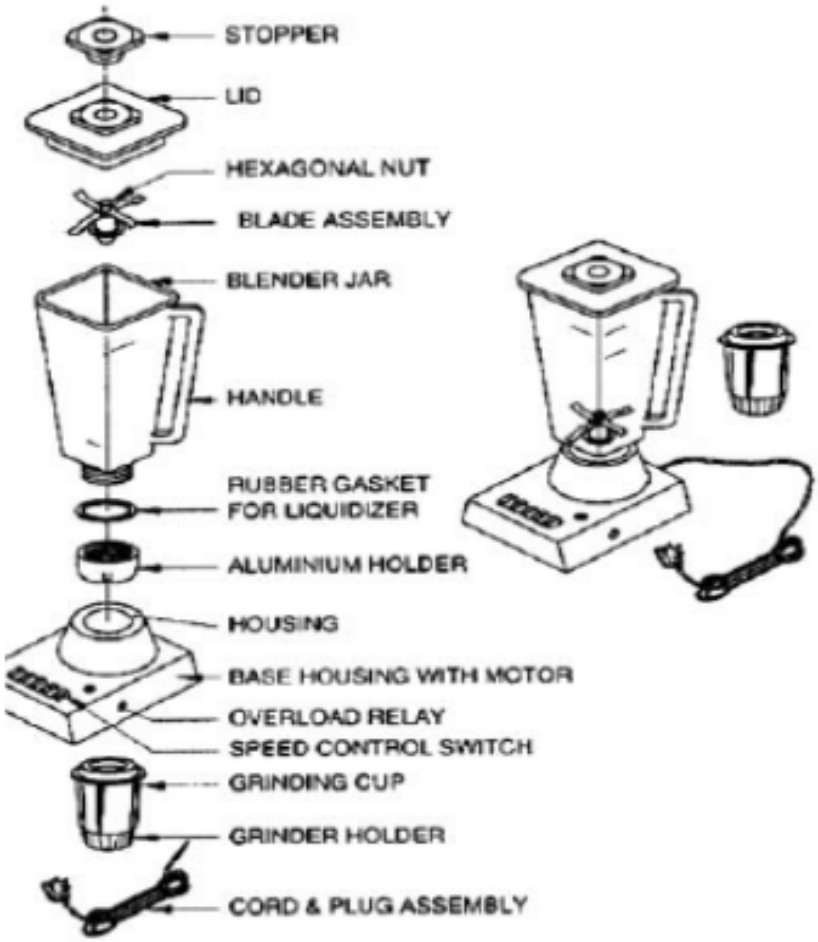
The motor used in mixer is Universal motor, which is nothing but Series motor having both armature and field. The special feature of this motor is that it can be operated both in AC and DC supply. The armature core is made of silicon steel alloy and laminated to avoid eddy current and hysteresis losses. This motor provides a very good torque and its speed is regulated either by tapped field coils or tapped resistance in series. The power rating of motor would be about 500 W, operates on 220/204 V, 50 Hz AC supply. The no load speed would be about 18000 rpm with a full load speed of about 10000 rpm. The motor is housed in base of mixer body.

Blender and Grinder

Normally each mixer is associated with 3 kinds of jar of different capacity.

Blades

Blades are made of good quality stainless steel and will therefore give high life. Each jar will have its own blades according to its purpose. Jars are designed to grind dry or wet substances. So it is advisable not to interchange the blades from one jar to other.

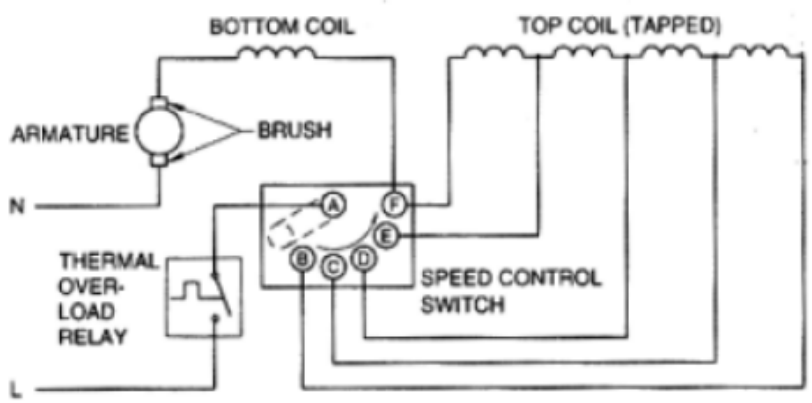


Speed control

For speed control purpose, the tapped field coils are normally employed in mixer motor. The tapped field coils as shown in Fig.11.3, enables speed selection through a rotary switch provided in the mixer. Normally 3 speed levels (1, 2 and 3) will be provided in the mixer motor. By turning rotary switch clockwise, we can get speeds 1, 2 or 3 as desired mixer jars. For inching purpose, it is required to turn rotary switch anti-clockwise for a few seconds and release for momentary operation. (This is especially useful for wet grinding of chutneys, mincing meat, grating vegetables, crushing ice, etc.).

Working:

1) Place the rubber sealing ring on the base of the blade assemble. Screw the blender in the assemble until tight.
2) Place the ingredients in the blender.
3) Place the lid on the blender. When the motor is running, only the centre stopper should be removed to add water for the free circulation of materials.
4) Switch on the motor.
5) If a material sticks to the sides of the Jar, stop the mixer and stir using stirrer. Then run again.
6) When the operation is complete, Switch OFF the mixer. Wait for few seconds till the motor stops completely and then remove the blender.



Precautions :

1) Do not run the motor without any load.
2) The motor should not be run for more than the specified time (prescribed by the manufacturer)
3) Do not operate unless Jar and Dome are in proper position.
4) Do not grind hot ingredients in the mixer.
5) Do not add solid ingredients, when the Motor is running.
6) Do not add big ice pieces while making cold drinks. Crush the ice and put into the blender.

Faults and Remedies :

Sl.No.	Fault	Possible Reason	Remedy
1.	Motor is not running	1. No voltage or Low voltage 2. Either motor field or armature coil may get open circuited.	1. Check the supply voltage with multimeter. 2. Do the continuity test. If there is an open circuit fault, do the service.
2.	Supply voltage is correct. But motor is not running.	Overload in the jar and hence overload protector may get tripped	Press the overload relief button and remove some materials in the jar. Now restart.
3.	Motor rotates at same speed in all speed settings	May be loose connections in the regulator	Check and solder the wires at regulator terminals.
4.	Excessive heat produced	1. May be any short circuit in armature or field coils. 2. There may be wear and tear in the bearings.	1. Do the continuity test. If there is an short circuit fault, do the service. 2. Check and put lubricating oil at bearings. If heat persists, replace it.