Electronic Appliances:

- The instrument that controls electrical signal or electrical energy is known as electronic appliance.

Name of some Electronic Appliances:

- Television
- Microwave oven
- Induction cooker
- Washing Machine
- Dish Washer
- Vacuum Cleaner
- Pain relief laiser
- Treadmill
- Refrezarator

Cooking Appliance

Washing and drying

Health electronic Appliances

Refrigerator and Air conditioner

GREE

Importance of electronic Appliances

- Can operate easily
- Maintenance cost is low
- Works in low power as a result saves electricity.
- Accuracy rate is increasing
- Making our daily work easy

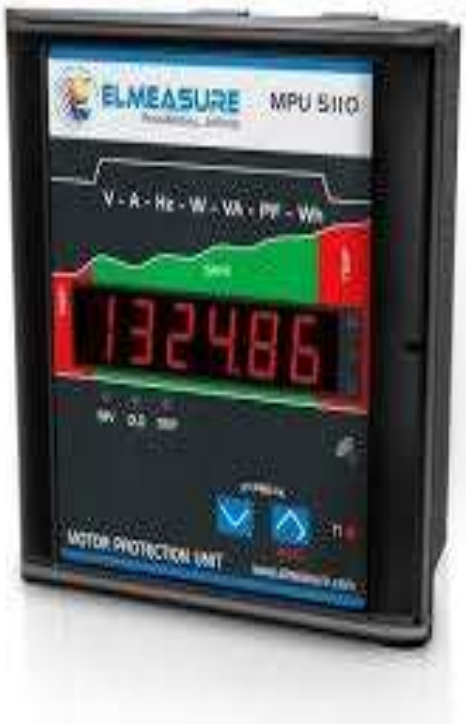
- Do you have any questions??

Different types of Industrial Electronic Appliances

Measuring instrument(Clamp on meter,Speed counting machines)

Monitoring appliances(flow meter,Laser scanner)

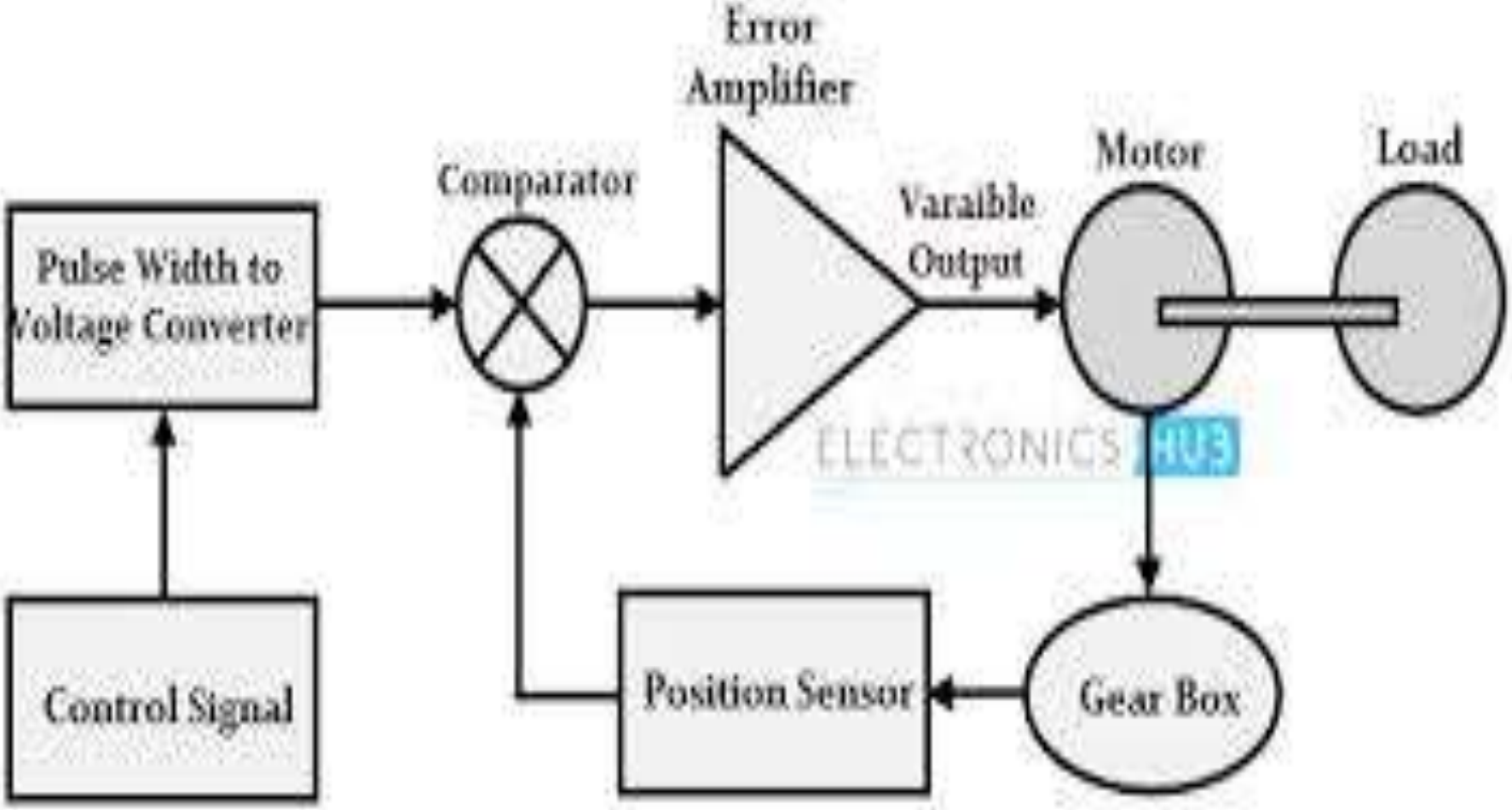
Protective Appliances(motor protection system,leakage current detector)



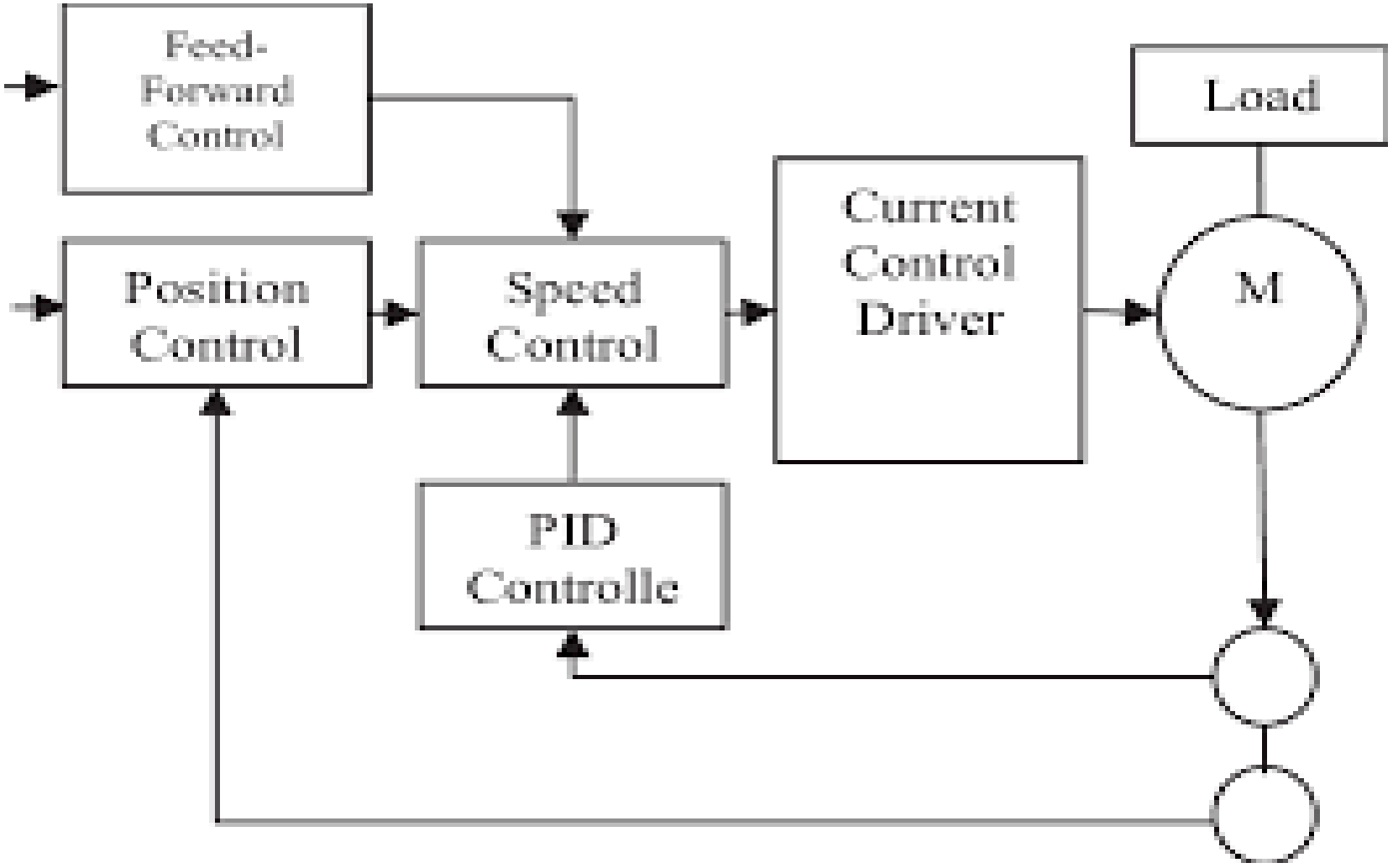
Productive Appliances

Auxilary Appliances(SMPS,inverter)

Dc Servo system

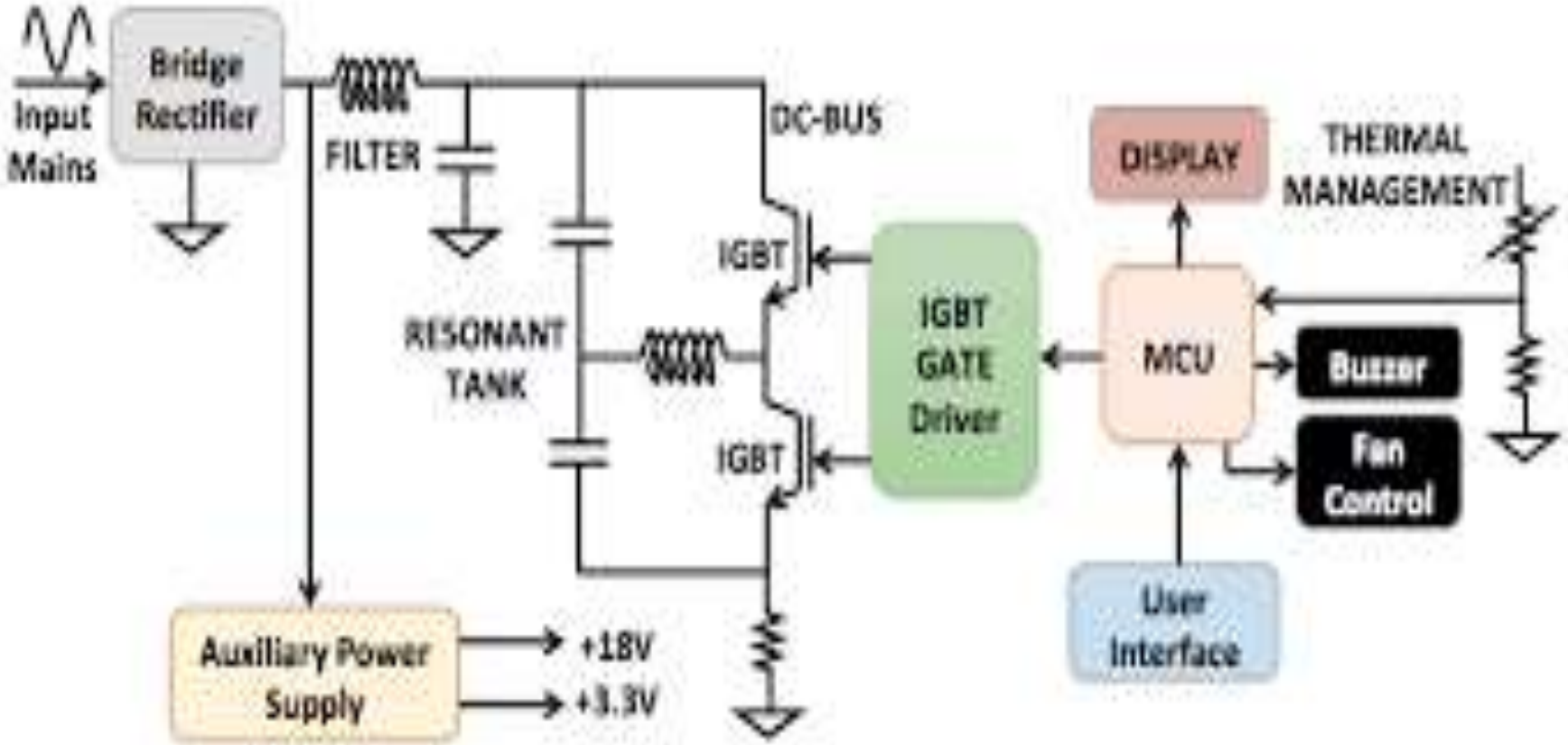


AC Servo system



Induction Cooker

- **Induction cooking** is performed using direct induction heating of cooking vessels, rather than relying on indirect radiation, convention, or thermal conduction. Induction cooking allows high power and very rapid increases in temperature to be achieved, and changes in heat settings are instantaneous.


Input Mains
Bridge Rectifier
FILTER
DC-BUS
IGBT
RESONANT TANK
IGBT
IGBT GATE Driver
MCU
DISPLAY
THERMAL MANAGEMENT
Buzzer
Fan Control
User Interface
Auxiliary Power Supply
+18V
+3.3V

Efficiency:

- Induction cooking is quite efficient, which means it puts less waste heat into the kitchen, can be quickly turned off, and has safety advantages compared to gas hobs (cooktops). Hobs are also usually easy to clean, because the hob itself does not get very hot.

Parts of induction cooker

- Micro crystal cooking plate
- Body
- Cooking zone
- Control panel
- Display
- Air outlet
- Air inlet
- Main cord

Internal parts of induction cooker

How does a induction cooker work?

- An induction cooker transfers electrical energy by induction from a coil of wire into a metal vessel that must be ferromagnetic. The coil is mounted under the cooking surface, and a high frequency (e.g. 24 kHz) alternating current is passed through it. The current in the coil creates a dynamic magnetic field.

Function of induction cooker:

- In an induction cooker, a coil of copper wire is placed under the cooking pot and an alternation current is passed through it. The resulting oscillating magnetic field induces a magnetic flux which repeatedly magnetises the pot, treating it like the lossy magnetic core of a transformer. This produces large eddy currents in the pot, which because of the resistance of the pot,heats it.

Possibilities faults and remedies

Different types of health Appliances

- Pain relief laiser
- Treadmill
- Blood pressure meter
- Diabetic tester
- Nebulizer
- Foot bath massager
- Massage chair
- Electro cardiogram monitor


beurha


79
99
15
81


120
80
shutterstock.com • 560263513

Treadmill

A **treadmill** is a device generally used for walking or running or climbing while staying
in the same place.

Operation of Treadmill

- Running platform
- Vertical support
- Handle bars
- Console

General Treadmill Tips:

1. **Talk to your doctor if you have joint or back problems**
2. **Buy some comfortable running shoes.**
3. **Drink 16 to 24 fluid oz**
4. **Swing your arms**
5. **Pay attention to the settings on the equipment**
6. **Use the safety clip**

Operation of digital blood pressure meter

- Pump
- Valve
- Cuff
- Monitor

Diabetic tester

- Diabetic meter
- Test strip
- Laching device

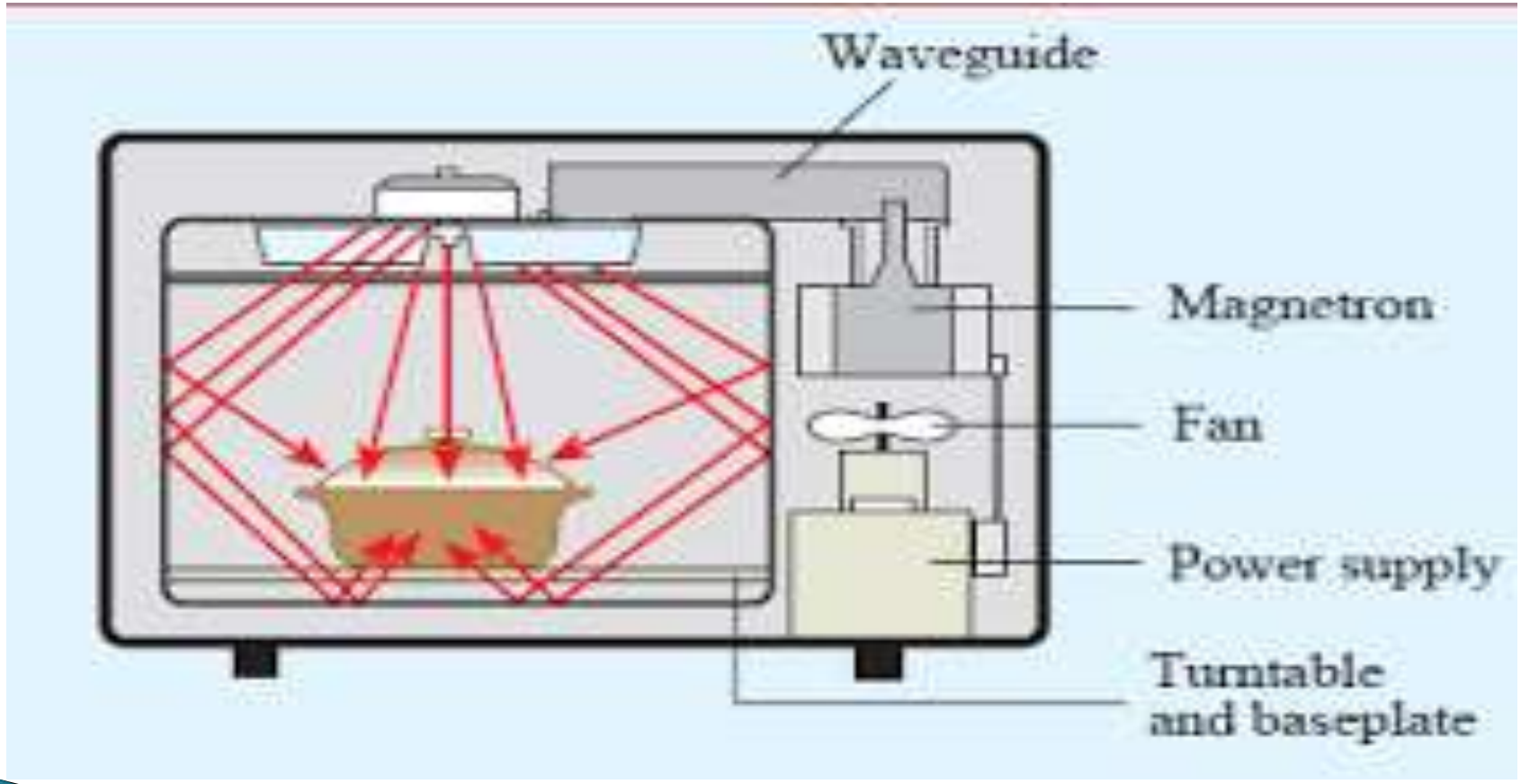
Microwave oven

- A microwave oven (also commonly referred to as a microwave) is an electric oven that heats and cooks food by exposing it to electromagnetic radiation in the microwave frequency range.

- 2.5 GHz frequency radio wave is used

Features of Microwave Oven

- **Saves Time**
- **Nutritious values of food are retained**
- **Moderate Power consumption**
- **Easy to use**
- **Easy transportation**
- **Easy maintenance**
- **Pollution free**


Waveguide
Magnetron
Fan
Power supply
Turntable
and baseplate

Parts of Microwave oven:

1. Oven light
2. Blower Motor
3. Stirrer Motor
4. Cook switch
5. Dual latch switch
6. Cook relay
7. Timer assembly
8. Thermo cut out
9. Magnetron tube
10. Power Transformer
11. Voltage doubler circuit
12. Door safety switch

Components used in Microwave oven

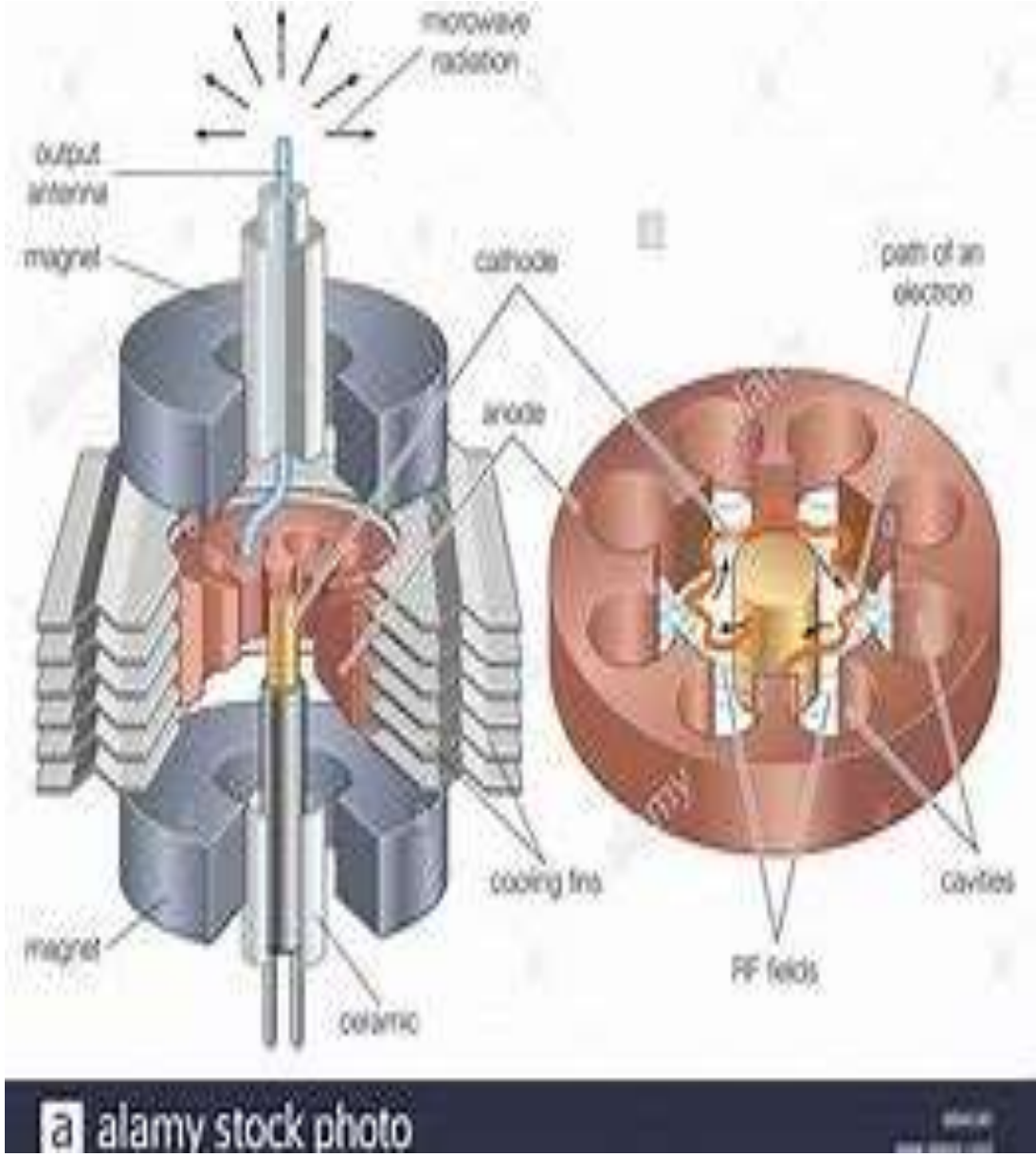
Power Cord

RFI Filter

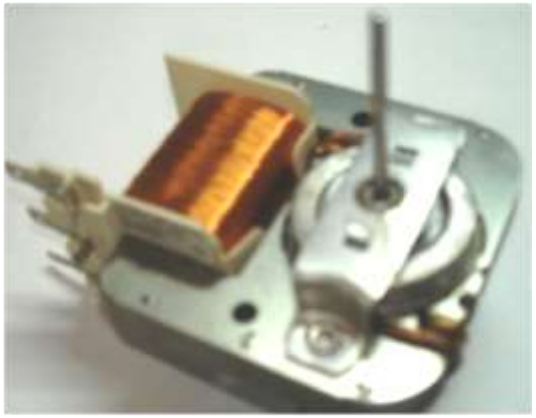
Interlock Switches

Grill Heater

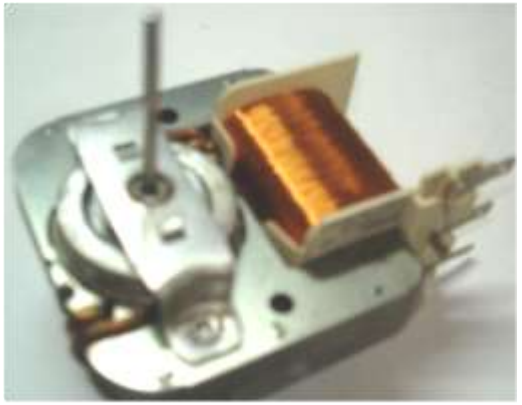

Microwave Oven Magnetron
Magnetron
WITOL-2M
219J 218J


microwave radiation
output antenna
magnet
cathode
path of an electron
anode
cooling fins
cavities
magnet
RF fields
ceramic
alamy stock photo

Convection Heater



Convection Motor



Fan Motor

Thermal Cutout

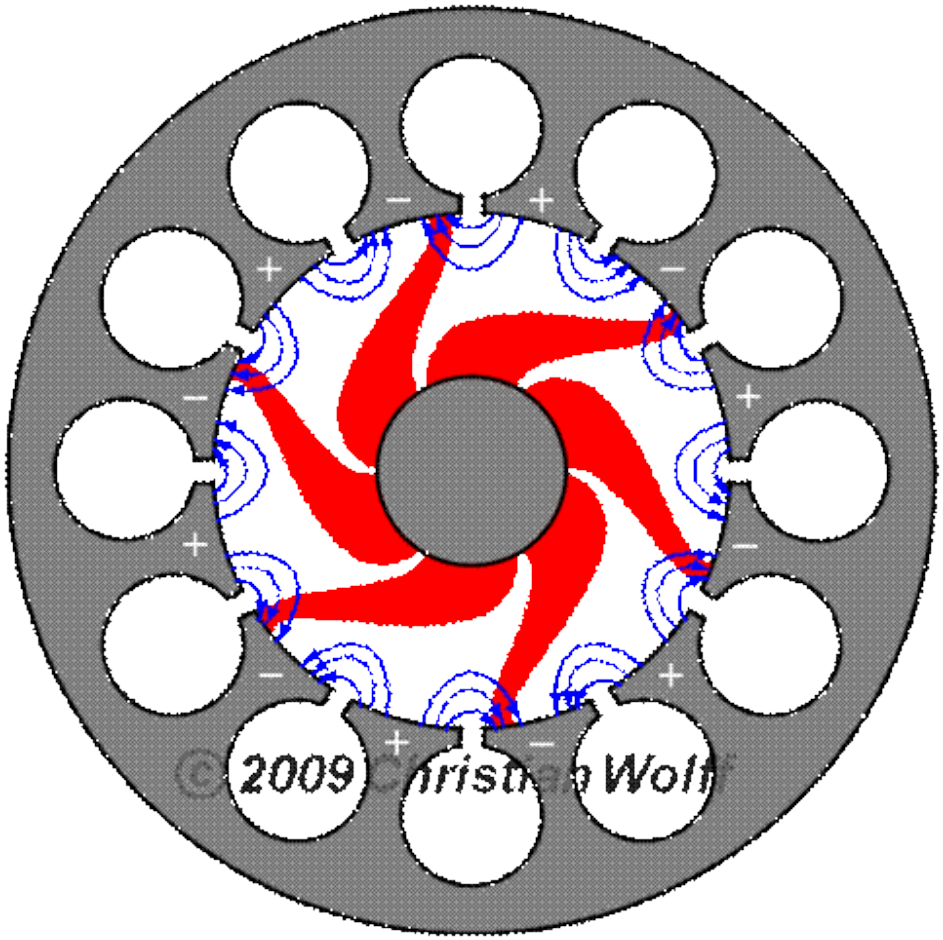
HV Transformer

PCB

Thermistor

Oven Lamp

Travelling electron bunches



Working principle

- The microwaves that penetrate the food have an electric field that oscillates 2.45 billion times a second, a frequency that is well absorbed by polar liquid molecules such as water, sugars, fats and other food molecules.

- Water interacts with the microwave:
  - flipping its orientation back and forth very rapidly
  - bumping into one another and producing heat, cooking the food.

Which utensil we cant use in microwave oven?

- Glass, Paper, ceramic, or plastic containers can not used in microwave cooking because the microwaves pass through them

- Metal reflects microwaves
  - Unsafe to have metal pans/aluminum foil in oven, may damage oven

Health issues:

- It is known that microwave radiation can heat body tissue the same way it heats food.
- Exposure to high levels of microwaves can cause a painful burn
  - Ex. the lens of the eye ~ exposure to high levels of microwaves can cause cataracts.
- Still uncertain in the effects of humans from long term exposure to low level of microwaves
  - Still experimenting
- Best to stay a way (an arm's length) in reducing exposure to microwaves

Public Addressing System

A public address system (PA system) is an electronic system comprising microphones, amplifiers ,loudspeakers and related equipment. It increases the apparent volume (loudness) of a human voice, musical instrument, or other acoustic sound source or recorded sound or music.

Where it is used?

- PA systems are used in any public venue that requires that an announcer, performer, etc. be sufficiently audible at a distance or over a large area. Typical applications include sports stadiums, public transportation vehicles and facilities, and live or recorded music venues and events.

Picture

Requirements of good public Addressing system

- Sound energy should be distributed properly
- Eco should be less
- System should be grounded efficiently
- Proper microphone and speaker should be used
- Must be acoustic feedback free

Classify public Addressing system

- Deeping on uses its two type:

1.Indoor public Addressing system

2. Outdoor public Addressing system

- Depending on power its four types:

1.Mini public Addressing system

2.Small public Addressing system

3.Medium public Addressing system

4.Large public Addressing system

- Depending on configuration its four types:

1.Speaker on stands

2.Stage stack

3.Cluster array

4.Flown line array

- Indoor public addressing system: Classroom, Theater.
- Outdoor public addressing system: stadium

1.Mini public Addressing system: less than 30 Watt

2.Small public Addressing system: 30-50 Watt

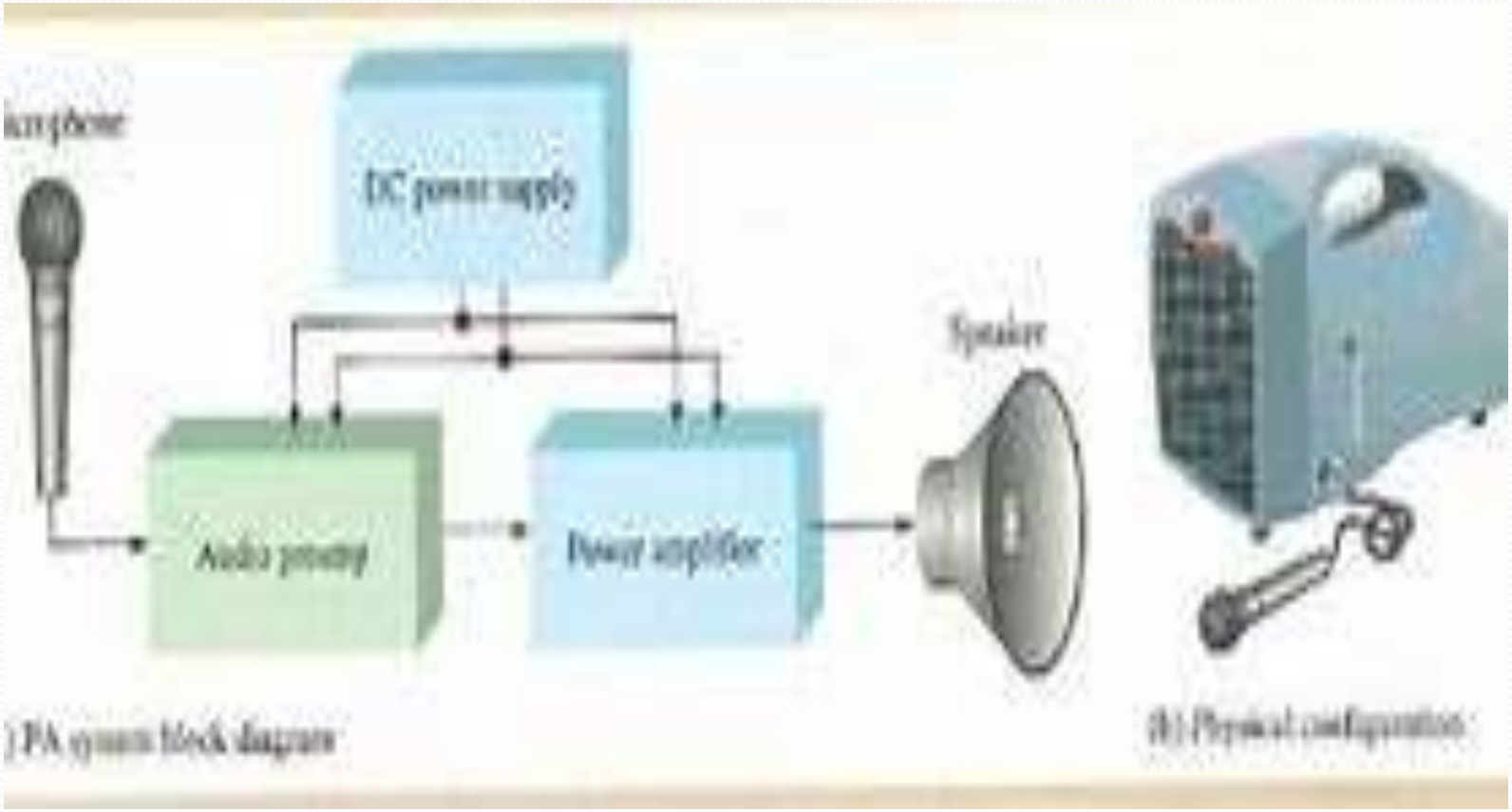
3.Medium public Addressing system: 50-150 watt

4.Large public Addressing system: Above 150 watt

Different units of public addressing system

- DC power supply
- Microphone
- Mixer stage
- Audio pre-amplifier
- Power amplifier
- Speaker

Block diagram of PA system:



Working principle of public addressing system

A PA system may include multiple microphones or other sound sources, a mixing console to combine and modify multiple sources, and multiple amplifiers and loudspeakers for louder volume or wider distribution.

Do you have any questions??

Refrigerator

- A **refrigerator** (colloquially **fridge**) consists of a thermally insulated compartment and a heat pump(mechanical, electronic or chemical) that transfers heat from the inside of the fridge to its external environment so that the inside of the fridge is cooled to a temperature below the ambient temperature of the room. It is an food storage technique in developed countries.

How Refrigerators and Freezers Work

A short history of refrigerators

- Before the refrigerator was invented, some people would use ice from frozen lakes to keep food cool, but it was difficult and expensive to move so much ice
- The first refrigerator used by many people was the "Monitor-Top" refrigerator starting in 1927
- Home freezers started being used in the U.S. in 1940

Step 1 continued

- When the temperature inside the refrigerator is above a certain set temperature, the thermostat turns on a compressor
- A thermostat is a thermometer that can turn something on
- A compressor is a machine that can squeeze a gas, which makes it have a smaller volume
- The compressor is what you hear humming

Step 2

- The very warm refrigerant goes through a coil outside (usually behind) the refrigerator where it loses heat to the air outside
- A coil is a long, snake-like tube
- This outside coil is called the “condenser coil” because as it cools, the refrigerant changes from a gas to a liquid (condenses) and gives off heat

Step 3

- After the refrigerant has cooled down from giving heat to the air outside the fridge, the “expansion valve” opens to let the liquid refrigerant pass through it, into the coils inside the refrigerator
- A “valve” is a small hole that can be opened or closed, and “expansion” means getting bigger, so what does “expansion valve” mean?

Step 4

- The refrigerant expands (gets bigger) as it goes through the expansion valve
- It also decreases in pressure and temperature
- The refrigerant absorbs (takes in) heat from inside the refrigerator because it as a lower temperature
- The refrigerant is now ready for step 1 again!

Home Security System and Surveillance system

Using different hard ware, software and devices to protect the system from unexpected incident. By ensuring security of home through this method is called home security system.


Beam Sensor
Door Sensor
PIR Sensor
Ceiling Motion Sensor
Smoke Sensor
Glass Break Sensor
Camera
Vibration Sensor
Siren Alarm
LPG Gas Sensor

History

Marie Van Brittan Brown was an African-American inventor who invented the home security system in 1966, along with her husband Albert Brown. They jointly applied for a patent, which was granted in 1969.

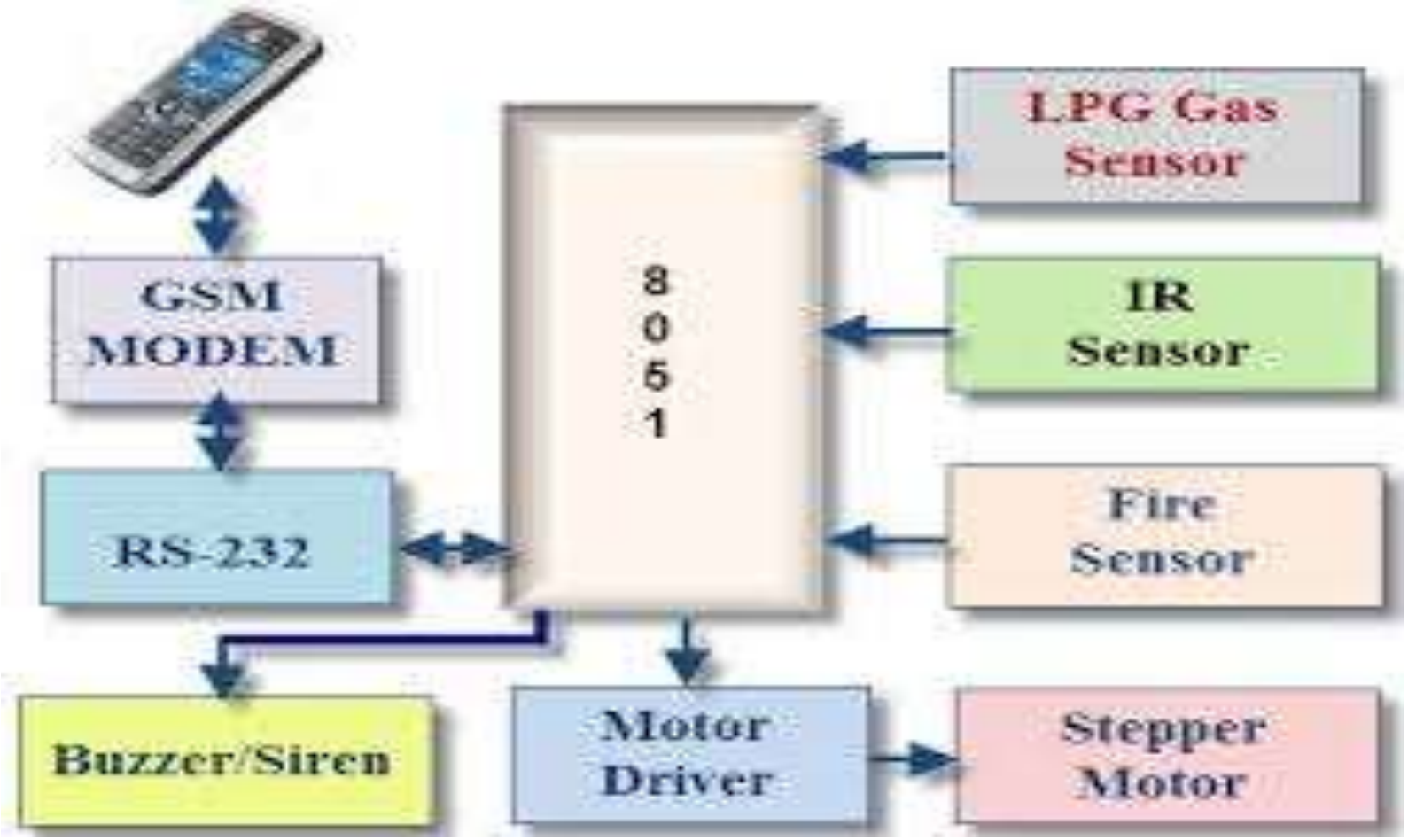
Types of Home Security System

- Monitored Security System
- Unmonitored Security System
- Wireless Alarm Security System
- Electric Current home Alarm System


Magnetic
Door
Switch


Making of
Laser Light Security Alarm

Home Security system with remote monitoring:



The parts of remote monitoring security system:

1. Devices: security panel, control box, wireless detector.
2. Monitoring: Computer monitor
3. Remote Access: Internet protocol(IP)enabled Mobile phone , Laptop , PC.

Devices

Monitoring and Remote Access

Connection diagram of CC camera, monitor and DVR


MX
Connect Power Adapter
of the CCTV Camera

Possible faults , causes and remedies:

- Do you have any questions??

WASHING MACHINE

- A washing machine (laundry machine, clothes washer, or washer) is a home appliances used to wash laundry.

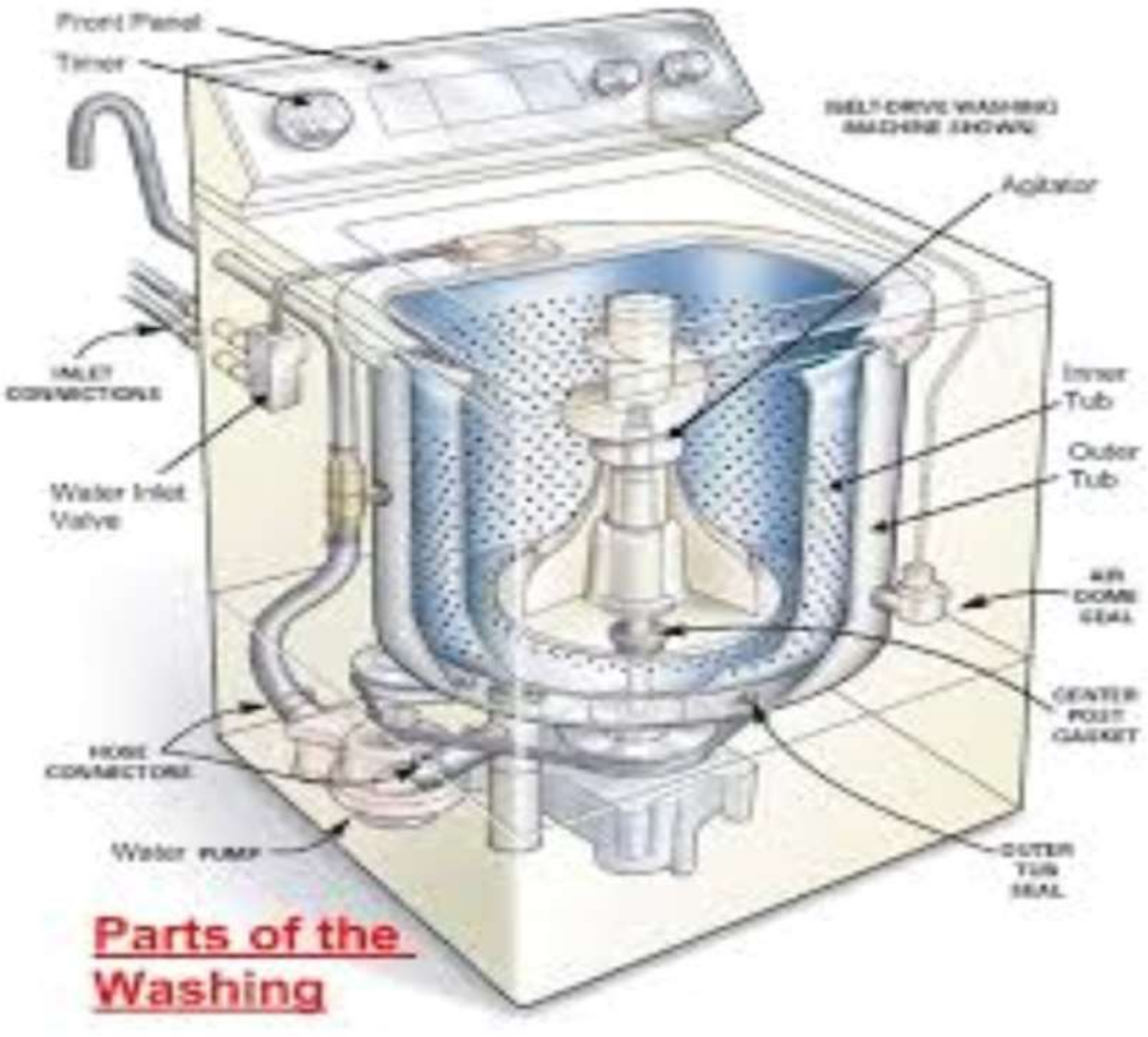
- The term is mostly applied to machines that use water as opposed to dry cleaning(which uses alternative cleaning fluids, and is performed by specialist businesses) or ultrasonic cleaners.
- The user adds laundry detergent, which is sold in liquid or powder form, to the wash water.

TYPES

- 3 types of washing machine are available:
- **Conventional type**
- **Semi automatic type**
- **Automatic type**

DIFFERENT PARTS OF WASHING MACHINE

- Water flow gauge
- Water lid
- Rinse water level adjuster



Parts of the Washing

Vacuum Cleaner

- A vacuum cleaner, also known simply as a vacuum, is a device that causes suction in order to remove debris from floors, upholstery, draperies and other surfaces. It is generally electrically driven.
- The dirt is collected by either a dust bag or a cyclone for later disposal. Vacuum cleaners, which are used in homes as well as in industry,

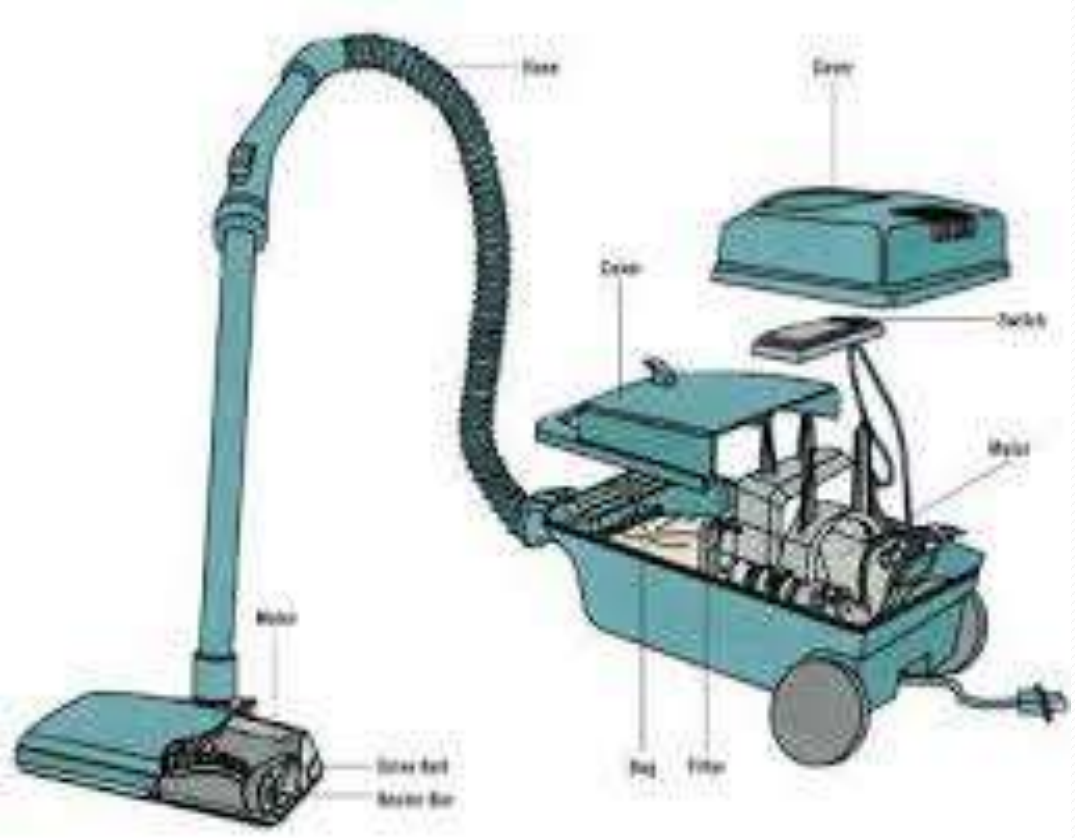

Henry
200

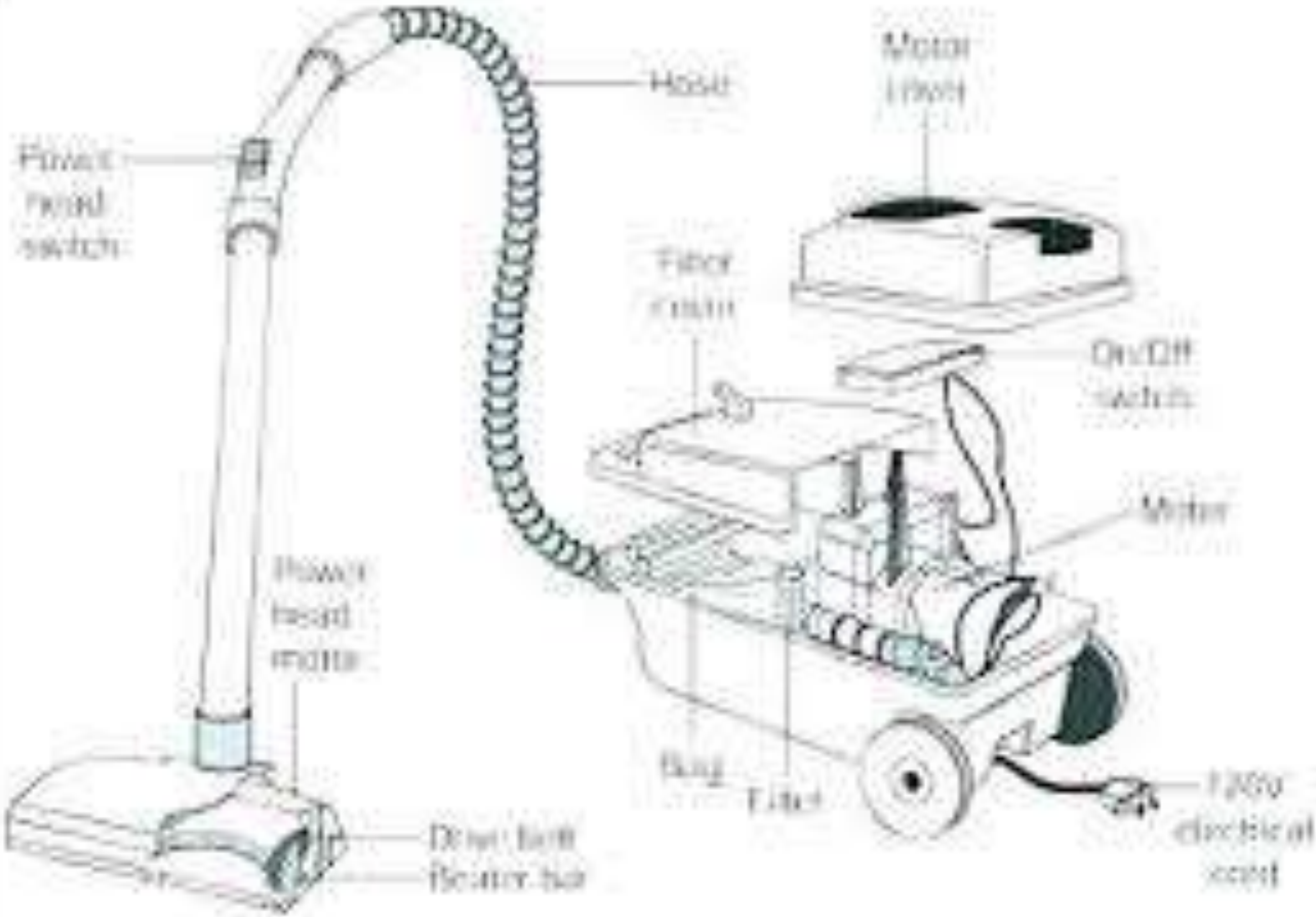
Types of vacuum cleaner

- Mainly two types**:1. Upright type 2. Cylindrical pot type**
- Depending on uses:
- **Canister**
- **Drum**
- **Wet/dry**
- **Backpack**
- **Cyclonic**
- **Robotic**

Different Parts of vacuum cleaner

- Floor nozzle
- Hose assembly
- Hose inlet
- Vac gauge
- Tool pocket cover
- Cord rewind pedal
- On off switch
- Dust cover
- Dust bag
- Blower
- Fan motor
- plug

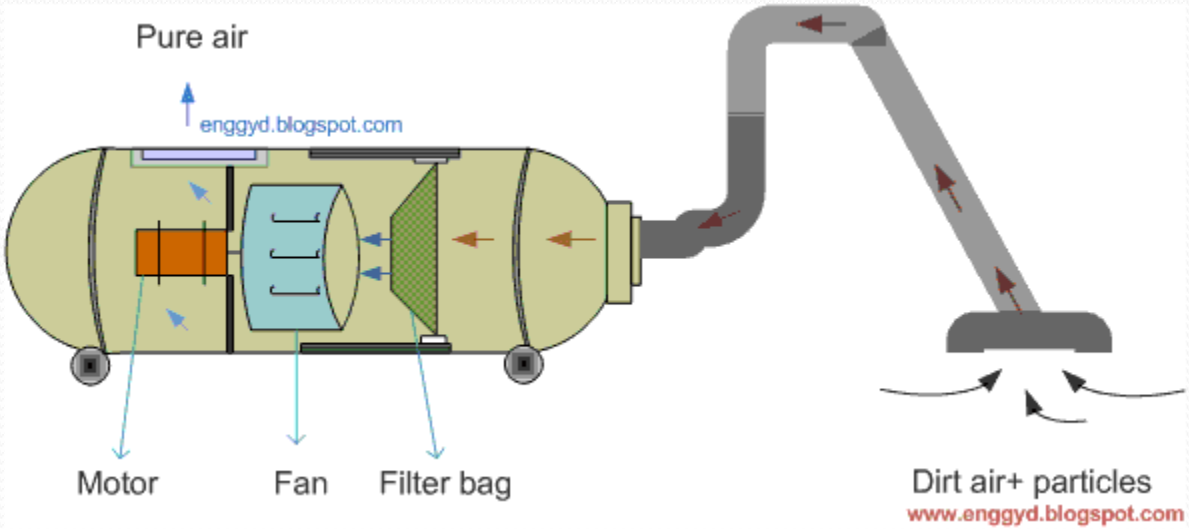




Hose
Motor
On/Off
Motor
Power
head
Bag
Filter
120V

Working principle of vacuum cleaner

- When a centrifugal fan rotates it makes the air to flow by adding it external kinetic energy.
- Air is sucked from behind and pushed forward with pressure and so negative pressure it creates behind the fan.
- An ideal vacuum cleaner has such centrifugal fan in it connected to a motor.
- This unit has suction and discharge connections, on the suction side filter bag is fitted before the hose connection.
- The discharge has another air purifier filter and opened to the atmosphere.
- When the electric power is given the motor rotates and so the centrifugal fan.
- Air from the suction side is sucked into the unit, along with the air all air born particles, cat allergen, mist, dirt, and small solid particles are carried to the suction filter.
- They are trapped in the filter and dirt free air is pushed out from the discharge opening.


Pure air
enggyd.blogspot.com
Motor
Fan
Filter bag
Dirt air+ particles
www.enggyd.blogspot.com