

Wax bath

Its medical instrument used water as a media of heat transmission. Is one of the devices the task used in physical therapy wide spread and includes the joints of the body and uses the principle of latent heat through the wax of the type which is a special wax (paraffin), which is a special kind of prefer to use because it is gaining heat slowly and lose it slowly and to keep the parties and parts warm to allow for the place.

1. Operation Principle

The principle of operation of the device is heating water and the way you are melting wax is used in physical therapy and treatment is a natural by immersion may not be possible in some places access to the immersion are used way Spilling the places to be treated or using the brush to get to difficult places and prefer to use paraffin wax so as to acquisition of the heat slowly and the loss of slowly making it a good treatment of the joints to keep them warm for a long time that the treatment of the wax up (approximately 54 °C).Figure 1 shows the wax bath.



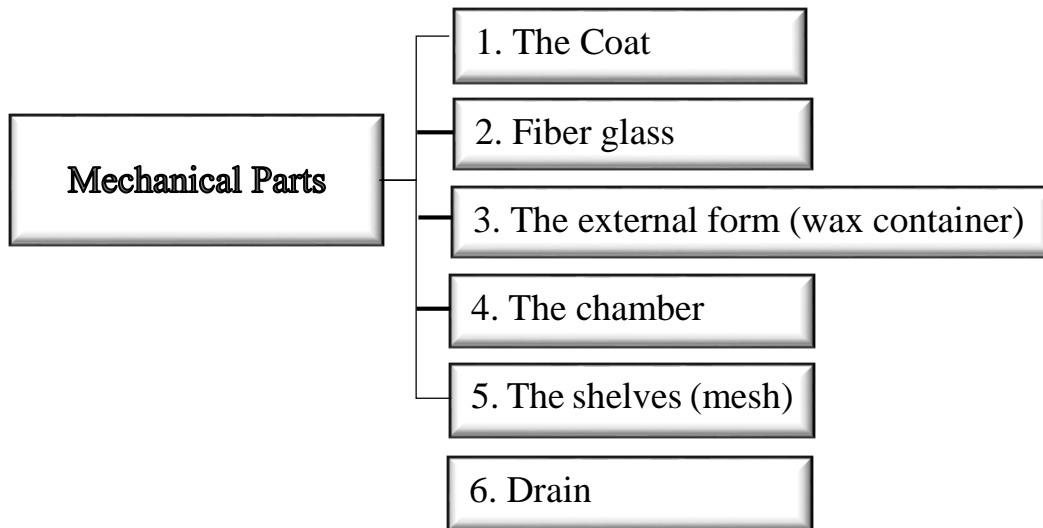
Figure 1: shows Wax bath

2. Parts of a Water Bath

Water bath consist of two parts, they are:

1. Mechanical part.

2. Electrical part



1. The coat: The coat is made of aluminum or stainless steel because it's resisting the mechanical shocks, resisting the oxidation and rectangle solid shape to be easily placed anywhere. The coat consists of several surfaces of an isolator material to prevent heat from getting outside.

2. Fiber glass: There are two type of it:-

- a) **Brown fiber glass:** it is cheap, but dangerous substance because it causes inflammation in the chest that should be wary of dealing with.
- b) **Yellow fiber glass:** it is available by many and also a serious but less dangerous than brown, because of the sensitivity and be careful by wearing gloves.

The advantage of fiber glass is that:-

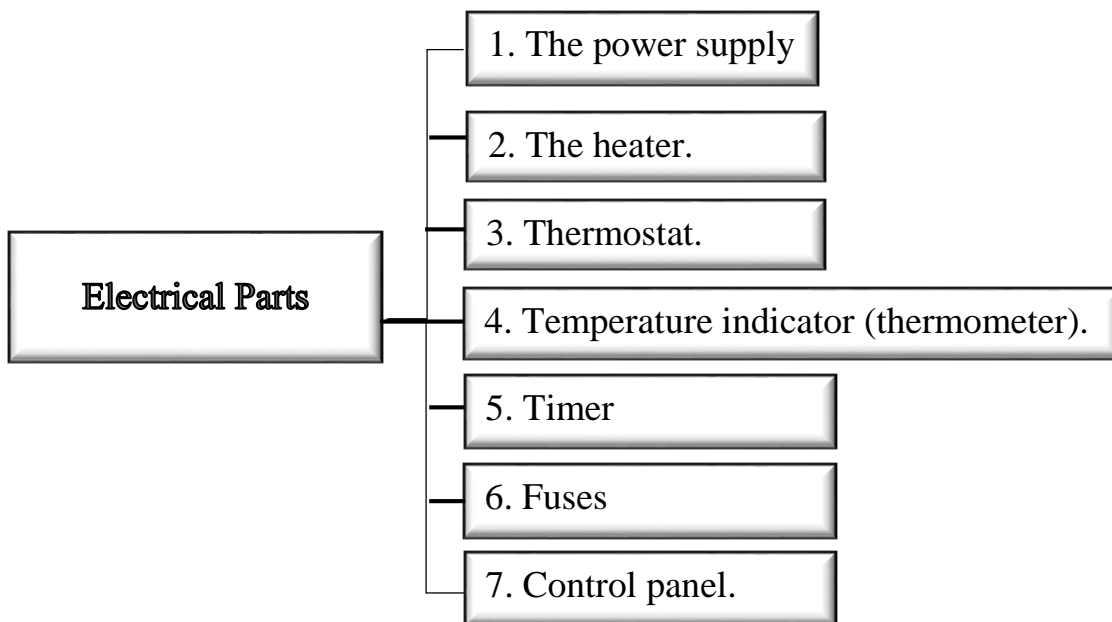
- a) 1-It is a good insulator of heat and use it in the water bath due to lack of access of heat from inside the device to the outside.
- b) 2- Maintain the internal temperature.
- c) 3-Very bad conduction heat so it is suitable for heat insulation purpose.

3. Wax container: It is a container containing wax [paraffin wax] used in the treatment process and is made of stainless steel and be mobile in order to ease switch to different parts of the body.

4. The chamber: The chamber is completely made of aluminum or stainless steel, rectangular solid shape to suit dealing with various objects, it has thermally insulated from all other part .It also contains a container of water must be distilled water because it contains salt which is responsible for melting the wax and keep it in a liquid state by heating the water by heater.

5. The shelves (mesh): The mesh is made of aluminum or steel it contains of group of holes to increase thermal conductivity.

6. Drain: It is water regulator (tube), used to vacuum the water from the chamber, it is used as manually maintenance or calibration to remove the waste water or uncomforted table water.



1. Power supply: The used supply in water bath is 220v — 50Hz the step down transformer and rectifying circuit (AC to DC convert) to run the control panel if the parameters, numeric or other departments in the modern fashion.

2. The heater: The electric heating system is the system in which heating produce by rising of temperature by the passing electric current through a conductor having a high resistor to current flow; it is only placed in base of the instrument.

3. Thermostat: Is a sensor of heat connecting directly with heater, separate the heater in certain degrees and used to protect the device.

4. Temperature indicator: Two ways are used in temperature indicator there are thermometer (used to measure temperature of material) and thermocouple that identified the internal temperature.

5. Timer: There are two type of timer electrical and mechanical at range 5-60 min. given period of time required for sterilization.

6. Fuse: To protect the circuit from high current, high loads, short circuits.

7. Control panel: Contains several elements:-

- a) 1-The most important is indicator power lamp usually green,
- b) 2- Indicator heater lamp usually red, contain
- c) 3-Switch on/off
- d) 4-Timer
- e) 5- Knob

3. There are three reasons to use paraffin wax:

1. The wax vaporizes in very high temperature.
2. The wax considers low electric connectivity material.
3. The waxes miss the heat slowly.
4. The wax keeps the heat to possible long time (20-30 minute).

4. Treatment Method

1. Remove watch and rings, in the treatment area, if rings cannot be removed, cover them with several thicknesses of gauze and hold the gauze in place with masking tape.
2. Protect the patient clothing from the paraffin because it causes skin scrape (sensitivity),
3. Explain to the patient that the paraffin will feel hot, but it not burn.
4. Inspect the part to be treated:-
 - a) The skin must be clean to avoid contaminate the tank. If it is not clean, the patient must be wash it with soap and water.
 - b) The skin must be dry and free from perspiration because it may cause burn.
 - c) The skin must be free from draining lesions, rashes and scratches which must be covered by gauze.
 - d) Check skin sensation, if skin sensation is not normal, use wax with caution.
 - e) Be sure the bath temperature is not over 54.4 degree centigrade.

5. The Advantage and Disadvantage of Wax Bath is Shown as Table Below:-

Advantage	Disadvantage
1. Fast, acting, drug, free heat therapy.	1. Sedimentation occurs at the bottom of the bath, the bath must be cleaned regularly at least twice a year.
2. Proven effective to smooth pain and stiffness.	2. Contamination of the wax by atmospheric dust may occurs unless the lid covers it when not use.
3. Effective on arthritis, joint stiffness, muscle spasms, dry cracked skin and more	
4. Versatile, safe, and easy to use.	

6. Faults and Repair

Which is a few faults due to the lack of electrical parts in the device because it does not contain many electronic parts and faults in this device is (heater- thermostat - sensitive - switch on/off - fuse) and the repair is to replace damaged parts .