Jan. 3, 1956 N. MacLEOD 2,728,962

FOMENT STERILIZER

Filed Dec. 2, 1952 2 Sheets-Sheet 1

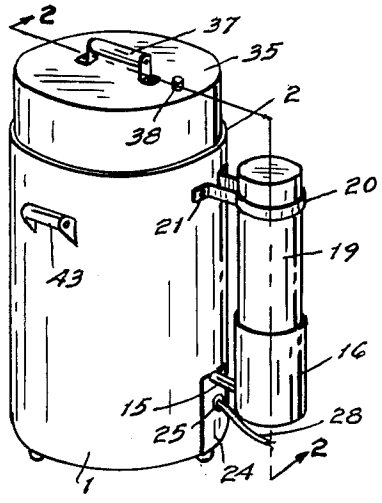


Fig 1

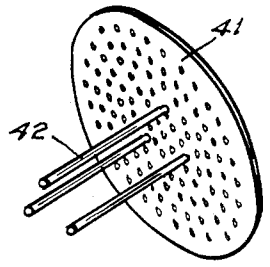


Fig 4

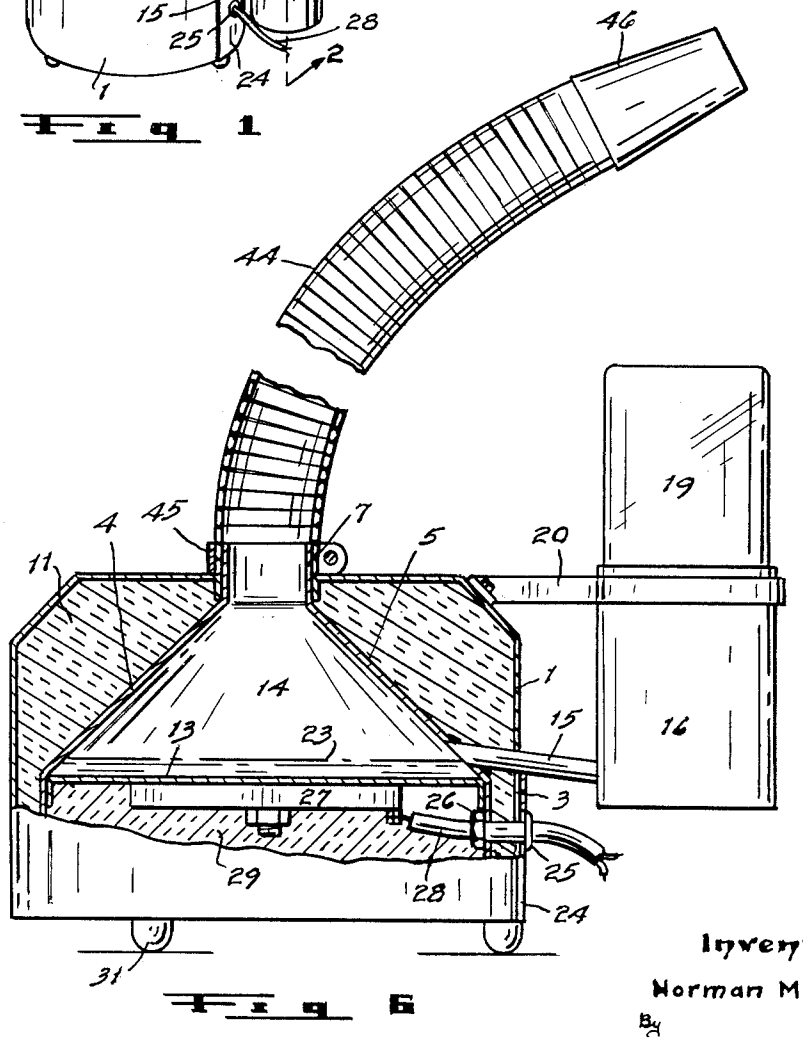


Fig 6

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FOMENT STERILIZER

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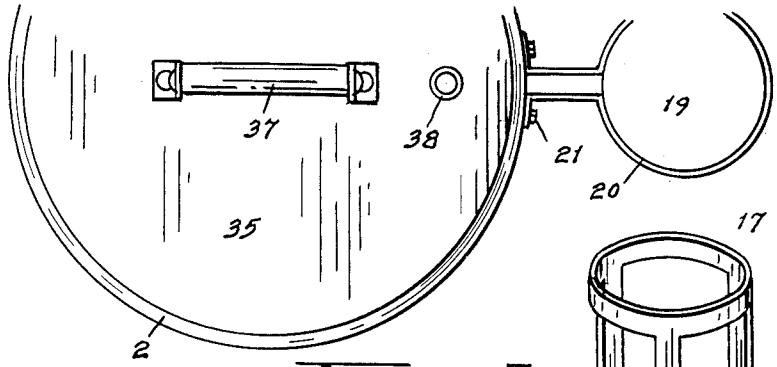


Fig 3

Fig 5

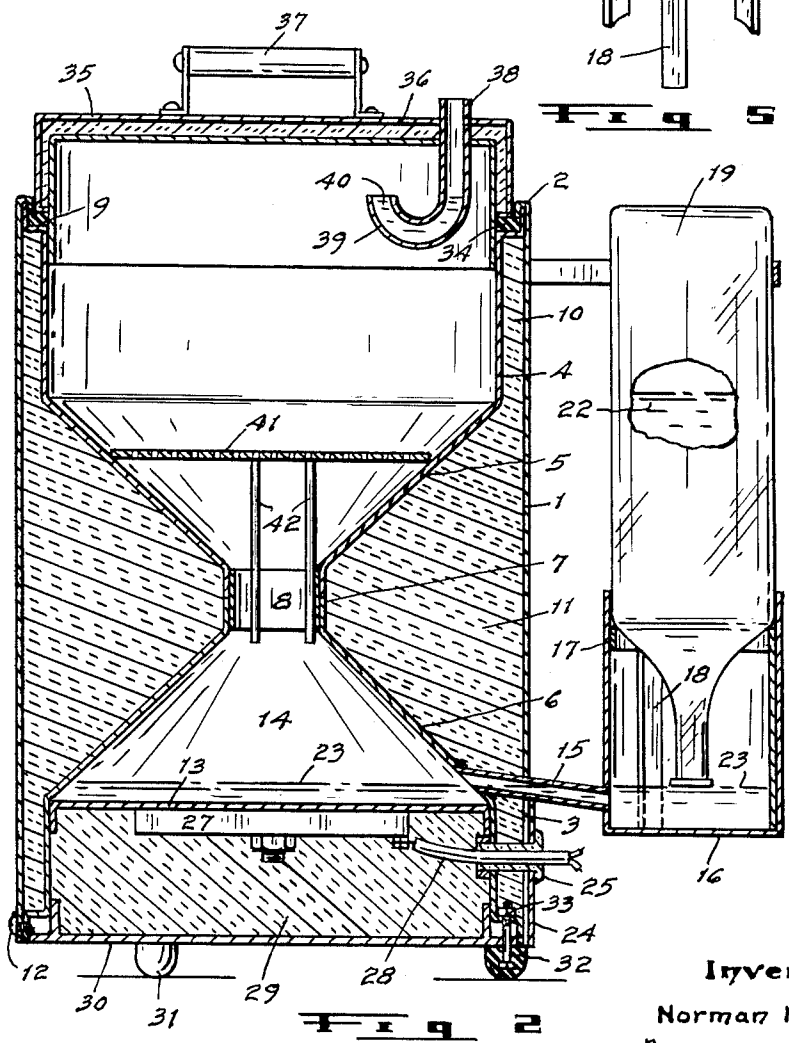


Fig 2

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United States Patent Office

2,728,962

Patented Jan. 3, 1956

2,728,962

FOMENT STERILIZER

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Application December 2, 1952, Serial No. 323,597

1 Claim. (Cl. 21—95)

This invention is a unit particularly designed for the heating and sterilization of foments (hot moist cloths) as used in hospitals. Such foments are of various sizes and are used extensively on different parts of the human body in curative treatments where applied heat is advantageous. The invention is also designed so the same construction can be used to provide an inhalator.

The principal object of the present invention is to provide a portable unit of convenient size for manual movement to any location required, such as adjacent a hospital bed, so that the foments are readliy accessible and where the patient, if capable, can apply the foments himself, or conveniently breathe the inhalations.

Further objects of the invention are to construct an insulated unit for holding a number and variety of foment cloths, provide means for quickly heating a small quantity of water therein to generate steam, and to design said unit such that the driest steam will be directed through said foments to raise the temperature therein for the purpose above specified.

Further objects of the invention are to provide means for maintaining the level of the heated water in said unit, raise the pressure of the steam slightly for superheating of same, and for returning condensation back for further vaporization.

Still further objects of the invention are to design the unit in a knock-down construction for simplicity of manufacture, assembly, cleaning and repair; simple in operation and efficient for the purpose; compact to occupy a minimum of space; of pleasing appearance and reasonable in cost.

With the above important and other minor objects in view, which will become more apparent as the description proceeds, I have produced a construction consisting primarily of a vertical cylindrical casing having an hourglass-shaped liner therein with insulation therebetween; an exterior reservoir automatically regulating a shallow depth of water at the bottom of said liner which is heated to deliver superheated steam of regulated pressure to the upper part of the liner where the foments are positioned for heating and sterilization while at the same time a removable cover is provided for their insertion or withdrawal. The details of construction will now be described, reference being had to the accompanying drawings in which:

Figure 1 is a perspective view of the unit complete.

Figure 2 is an enlarged vertical sectional view taken through the unit at 2—2, Figure 1.

Figure 3 is a partial plan view of the unit shown in Figure 2.

Figure 4 is a perspective view of a strainer type of partition for holding the foments.

Figure 5 is a perspective view of the reservoir bottle support.

Figure 6 is a modified form of construction for a simple inhalator.

In the drawings like characters of reference indicate corresponding parts in the several figures.

The casing 1 of the unit is a sheet metal cylinder having the upper end inwardly rolled, as at 2, to form an annular groove therein. The lower edge of the casing is provided with a single vertical slot 3 which extends upwardly a short distance for a purpose later to be explained.

An inner hourglass-shaped liner 4 is received within the casing 1. This liner is composed of two funnel-shaped members 5 and 6, inverted in respect to each other, and with the spout portions thereof abutting and held together by an interior ring or short tubing 8 which may be secured as by welding. The enlarged ends of the funnel members 5 and 6 are stepped outwardly to form an annular shoulder 9 in contact with the interior wall of the casing 1 and provide an annular space 10 between the enlarged part of the funnels and the casing for insulation 11 which also fills the space between the central spouts and the casing. The annular wall of the shoulder 9 on the upper funnel 5 is received in the groove formed by the roll 2 while the same wall on the bottom funnel 6 is held to the casing 1 by screws 12. An interior horizontal partition 13 closes off the upper enlarged part of the funnel 6 and forms a bottom for a chamber 14 thereabove, the coned portion of the funnel forming the roof thereof.

A short tubing 15 connects the chamber 14, through the slot 3, with a cup-shaped reservoir 16 which is positioned exterior of but adjacent the casing 1. One end of the tubing is secured, as by welding, to the coned roof of the chamber 14 in a water-tight joint and the other end is secured in the same manner to the reservoir 16. Accordingly, the tubing supports the reservoir and water can pass from the reservoir to the chamber 14. It will be noted that the tubing is at a slight upward slope in passing to the chamber.

A ring 17, having three downwardly extending legs 18 (see Figure 5) is received within the cup-shaped reservoir 16, the legs resting on the bottom thereof. An inverted, necked bottle 19 has the shoulder of the neck resting on and within the ring 17 so that the bottle is supported vertically with the open end thereof spaced from the bottom of the reservoir 16. The upper closed end of the bottle is encircled by a strap 20, the ends of which are secured to the casing 1 by bolts 21 and this brace holds the bottle firmly in the inverted vertical position.

From the above it will be seen that water 22 in the bottle will run down the neck into the reservoir while air will bubble up the neck until the level of the water in the reservoir shuts off such air. The water will then stop running out. Water from the reservoir will pass up the tubing 15 into the chamber 14 until the water level therein is the same height as the water in the reservoir. This level is indicated at 23. As the water is used up in the chamber, the level will drop, air again passes up the neck of the bottle and water will again run out to return the level. In this connection it might be mentioned that the legs 18 will be made the correct length for the proper water level but these legs may be bent or shortened if a lower level is desired.

A plate 24 closes over the slot 3 in the casing 1 and this plate extends up under the tubing 15. A hole is centrally provided in the plate so that a tube insulator 25 can pass therethrough and through the wall of the lower funnel 6 with a locking nut 26 on the inside end. When the nut is tightened the insulator will hold the plate 24 in position, or bolts (not shown) can secure it to the casing 1.

An electric element 27 is suitably connected to and supported on the bottom of the partition 13 and power wires 28 connect to same with the wires passing out through the tube insulator 25 for connection to any suitable power supply. The space below the element is filled with insulation 29 and a cover plate 30 holds this insulation from falling out. Rubber legs 31 support this cover plate and unit

while bolts 32 pass through the legs, through the cover plate, and screw into nuts 33 carried by the bottom of the funnel 6.

The upper shoulder 9 of the funnel 5 receives a rubber gasket 34 and a circular inverted cup-shaped cover 35 is supported thereon. This cover is double walled with insulation 36 therebetween for heat retention while the inner wall projects downward past the gasket to direct condensation back to the funnel 5. A handle 37 is provided centrally of the cover for lifting same while at one side thereof the cover is provided with a vertical piping 38 therethrough which terminates therebelow in a return-curved trap 39. In the operation of the device this trap fills with condensed water 40 as high as the end of the trap.

A circular perforated partition 41 sits on the cone of the funnel 5 and forms a support for the foments (not shown) which are to be heated and sterilized in the unit. Three legs 42 (see Figure 4) project down from the centre of this perforated partition to pass through and be guided in the ring 8 to hold the partition horizontal while also permitting its withdrawal.

A pair of handles 43 are attached, one on either side of the casing 1, so that the whole unit can be carried from place to place, or bed to bed, or if casters are used in place of the rubber legs, it can be pushed.

From the above description it will be seen that the unit is made by a knock-down construction as the various parts can be made separately and assembled in a dismantling arrangement, as hereinafter explained.

The two funnels forming the liner can be connected by the ring 8 before insertion in the casing 1. The tubing 15 with the reservoir can be connected at this time and the partition 13 attached. After the insulation 11 is filled in around the funnel liner, it can be slid up inside the casing 1 with the tubing 15 sliding up the slot 3. The upper edge of the liner enters the groove in the roll 2 while the bottom edge is secured to the casing 1 by the screws 12. The plate 24 is positioned, the tube insulator and nut attached and the plate is held. The element is then secured to the partition 13 and the power wires passed through the tube insulator. The element is then covered with insulation and the bottom plate with the legs fastened in place. The strap 20 is secured to the casing 1, the bottle is slipped therein, the perforated partition 41 dropped onto the funnel 5 and the handled cover placed thereover. The assembly is then complete.

In operation and with power turned on, the element will heat the water above the partition 13 and steam will be generated. As water covers the lower end of the tubing 15 the steam must pass up through the ring 8. Any condensation forming on the coned roof of the chamber 14 will drain back. As steam rises in the open part of the funnel 5 it expands and any condensation produced will fall on the cone of the funnel 5 and drain back through the ring. Accordingly, only dry steam will pass through the perforations of the partition 41 and enter the foments thereon. As the trap is filled with water, the steam will build up a slight pressure in the liner until it slips past and bubbles through the trap to escape out the piping 38. Condensation from the piping will maintain the water in the trap and any excess will drain back into the liner so that no water will come out of the piping to disfigure the cover exterior. By letting a certain amount of steam escape in this way, dry steam will be continually passing through the foments to keep them at the correct temperature with very little moisture content, if any. The result is that the pressure of the steam is constant, is slightly superheated, and the temperature of the foments are relatively constant. As the unit is small and compact, it occupys a minimum of space and is handy for a nurse to apply the foments. If the patients are capable, they can apply the foments themselves.

The device shown in Figure 6 is a modified form of construction which is practically the same as the lower half of the foment unit, but used for an inhalator. The steam generation is accomplished in the same manner but the foment chamber is eliminated. The upper spout of the funnel 6 extends through the upper part of the casing 1 and receives a flexible tubing 44 which is secured thereto by a clamp 45 while the upper end of the tubing carries a nozzle 46. The tubing may be bent as desired so that, when the steam is generated, as explained for the foment unit, the patient merely has to hold his face slightly above the nozzle to breathe the steam eminating therefrom.

What I claim as my invention is:

A foment sterilizing unit comprising in combination a vertical casing, a removable cover on said casing, a water trap in said cover, an hourglass-shaped liner within said casing, said liner comprising an upper part and a lower part with a restricted junction therebetween, a chamber in said lower part, a reservoir adjacent said casing and fluidally connected with said chamber, means for maintaining a predetermined level of water in said reservoir and in said chamber, means for heating the water in said chamber and a partition for supporting foment cloths in said upper part, said water trap taking the form of a vertical pipe extending through said cover, and extending internally thereof, the lower end of said pipe being curved upwardly, condensate formed within said curved portion acting to build up steam pressure within said device and to permit escape of steam therethrough, thereby maintaining said pressure and permitting movement of steam through said partition, said partition comprising a perforated disc adapted to engage the wall of said upper part immediately superjacent said junction, and a plurality of legs extending downwardly from said disc and engageable with the walls of said junction to maintain said disc substantially horizontal.

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