Nov. 1, 1966 H. B. LINNEHAN 3,281,864

PORTABLE BATHING APPLIANCE FOR THERAPEUTIC USE

Filed July 29, 1963

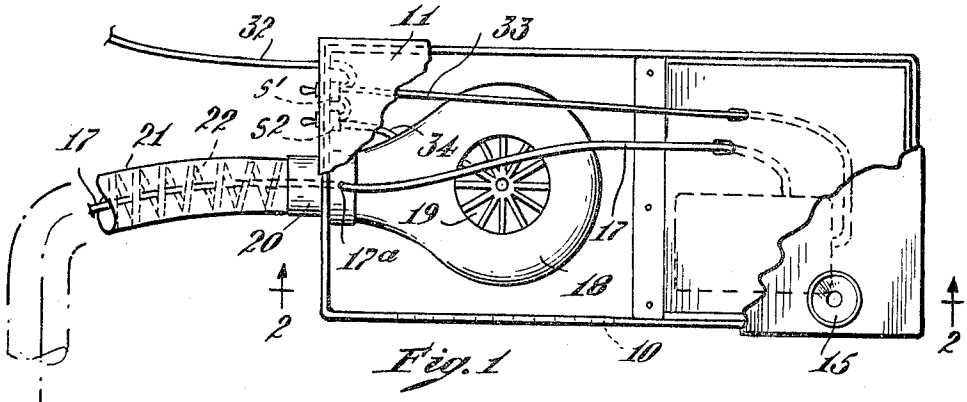


Fig. 1

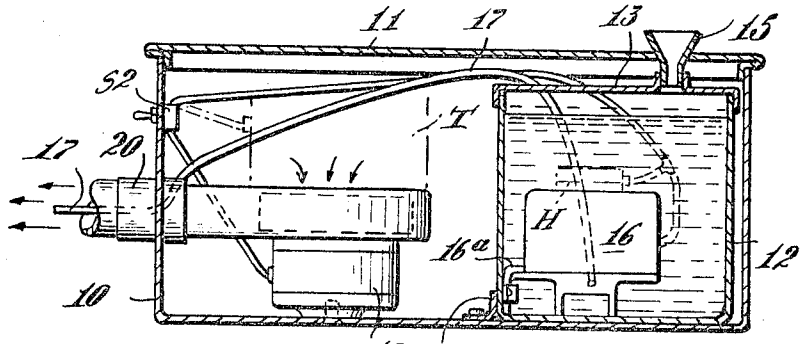


Fig. 2

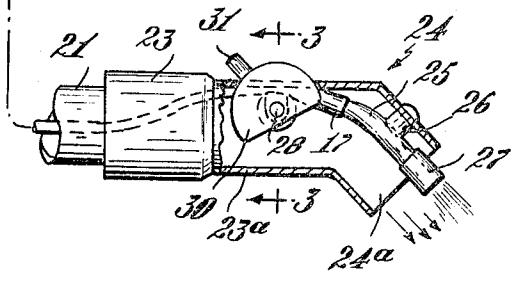


Fig. 1a

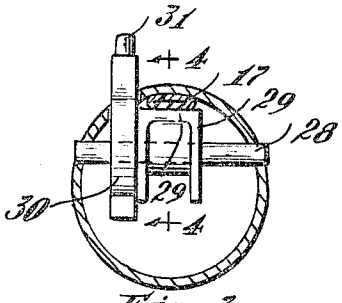


Fig. 3

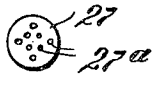


Fig. 5

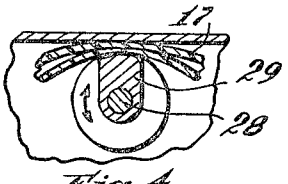


Fig. 4

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United States Patent Office

3,281,864

Patented Nov. 1, 1966

3,281,864
PORTABLE BATHING APPLIANCE FOR THERAPEUTIC USE

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Filed July 29, 1963, Ser. No. 298,361
5 Claims. (Cl. 4—161)

This invention pertains to bathing apparatus for post-operative or post-natal use, more particularly to a portable device comprising means for delivering a forcible spray of liquid, for example pure water or water containing some detergent, medicinal or antiseptic substance for cleansing a patient's skin, having in combination therewith means for drying surfaces which have been cleansed, all without subjecting the patient's skin to the friction attendant upon the employment of absorbent swabs or the like for cleansing and drying.

Present day surgical and obstetrical practice demands that the patient's skin at all involved areas be thoroughly cleaned and treated with an antiseptic to avoid infection. The utmost care in this respect is practiced in post-natal cases, in particular where surgery has been involved, but this cleansing treatment has customarily been carried out by swabbing the patient's skin with absorbent material dipped in water or antiseptic solution. This is a troublesome procedure since it usually involves the use of an open container for the liquid; the inevitable dripping of water in transferring it from the container to the patient; the frictional scrubbing of the patient for the removal of clotted blood or other accumulated foreign matter and, after the washing operation, the skin must be dried which is usually accomplished by the use of absorbent pads which must be completely sterile.

The present invention has for an object the provision of means whereby such cleansing and drying may be performed much more easily, quickly and with less discomfort to the patient than when carried out in the customary manner. A further object is to provide a simple lightweight device by means of which the cleansing and drying operations are simplified and the nurse or attendant relieved of much of the labor involved in the performance of this duty as heretofore done. A further object is to provide a portable device easily movable from place-to-place and comprising power-driven means for applying the cleansing liquid and for delivering a current of warm air for drying the cleansed surfaces.

For the attainment of the above object, the present invention provides a portable case, for instance of sheet metal or plastic and of a size and weight such that it may readily be picked up and moved about with one hand. Within this case there is a reservoir of a capacity to hold cleansing liquid sufficient for at least one treatment. A power-driven pump is arranged in this reservoir. Within the case there is also arranged a power-driven fan and from the discharge of the fan there extends a flexible air tube of substantial diameter and which, for example, may be of the type commonly employed in a vacuum container. A nozzle device is attached to the free end of this air tube. From the discharge of the pump in the reservoir a tube of smaller diameter extends through the air tube to the nozzle device where the tube for the liquid terminates in a tip designed to deliver the water in the form of a spray. A manually-actuatable valve in the nozzle device is operative to close the water tube, when desired, so that only air is delivered from the nozzle. However, water may be discharged as a forcible spray together with air.

It is contemplated that heating means may be combined with the fan so that the air discharged will be warm and likewise, if desired, heating means may be installed in the water reservoir so as to warm the water to a predetermined temperature.

In the accompanying drawings:

FIG. 1 is a more-or-less diagrammatic plan view of the device of the present invention, the cover of the case being broken away to show some of the interior parts, and the air tube leading to the nozzle device is broken away;

FIG. 1*a* is a fragmentary view showing the free end of the air tube with the nozzle device partly in diametrical section;

FIG. 2 is a vertical section substantially on the line 2—2 of FIG. 1, but with the air and water tubes broken off;

FIG. 3 is a transverse section through the nozzle device, substantially on the line 3—3 of FIG. 1*a*;

FIG. 4 is a fragmentary section on the line 4—4 of FIG. 3; and

FIG. 5 is an end view of the tip of the water tube.

Referring to the drawings, the numeral **10** designates a case, here shown as substantially rectangular, having a flat bottom and vertical side and end walls and which may, for example, be of sheet material, or of unitary construction molded, for example, from plastic or glass. As illustrated, this case has a removable top member **11**. Within one end of this case there is arranged a reservoir **12**, for example of plastic, stainless steel or porcelain, having a removable cover **13**. The reservoir is desirably held removably in the desired position within the case by a transversely extending flange or rib **14** fixed to the bottom of the case. While this reservoir **12** is here shown as an independent part seated within the case proper, and easily removed for cleaning, it is contemplated that if the case were made of molded plastic, the reservoir **12** might be formed integral with the case itself.

Within the reservoir **12** there is arranged a power-driven pump **16** of any suitable kind; for example it may be of a commercial type which is designed for the purpose of circulating water in aquariums. This pump is supported above the bottom of the reservoir **12** so that its inlet is immediately above the bottom of the reservoir in order that the pump may remove substantially all of the liquid, in this way making the total quantity of liquid within the reservoir available for a given treatment. As shown in FIG. 2, the pump is held in place within the reservoir by means of an angle member **16***a* secured to the wall of the reservoir. As illustrated in FIGS. 1 and 2 and for convenience in filling the reservoir, a funnel **15** is provided which extends down through an opening in the top member **11** of the case and whose smaller end is fitted within an opening in the cover **13** of the reservoir.

A flexible discharge tube **17** leads from the delivery of the pump **16**. A power driven fan **18** is also arranged within the case **10**. This fan may be of any suitable type, although a fan of the kind commonly used in hair dryers has been found useful for the desired purpose. This fan has an inlet **19** (FIG. 1) and its outlet is secured, leak tight, in a nipple **20**, for example of rubber, which extends outwardly through an opening in the end wall of the case **10** with a tight fit. To this nipple **20** there is secured one end of a flexible air tube **21** of substantial diameter; for example it may be approximately 1½ inches in diameter and which, in order to prevent its accidental collapse during use, is desirably of the kind customarily employed in vacuum cleaners, the wall of the tube proper being of a flexible plastic and being kept in extended condition by an internal helical wire **22**. The free end of this tube **21** is connected, as shown in FIG. 1*a* to a short sleeve **23**, for example of plastic or rubber, and to which there is secured one end of the shank portion **23***a* of a nozzle device

24, for example of stainless steel, plastic or other material not subject to corrosion.

From its connection with the discharge of the pump **16**, the liquid delivery tube **17**, which is relatively small as compared with the air tube **21**, enters the nipple device **20** at a point **17***a* within the case and extends throughout the length of the flexible air tube **21** and through the sleeve **23** into the nozzle **24**, where it is connected to a metal spray head **25** having a bracket portion **26** by means of which it is secured within the discharge end of the nozzle device **24**. This spray head terminates in a tip **27** provided with a plurality of discharge ports **27***a* (FIG. 5). As here shown (FIG. 1*a*), the nozzle device **24** is angularly contoured so that, when the parts **23** and **23***a* are gripped within the user's hand, the delivery orifice **24***a* of the nozzle device may be directed downwardly, such arrangement being convenient for the operator in using the appliance. By housing the delivery pipe from the pump within the air tube, the handling of the apparatus, in use, is much simplified.

A shaft **28** extends transversely across the shank portion **23***a* of the nozzle device, turning in openings in the wall of said shank portion and to this shaft **28** there is fixed a cam device **29** (FIGS. 3 and 4), between which and the inner surface of the shank portion **23***a* of the nozzle device the tube **17** passes on its way to the spray head **25**. To the same shaft **28** there is fixed a guide member **30**, here shown as a flat plate constituting a segment of a circle, which is disposed in an elongate slot in the wall of the shank portion **23***a* of the nozzle device. A radial actuating handle member **31** projects from the edge of this guide member **30**.

The parts just described, including the cam member **29** with its guide **30** and the actuating handle **31**, cooperate with the tube **17** to form a sphincter valve such that when the cam device is in the position shown in FIGS. 3 and 4, the tube **17** is so compressed that liquid cannot pass through it so as to be discharged from the tip **27**. However, by turning the member **30** in a clockwise direction, as viewed in FIG. 1*a*, the cam member **29** is moved out of operative relation to the tube **17** thus permitting the tube to expand to its normal size and permitting the liquid to discharge as a spray through the ports **27***a* at the end of the tip member **27**.

Two switches S^1 and S^2 are secured to the wall of the case **10** with their actuating handles exposed at the exterior of the case and these switches are so connected to a supply conductor **32** and to branch conductors **33** and **34** leading to the pump motor and the fan motor respectively, that either pump or fan or both may be set into into operation by proper manipulation of the switches.

If desired, as indicated diagrammatically in FIG. 2, a conventional heating unit H may be connected in parallel into the circuit of the pump motor and likewise a heater T, for example, such as is customarily employed in a hair-drying device, may be connected in parallel into the circuit of the fan motor. By this means the water in the reservoir **12** may be heated to a desired temperature and likewise the air, delivered by the fan, may be heated.

In the use of this apparatus, the operator may, for example, after having filled the reservoir **12** with the desired liquid, whether water alone or water containing some detergent or antiseptic material, may first close the valve at the nozzle device but actuate the switch which supplies current to the pump and allow the pump to run idly while the water in the reservoir is being heated. However, it is obvious that water heated to the desired temperature may be placed in the receptacle at the start of the operation. Assuming that water of the desired temperature is within the reservoir **12** and that the pump motor is running, the operator then opens the valve in the nozzle device and a spray of liquid is forcibly discharged through the ports **27***a* and by moving the nozzle device about over the area to be cleansed, the force of the spray is sufficient to dislodge blood clots, body secretions or other foreign matter from the surface of the skin. The liquid which drains away may be received in any convenient receptacle, for example a bed pan or the like. This operation may continue until the surfaces are thoroughly cleansed, it being noted that the cleansing operation is carried out without the use of absorbent swabs and without requiring any frictional pressure or scrubbing action upon the patient's skin.

Having thus cleansed foreign material from the skin, the motor of the pump may be stopped and the fan motor started and assuming that the air current which is delivered is warm, the strong current of air delivered from the nozzle device will rapidly dry the surfaces involved without recourse to the employment of absorbent pads or the like or any wiping or frictional contact of solid material with the patient's skin.

Thus, by the present apparatus, it is possible to bathe the patient antiseptically in a much shorter time and with much less effort on the part of the operator and with far greater comfort to the patient and without the danger of slopping liquid about the surroundings which is a common concomitant to prior methods of bathing the patient.

While one desirable embodiment of the invention has herein been illustrated and described by way of example, it is to be understood that the invention is broadly inclusive of any and all modifications falling within the scope of the appended claims.

I claim:

1. A bathing device for surgical and obstetrical use, said device comprising a portable case having therein a reservoir for liquid and a power-driven pump within said reservoir, a power-driven fan within the case, a flexible air tube extending outwardly from the fan through an opening in the wall of the case, a nozzle device secured to the free end of said air tube, the pump within the reservoir for liquid having a delivery tube which enters the air tube and extends within the latter to the nozzle device where it terminates in a tip having a plurality of delivery ports, and a valve within the nozzle device by means of which the delivery of liquid may be controlled.

2. A bathing device for post-operative or post-natal use, comprising a portable case having therein a reservoir for liquid, a power-driven pump in the reservoir, a power-driven fan within the case, a nozzle device and a flexible air tube leading from the discharge of the fan to the nozzle device, a flexible tube extending from the power-driven pump through the air tube to the nozzle device, valve means within the nozzle device for controlling the delivery of liquid therefrom, and means whereby either the pump or the fan may be actuated independently of the other.

3. A bathing device for hospital use in the antiseptic cleansing of large areas of skin surface, said device comprising a thin walled case of corrosion-resistant material, a leak-tight reservoir for liquid within the case, a power-driven pump within the reservoir, a power-driven fan within the case, a flexible non-collapsible tube of relatively large diameter extending from the discharge of the fan outwardly, leak-tight through an opening in the wall of the case, a nozzle device secured to the free end of the air tube, a flexible tube of relatively smaller diameter extending from the pump into the interior of said air tube and through the latter to the nozzle device, a spray head attached to the free end of the smaller tube, a valve within the nozzle device for controlling the discharge of liquid from the nozzle device, independent switches for controlling the pump and fan motors, heating means within the reservoir for warming the liquid therein, heating means within the case for warming the air discharged by the fan, and a removable top for the case, said top having therein a funnel for use in filling the reservoir.

4. The combination according to claim **3**, wherein the valve for controlling the discharge of liquid from the nozzle device is a sphincter valve operative so to compress the tube leading from the pump as to prevent the flow of liquid therethrough.

5. A bathing device for hospital use in the antiseptic cleansing of large areas of skin surface, said device comprising a light-weight case of corrosion-resistant material, a reservoir for liquid within the case and a power-driven pump within the case, and in combination therewith a power-driven fan, a nozzle device, and flexible tubing leading from the pump and from the fan, respectively, to the nozzle device, and means whereby either liquid or air may be delivered from the nozzle device alternatively or at the same time according to the will of the user.

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