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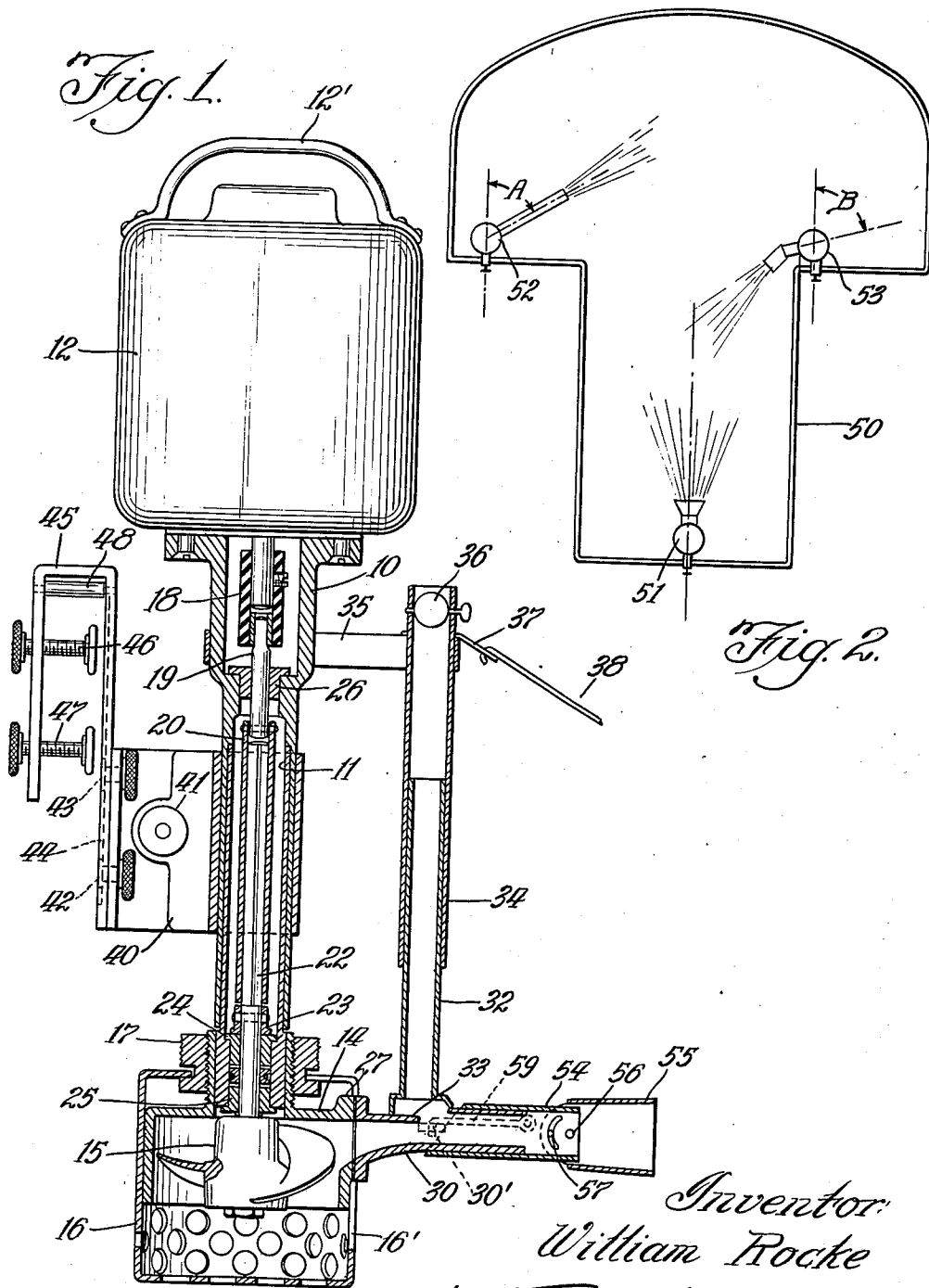
W. ROCKE

2,272,585

ADJUSTABLE HYDROTHERAPY NOZZLE

Filed Feb. 13, 1941

2 Sheets-Sheet 1



Inventor:
William Rocke
By Tefft + Tefft.
Attys.

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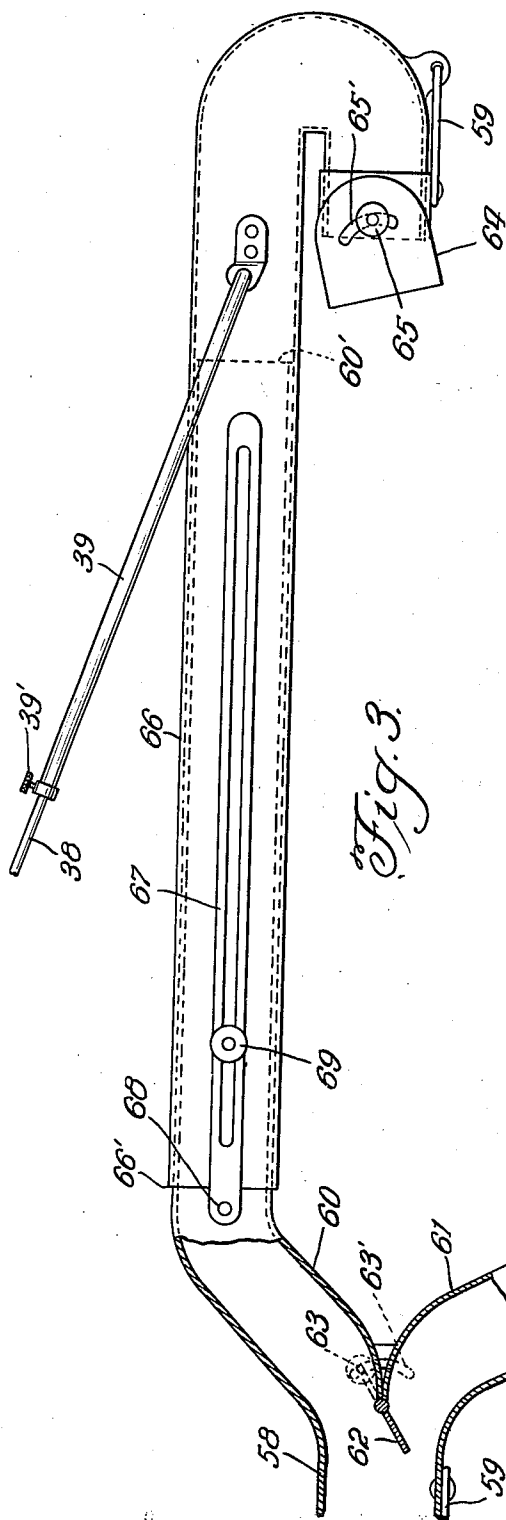
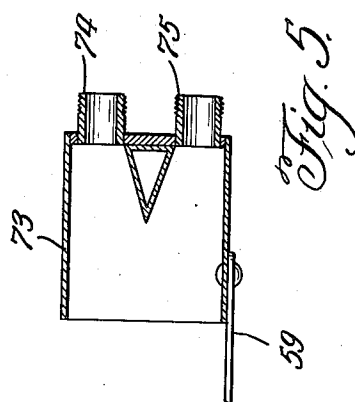
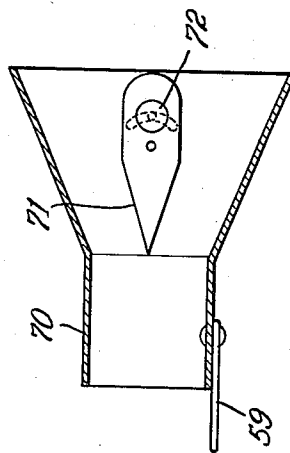
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Inventor:
William Rocke
By: Tiff + Tiff.
Attys.

UNITED STATES PATENT OFFICE

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ADJUSTABLE HYDROTHERAPY NOZZLE

William Rocke, South Bend, Ind.

Application February 13, 1941, Serial No. 378,839

3 Claims. (Cl. 128—66)

This invention relates to hydrotherapy apparatus and particularly to adjustable nozzles for circulator pumps. This is a divisional application of my copending application, Serial No. 392,646, filed May 9, 1941 for Hydrotherapy circulator. Although hydrotherapy has been practiced for many years, a comparatively recent development in the art has indicated the need for circulator pump apparatus to provide vibratory massage effects to produce improved results over the older methods. This new hydrotherapy technique requires a wide variation in the application of water currents to produce the desired massage effects. Hydrotherapy is often resorted to when manual massage is too severe and painful and this requires the most gentle application of water currents carrying air bubbles to produce the desired gentle vibratory effects. Other conditions require that a patient be outstretched and immersed in a large tank and be suspended in the water by powerful large volume circulator currents.

The water is often treated with oils and medicines and into the stream of these solutions air is injected in variable amounts to produce the desired effects. The tanks used in hydrotherapy vary in size, depth and shape to accommodate treatment of any part of the body or the entire outstretched body. These wide variations in tanks and treatments require a circulator pump adjustable in almost all particulars of mounting and discharge flow characteristics.

It will be appreciated that in such a wide variety of treatments the circulator nozzle must be extremely flexible or adjustable to control or direct the water currents as may be desired.

The principal object of this invention is to provide an interchangeable sectional nozzle for a hydrotherapy circulator, which may be adjustably mounted on the circulator discharge to direct water currents in a wide variety of hydrotherapy treatments.

Other objects and benefits will be disclosed in the following descriptions and drawings in which:

Fig. 1 is an elevational cross section view of my circulator with support clamp bracket attached;

Fig. 2 is a diagrammatic plan view of a full immersion tank showing three circulators attached in various positions;

Fig. 3 is a broken plan view of my adjustable circulator nozzle employing three nozzle sections, as will later be explained.

Fig. 4 is a plan view of a wide discharge circulator nozzle section; and

Fig. 5 is a sectional plan view of a circulator nozzle with hose attachment fittings, as will later be explained.

Now referring to Fig. 1, I designate my outside vertical support tube by the numeral 10 and the

inside telescoping support tube by the numeral 11. A motor 12 is mounted on the top of the tube 10, as shown, and a centrifugal pump housing 14 is mounted on the bottom of the inner telescoping tube 11. Mounted within the pump housing is an impeller 15 and exterior of the housing 14 is an adjustable perforated member 16. This perforated member 16 is supported in a knurled adjustment screw 17 mounted on the housing 14 and when the knurled screw is rotated the perforated adjustment member will be moved vertically to increase or decrease the inlet opening to the centrifugal pump housing 14, the housing 16 being prevented from rotating by a saddle opening 16' around the pump discharge 30.

The motor 12 drives the impeller 15 by means of the flexible coupling 18, the stub shaft 19 and the square drive tube 20 attached to the shaft 19 by the drive pin 21, the impeller 15 being driven by square tube 20 through the square drive shaft 22 held in position by the thrust collar 23.

It will be appreciated that by this structure I provide adjustable telescoping drive means between the motor 12 and the impeller 15. The shafts in this driving arrangement are supported by conventional bearings 24, 25 and 26, as shown.

An outlet to the centrifugal pump is provided by a single thin outlet flange 27 provided with tapped flange holes (not shown) for mounting the pump discharge member 30. On top of the discharge member 30 there is a stepped opening on which is mounted an air inlet injector tube 32. The injector feature of this mounting being provided by the lip 33 under the opening of the tube 32, as clearly shown in Fig. 1. Telescopically mounted over the tube 32 is another tube 34 supported by a clamp bracket 35 from the tube 10. In the top of this air inlet tube 34 is an adjustable butterfly valve 36, whose purpose will be described in more detail later. Integral with the bracket 35 is an angular ear 37 to support a brace rod 38 for my adjustable nozzles, as will later be explained.

Around the vertical tube 10 is a clamp bracket 40 securely clamped to the tube 10 by means of a knurled screw 41. I provided slit openings in the tube 10 (not shown) which permits the outside vertical tube 10 to be collapsed and clamped on the inner tube 11. By this arrangement it will be understood that I provide means whereby the entire circulator pump assembly may be rotated in the clamp bracket or adjusted vertically to provide a greater distance between the pump and the motor at the same time the air injector tubes 32 and 34 will be similarly adjusted. The clamp bracket 40 is attached to a U-clamp 45 by means of slidable T bolts 42 and 43 in a vertical slot 44 of the bracket 45. This arrangement provides means whereby the clamp

40 may be adjusted vertically on the U-clamp 45, as will be readily appreciated by a study of the drawings. The U-bracket 45 is supported on the rim of a tank by rollers 48 trunnioned in the dual legs. It may be clamped securely to the tank by means of the thumb screws 46 and 47 or when these thumb screws are loosened an operator may roll the entire circulator assembly to various positions on the tank by means of the rollers 48. A handle 12' on the motor 12 is provided to facilitate this operation.

Now referring to Fig. 2 I show diagrammatically a large immersion tank 50 wherein the patient may be treated in outstretched position. I show diagrammatically circulator pumps in three positions 51, 52 and 53. At 51 the circulator pump is straight with the bracket 45, and when the short Y-discharge nozzle is directing a wide thin outlet current directly down the center line of the tank 50. In the position 52 the circulator pump has been rotated by an angle A and through a longer discharge nozzle is directed a stream at an angle of approximately 45° to the center line 50. In the position 53 the circulator has been turned at an angle B and with another angular nozzle is directed a reverse current stream of an angle of about 30° to the center line of the tank.

In the foregoing illustration I have described various adjustments of my circulator and nozzle to provide a wide variety of hydrotherapy treatments as will be appreciated by the structures described.

Now referring to Fig. 3, I show a four-section hydrotherapy nozzle, wherein the inlet section 58 is attached to the circulator outlet 30 by a pivotal clamp 59 hooked into an ear 30' of the outlet member 30, as shown in dotted outline in Fig. 1. Y-branches 60 and 61 extend from the main opening and a deflector valve 62 controlled by a thumb screw 63 in a radial opening 63' provides means to deflect the water stream through either of the branches 60 or 61, as desired. The branch 60 extends longitudinally a considerable distance to the point 60'. Telescoping over the branch 60 is another member 66 which extends to the point 66', as shown. These members are held together by the slotted strap 67 riveted to the branch 60 by the rivet 68 and adjustably held by the knurled thumb screw 69. This long sectional nozzle is adjustably supported by the tube 39 and thumb screw 39' telescopically enclosing the rod 38 supported by the ear 37 from the brace 35, as previously described for Fig. 1. It will be appreciated that by this support structure the long nozzle sections may be securely held in place even when the sections 60 and 66 are longitudinally extended outward a much greater distance than that shown in Fig. 3. On the ends of the branches 61 and 66 I show a longitudinal adjustable nozzle member 64, which may be adjusted and held at any angle by means of the thumb screw 65 in the radial slot 65'. It will, therefore, be appreciated that in Fig. 3 I show a nozzle wherein two streams of water may be directed on the arm or leg of a patient or under any conditions where such hydrotherapy treatments are indicated. It will further be appreciated that the intensity of the streams may be fully controlled by the deflector 62 and thumb screw 63.

Now referring to Fig. 1, I show a vertically pivotal nozzle composed of members 54 and 55, the member 55 being angularly adjustable by means of pivoting around the pivot 56 and held by a thumb screw 57. Thus, I have shown and

described nozzle members which permit either horizontal or vertical angular adjustment.

In Fig. 4 I show a wide stream nozzle attachable to the outlet member 30 and wherein the intensity of the stream may be controlled by the deflector 71 through the knurled screw 72, as will be readily appreciated by consideration of the drawing. Similarly in Fig. 5, I show a member 73 having hose connections 74 and 75 to which may be attached flexible hoses for directing hydrotherapy streams in any desired direction.

I further desire to explain that I provide sizes and proportions of my nozzle sections whereby the greatest interchangeability of the sections is permitted. In fact any of my sections may practically be interchanged with any of the other sections to provide the greatest possible flexibility. It will be appreciated that in a hydrotherapy apparatus and particularly nozzles normally immersed in liquid, no close fitting is required for even a five or ten per cent leak in the parts would effect no practical difference as I provide a pump of very large volume capacity which may be adjusted by the knurled adjustment screw 17 and the perforated adjustment member 16.

It will further be appreciated that in all the structure disclosed that the patient is protected from all moving parts and great care has been exercised to provide a circulator adjustable to fit practically all conditions. The circulator may be adjusted for shallow or deep tanks by the vertical telescoping members as described. It may be rotated at any angle by rotation on a vertical axis, the circulator pump capacity may be adjusted as explained and the volume of air injection may be varied to produce any desired vibratory effects by adjustment of the butterfly valve 36.

Having thus described my invention, I now claim:

1. In a nozzle attachment for a hydrotherapy circulator, a dual branch attachment section, adjustable deflector means to control the flow through the branches so as to proportion the flow of fluid between the two branches, a telescoping longitudinally adjustable section attachable to one of the branch sections, and pivotal discharge sections attachable to both the branch and telescoping sections, whereby dual water currents of variable intensities may be adjustably directed.

2. In a nozzle attachment for a hydrotherapy circulator, a dual branch attachment section, adjustable deflector means to control the flow through the branches so as to proportion the flow of fluid between the two branches, a telescoping longitudinally adjustable section attachable to one of the branch sections, and pivotal discharge sections attachable to both the branch and telescoping sections, said branch, telescoping, and discharge sections being proportioned and arranged to permit interchangeable mounting of the sections.

3. In a nozzle attachment for a hydrotherapy circulator, a dual branch attachment section, a reverse flow longitudinally adjustable telescoping section, means to lock the adjustable section in a plurality of positions, means to support the adjustable section, and adjustable discharge sections attachable to the discharge ends of the branch and telescoping sections, whereby a dual outlet reverse flow nozzle attachment is provided.