United States Patent

Friend

[15] **3,641,996**

[45] **Feb. 15, 1972**

[54] HYDROTHERAPY APPARATUS

[72] Inventor: **Homer C. Friend,** 6502 North 35th Avenue, Phoenix, Ariz. 85107

[22] Filed: **Nov. 14, 1969**

[21] Appl. No.: **876,887**

[52] **U.S. Cl.** **128/66**

[51] **Int. Cl.** **A61h 9/00**

[58] **Field of Search** 128/66, 369; 4/178, 180

[56] **References Cited**

UNITED STATES PATENTS

2,938,517	5/1960	Friend	128/66
802,233	10/1905	O'Donnell	128/66 UX
950,059	2/1910	Sickels	128/66 X
3,297,025	1/1967	Jacuzzi	128/66

FOREIGN PATENTS OR APPLICATIONS

105,590	4/1917	Great Britain	128/66

Primary Examiner—L. W. Trapp

Attorney—Diller, Brown, Ramik & Holt

[57] **ABSTRACT**

A hydrotherapy apparatus including a tub having water inlets spaced around the periphery thereof and adapted to selectively or simultaneously admit water into the tub so as to cause turbulence therein for hydrotherapeutic applications. Water may also be caused to impact upon a given portion of a patient's body under predeterminable conditions of volume and pressure by means of a nozzle the position of which is adjustable relative to the patient's body by means of a support rod which engages the patient's body and fixes the position of the nozzle relative thereto. The support rod includes a ball carried in a socket on one end thereof as well as a pivotable plate which is adapted to engage the patient's body and thus fix the angular position of the nozzle relative thereto.

5 Claims, 5 Drawing Figures

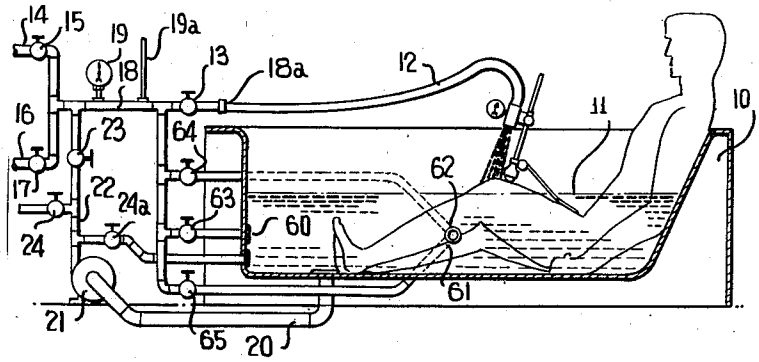


FIG. 1

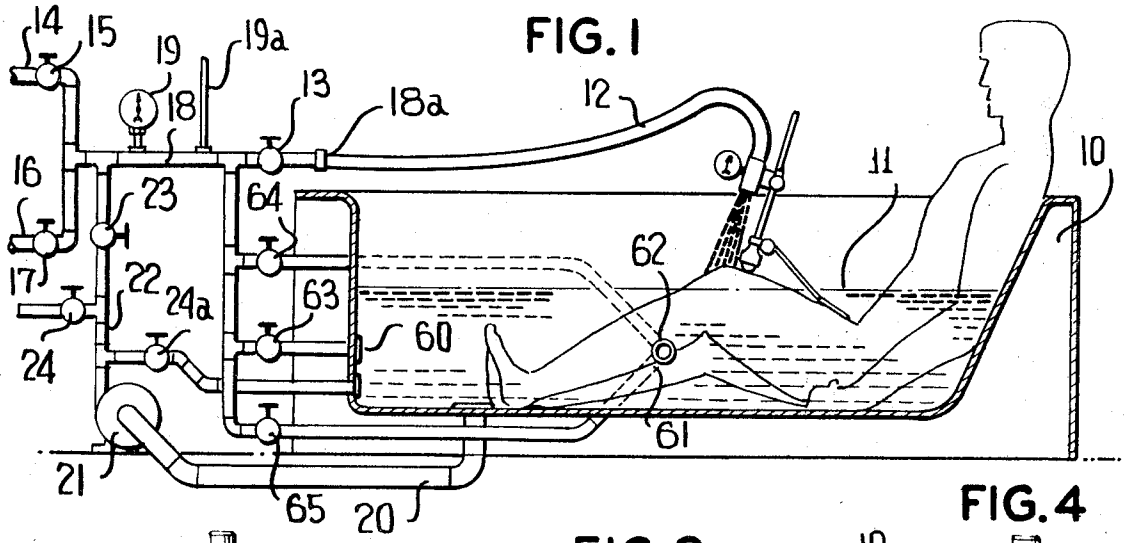


FIG. 4

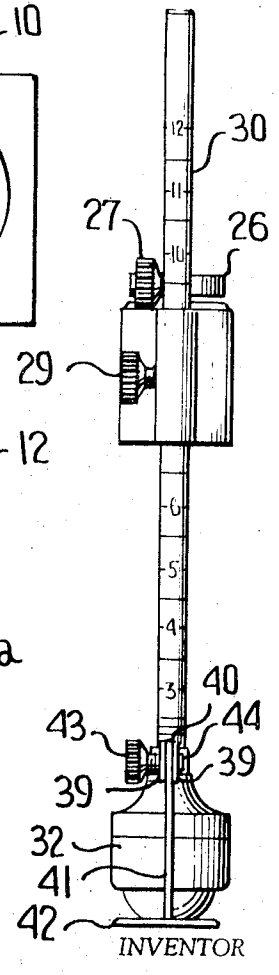


FIG. 3

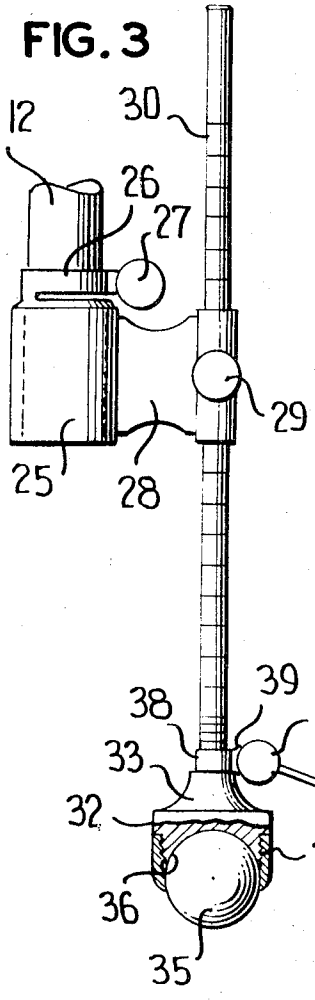


FIG. 2

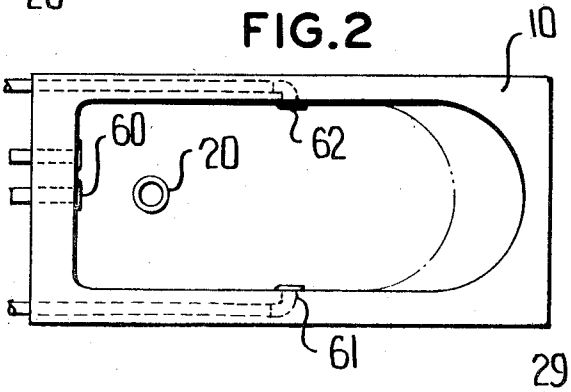
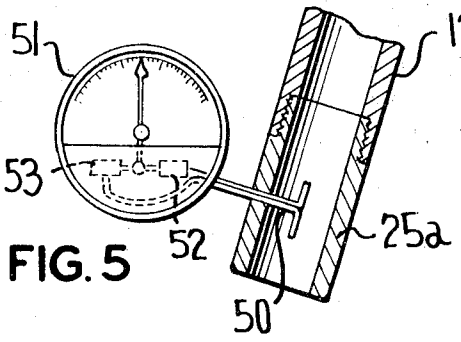


FIG. 5



INVENTOR
HOMER C. FRIEND

BY
Dillon, Brown, Ramik & Holt
ATTORNEYS

HYDROTHERAPY APPARATUS

This invention relates to a hydrotherapeutic apparatus by which a water jet can be caused to impact upon the patient's body under predeterminable conditions of volume and pressure.

Hydrotherapy has been employed with water jets, for massage effects; but with fixed orifices on the tub, or with hand-held hose nozzles, the effect is gaged and determined by visual observation of the effect of the jet impact. What is too much for one patient and can lead to injection of an excessive amount of the liquid into such patient's tissues to the point of causing capillary hemorrhage, may be insufficient for another, on the basis of visual observation: and likewise what is proper at one part of a given patient's body may be improper at another, although the visual appearance is the same.

An object of this invention is the provision of an apparatus by which predetermined effects can be given hydrotherapeutically, with controllable variation as the physician may prescribe.

Another object is the provision of a hydrotherapeutic jet apparatus by which the jet impact may be controlled as to volume and pressure at the point of impact.

With these and other objects in view, as will appear in the course of the following description and claims, an illustrative embodiment of the invention is shown on the accompanying drawings, in which:

FIG. 1 is an upright section through a hydrotherapy tub, with associated conduits and with a jet-controlling arrangement;

FIG. 2 is a top view of the tub;

FIG. 3 is a side elevation of a jet-controlling device, with parts broken away for clearness;

FIG. 4 is an edge elevation of the same;

FIG. 5 is a sectional view of a modified part of a jet-controlling device.

The therapeutic apparatus comprises a tub **10** into which water can be brought to a level such as **11** for covering the body part to be treated. The water jet for the treatment is delivered from the end of a hose **12** under control of a valve **13**. This may be from the city mains, coming directly through the cold water pipe **14** with its valve **15** and indirectly through a water heater and by the hot water pipe **16** with its valve **17**. By adjustment of the valves **15**, **17**, the temperature of the water can be controlled at its delivery to the flow pipe **18** and valve **13** and thence into the hose **12**. The pressure in the flow pipe **18** is indicated by a gauge **19** and the water temperature by a thermometer **19***a*. Also water can be recirculated from the tub **10** by the return pipe **20** and a motor-driven pump **21** to pipe **22** and thence through valve **23** to the flow pipe **18**. When a steady water level **11** is to be maintained, with recirculation, and with makeup hot water, the pump **21** is operated so its output pressure delivers the recirculated liquid to the flow pipe **18**, and the valve **17** may be partly open to maintain water temperature, with valve **15** closed. Valve **24** on a branch of pipe **22** is partly opened to discharge an amount of water equivalent to that entering through valve **17**. For controlling the effect of the pump **21**, without wastage of water the pipe **22** may have a branch with a valve **24***a* which leads back into the tub **10**.

The amount and depth of the treatment by the jet of water from the end of the hose **12** is controlled by the valve **13** and the position of the hose end. To determine the position of the hose end, the hose is fixed in a sleeve **25** by a clamp **26** having a screw **27** for holding the hose in place. The sleeve **25** is formed with a bracket **28** having a passage for the gauge rod **30**, upon which it may be fixed by the screw **29**. The rod **30** is graduated, with indicia indicating distances, for example by inches and half-inches. At the body end of the rod **30**, it has an enlargement **32** comprised of an upper part **33** having an external screw thread, and a lower sleeve **34**. A ball **35** is held by the inwardly projecting lower end of sleeve **34** and fits in a cavity **36** of the upper part **33**; so that the ball can turn but has insignificant freedom of movement in the direction of rod **30**.

A sleeve **38** fits around the body end of the rod **30**, resting against the upper face of the enlargement **32**, and has the radially projecting ears **39**, between which is fitted the portion **40** of an arm **41** which has a shoe **42** at its free end. A screw **43** passes through the ears **39** and portion **40**, and engages a nut **44** which may be secured to one of the ears: when the screw is tightened, the sleeve **38** is held against movement relative to the rod **30**, and the arm **41** is held against pivotal movement relative to the axis of the screw **43**.

A preliminary setting is effected by holding the rod **30** at right angles to a flat surface, with the ball **35** in contact with the surface, adjusting the shoe **42** until it also is in contact, and tightening the screw **43**. Thereafter, the nozzle end will be at a distance from the line or plane determined by the ball **35** and shoe **42** which is indicated by the prevailing position of the bracket **28** on the rod **30**.

A therapeutic treatment can be conducted by placing the patient's body in the tub of water, and adjusting the bracket **28** to a selected position on the rod **30**. The ball **35** is then brought against the patient near the point at which treatment is to start, with the shoe **42** resting at another part of the body. The gauge **19** is then observed, to ascertain the water pressure existent with the existing position of valves **15**, **17**, **23** and **24**. The hose **12** is illustratively connected to the pipe **18** at connection **18***a*. The valve **13** is then opened and water flows through the hose **12**, and the gauge **19** observed: if the pressure drops below that desired for the treatment, the valves **15**, **17**, **23**, and **24** are adjusted to attain the desired pressure.

The hose end may be above or below water level. For deep therapy, it is preferred to have the end below water, so the treatment occurs by water alone and without air bubbles therein. The jet, by impacting upon the patient's skin, causes a depression thereof, with a massage effect. With swelling or edema not due to externally induced poison effects, this massage may be continued by moving the ball **35** relatively toward the patient's thorax, wherewith the free liquid content of the edemous tissues is urged away from the impact region toward the parts of the patient's body where it can be separated and excreted by natural processes.

A closer control can be exercised as shown in FIG. 5, where the end of the hose **12** is provided by a metal sleeve **25***a* formed with the bracket **28** as before. Pitot tubes **50** extend into the sleeve **25***a* and have their ends turned as usual upstreamward and downstreamward relative to the water current. These tubes lead to a gauge **51** illustratively having cylinders **52**, **53** with pistons connected to the gauge indicator needle **54**, so this needle shows the pressure difference at the ends of the Pitot tubes. Since the cross-sectional area of the sleeve **25***a* is fixed, the gauge **51** can be calibrated to indicate the volume of water moving through the sleeve accurately, noting that the pressure can be closely controlled by valve **13** and gauge **19**.

The apparatus can be provided with equipment for turbulent water therapy. Thus, the tub **10** may be provided with water inlets **60**, **61** and **62** in the sides thereof. This inlet **60** may have a diameter of 1¼ inches, and be located 4 inches from the floor of the tub and provided with a connection for the hose **12**. Inlets **61** and **62** can be three-fourths inch in diameter, located 4 inches from the floor of the tub. The streams from inlets **61**, **62** are of value in the water massage for reducing fat and for general treatment of crippling ailments. Individual control valves **63**, **64** and **65** are shown; noting that the valve **63** is employed in lieu of valve **13** when the hose is connected to inlet **60**.

The apparatus is advantageously used in treating arthritis, bursitis, prostatitis, polio, spastic and other conditions by a comfortable massage. In many cases significant relief can be produced by use of 2 to 5 pounds pressure for 2 to 5 minutes with the hose nozzle end at 6 to 12 inches from the affected part.

An illustrative hydrotherapy apparatus may have a tub for holding 125 to 139 gallons of water. Such a tub may be 7 feet long by 3 feet wide and 30 inches deep. The recirculating

pump can be operated to deliver up to 120 gallons per minute. The water heating system can hold the tub contents and the water jet at 100° to 102° F. The hose end can have an internal diameter of 1 inch and the adjustments made for a delivery of about 80 gallons per minute, so that a pressure of about 10 pounds per square inch is exerted at impact for the usual patient with the hose end spaced 7 inches from the body. For this, the supply pipes **14, 16, 18, 22** should be at least 1¼ inches in diameter, and the return pipe **20** at least 2 inches: the return through valve **24***a* may be as small as one-fourth inch in diameter.

The illustrated form is not restrictive, and the invention may be practiced in other ways within the scope of the appended claims.

I claim:

1. In a hydrotherapeutic apparatus of the type having nozzle means for directing a fluid jet to a given portion of a patient's body, said hydrotherapeutic apparatus comprising means for maintaining nozzle means a predetermined distance from a given portion of the patient's body, said maintaining means including a support rod for fixing the position of said nozzle means relative to the given portion of the patient's body whereby the fluid jet may be caused to impact upon the patient's body under predeterminable conditions of volume and pressure, said support rod including means for engaging the patient's body to fix its position relative thereto, said engaging means being a ball carried by a socket on an end of said support rod.

2. Apparatus as defined in claim **1** including means for fixing the angular position of said support rod relative to the given portion of the patient's body.

3. Apparatus as defined in claim **2** wherein said angular positioning means includes an arm pivotally connected to said support rod and having a shoe portion at an end thereof for engaging the patient's body.

4. In a hydrotherapeutic apparatus of the type having nozzle means for directing a fluid jet to a given portion of a patient's body, said hydrotherapeutic apparatus comprising means for maintaining said nozzle means a predetermined distance from a given portion of the patient's body, said maintaining means including a support rod means for fixing the position of said nozzle means relative to the given portion of the patient's body whereby the fluid jet may be caused to impact upon the patient's body under predeterminable conditions of volume and pressure, and said support rod means including means for engaging the patient's body to fix the position of said nozzle means relative thereto, said means for engaging the patient's body comprising two-point engagement means including one end of said support rod means and an arm having a shoe at its free end, means for pivotally connecting said arm to said support rod means for pivotal movement in the plane of said support rod means, and means for fixing the angular relationship of said arm and said support rod means.

5. A hydrotherapeutic apparatus for treating a given portion of a patient's body, said hydrotherapeutic apparatus comprising a tub, means for delivering fluid under pressure to said tub, means for regulating the volume and pressure of fluid delivered, means for evacuating fluid from said tub, nozzle means at a terminal end of said delivering means for directing a fluid jet to a given portion of a patient's body, and means for maintaining said nozzle means a predetermined distance from the given portion of the patient's body whereby the fluid jet may be caused to impact upon the patient's body under predeterminable conditions of volume and pressure, said maintaining means including a support rod for fixing the position of said nozzle means relative to the given portion of the patient's body, said support rod including means for engaging the patient's body to fix its position relative thereto, said engaging means comprising a ball carried by a socket on an end of said support rod.

* * * * *