United States Patent

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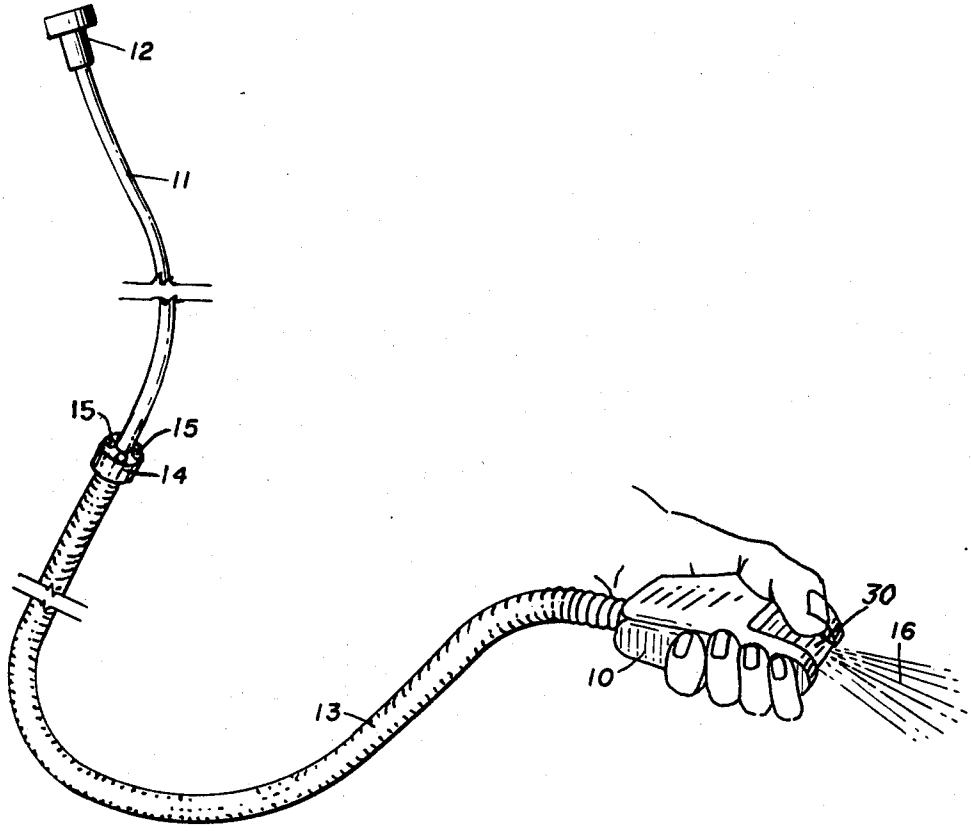
[54] **HYDRO-MASSAGE UNIT**
4 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **128/66**
[51] **Int. Cl.** **A61h 9/00**
[50] **Field of Search** 128/66; 4/180

[56] **References Cited**
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ABSTRACT: A flexible water conduit, attachable at its intake extremity to a pressure source. A flexible air conduit axially encloses said water conduit for a portion of the length of the latter, both conduits terminating at their discharge extremities in a hand-held nozzle housing in which air is drawn through said air conduit, by a jet of water discharging from said water conduit, to produce a high velocity vibrating stream of intermixed air and water. The housing is provided with a flap valve which can be manually forced into said stream to control the discharge characteristics of said stream.



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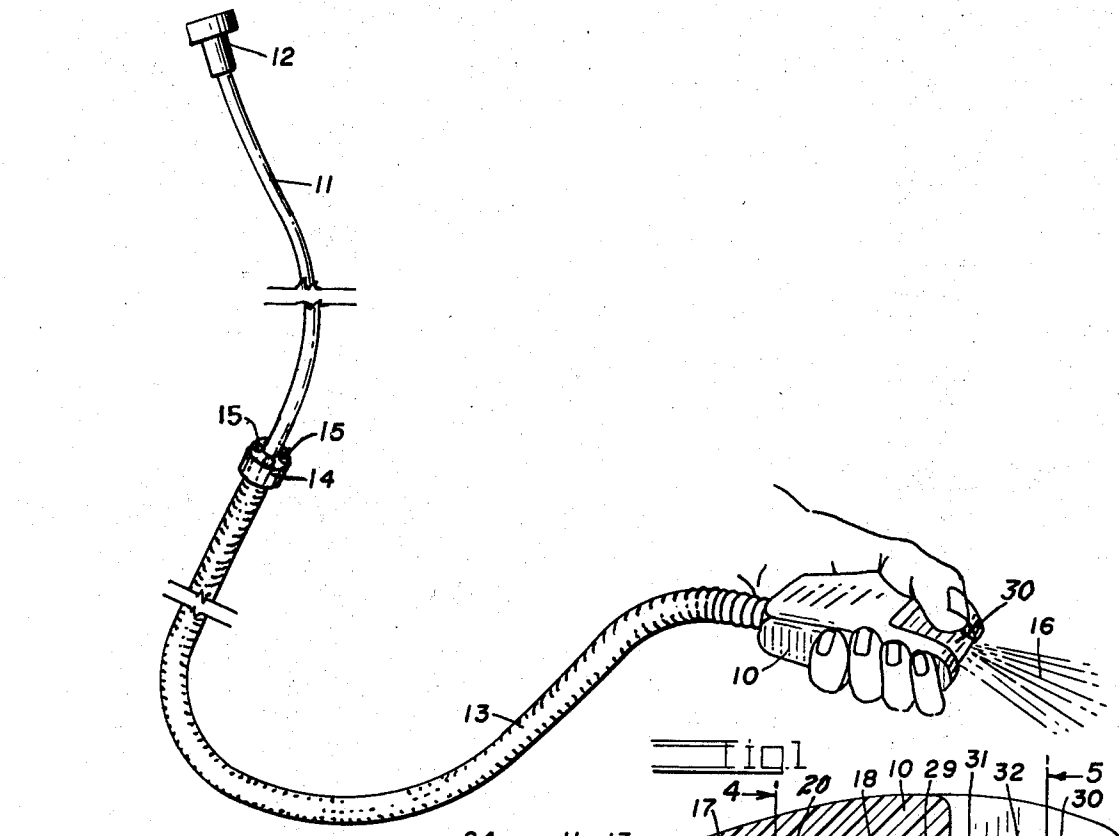


Fig. 1

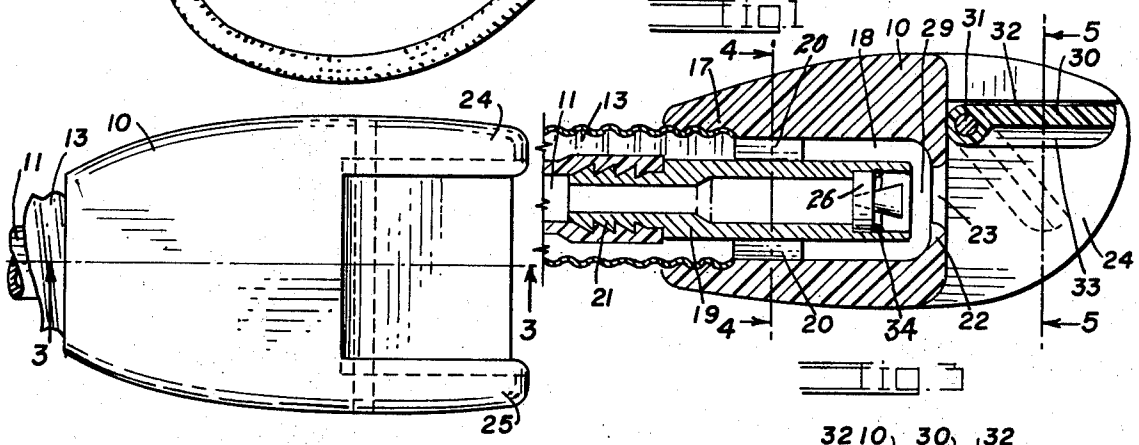


Fig. 3

Fig. 2

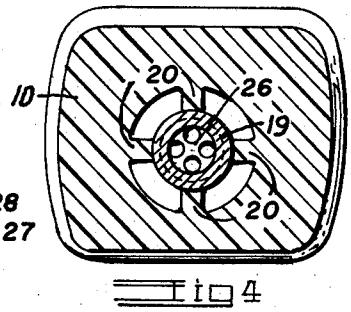


Fig. 4

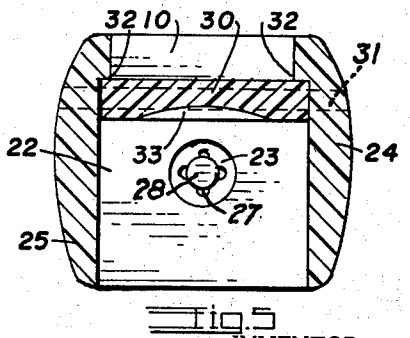


Fig. 5

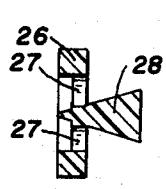


Fig. 7

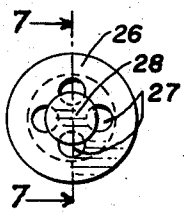


Fig. 6

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HYDRO-MASSAGE UNIT

This invention relates to hydro-therapy, and more particularly to a portable unit for applying a high-velocity stream of water bubbles to the human body for hydraulically massaging the tissues and muscles for therapeutic purposes.

The principal object of the present invention is to provide a unit of the above type which can be quickly and easily applied to household plumbing fixtures for use in a patient's home so as to reduce or eliminate the necessity for attendance to the physiotherapy departments of conventional hospitals.

A further object is to provide a portable hydro-massage jet housing which can be conveniently held in the palm of the hand to direct and control a powerful aerated water stream against the body of a patient seated in a bath tub.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is made to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

FIG. 1 is a partially broken-away, perspective view of the hydro-massage unit of this invention as it would appear in use;

FIG. 2 is a substantially full size, top, plan view of a jet housing employed on the discharge extremity of the unit of FIG. 1;

FIG. 3 is a similarly enlarged, longitudinal, sectional view, taken on the line 3–3, FIG. 2;

FIGS. 4 and 5 are cross-sectional views through the jet housing, taken on the lines 4–4 and 5–5, respectively, FIG. 3;

FIG. 6 is an enlarged, detail, front view of a jet disc, to be later described, contained in the jet housing of FIG. 3; and

FIG. 7 is a diametric sectional view of the jet disc, taken on the line 7–7, FIG. 6.

The portable, hydro-massage unit of this invention comprises a molded, plastic, jet housing 10 from the rear extremity of which a relatively long, flexible polyvinyl water tube 11 extends to a conventional, faucet coupling 12 of any suitable type which can be conveniently slipped over or attached to the shower outlet of a conventional household bath tub. The lower portion of the water tube 11 is enclosed in, and surrounded by, a relatively short, flexible, corrugated, polyvinyl air tube 13, of larger diameter than the water tube 11, which also extends to the housing 10. The air tube 13 is of sufficient length to extend well above the maximum water line of the bath tub, when the coupling 12 is in place on the shower outlet, so as to prevent entry of water from the tub.

The upper extremity of the air tube 13 may be left open but is preferably closed by a double-diameter coupling sleeve 14 which maintains the extremities of the two tubes 11 and 13 in concentric relation and which is perforated, as indicated at 15, to allow air to freely enter the air tube 13. A high velocity jet stream of intermixed air and water discharges from the forward extremity of the housing 10, as shown at 16 in FIG. 1, the body massaging purposes.

The rear extremity of the housing 10 is provided with an internally-corrugated tube socket 17 into which the corrugated lower extremity of the air tube is interfitted so as to axially align the air tube with an elongated, cylindrical air chamber 18 in the housing 10 which substantially corresponds in diameter to the diameter of the air tube 13. An elongated, preferably metallic, tubular water nozzle 19 of less diameter than the air chamber 18 is concentrically supported therein by means of radial, axially-extending, spaced-apart, supporting fins 20.

The rear extremity of the water nozzle 19 is reduced in diameter and provided with hose-retaining nipple ridges 21 which enter and interlock with the lower extremity of the water hose 11, as shown in FIG. 3.

The forward extremity of the air chamber 18 is closed by an end wall 22 having a jet stream opening 23 positioned in axial alignment with the water nozzle 19. The forward extremity of the water nozzle 19 is spaced from the end wall 22 so as to leave an annular air passage 29 from the air chamber 18 to the jet stream opening 23 about the entire circumference of the latter.

The forward discharge extremity of the water nozzle 19 is counterbored to receive a jet disc 26, shown in detail in FIGS. 6 and 7, preferably formed from molded plastic. The jet disc is provided with an annular series of water jet ports 27 which concentrically surround the pointed extremity of a jet spreading cone 28 which is formed, or otherwise mounted, on the disc 26 so as to project its larger diameter axially forward.

The jet disc is removably secured in place in the counterbore of the water nozzle 19 in any suitable manner, such as by means of a conventional snap ring 34, so that the cone 28 is completely surrounded by the forward extremity of the water nozzle 19, as shown in FIG. 3.

The water discharges from the ports 27 in a plurality of solid high velocity jets which strike the outwardly inclined sides of the cone 28 and are spread into a high velocity cylinder of water which is directed across the annular air discharge passage 29 of the chamber 18, and into the jet stream opening 23 to create a venturi effect to draw air from the air chamber and intermix the air, as minute bubbles, with the water jets discharging from the water ports 27 to form the powerful, high velocity, intermixed jet stream 16.

The two sides of the housing are extended forwardly from the end wall 22 to form two laterally spaced side guide plates 24 and 25 for confining the sides of the jet stream. The character and force of the discharging jet stream can be controlled by means of a flap valve 30 which is pivotally suspended from a horizontal pivot pin 31 extending between the side guides 24 and 25 above the jet opening 23. The flap valve is forced upwardly by the discharging stream and can be forced downwardly, as shown in broken line in FIG. 3, into the stream by the thumb of the user, as shown in FIG. 1. The upward movement is limited to a horizontal position above the jet stream, as shown in solid line in FIG. 3, by means of stop shoulders 32 formed on the inner faces of the side guides 24 and 25, as shown in FIG. 5. When forced completely down, the flap valve substantially closes the jet opening 23.

The lower face of the flap valve is provided with a concave, arcuate depression 33 in axial alignment with the discharging jet to direct and guide the latter when in contact therewith. It can be seen that, when the flap valve is in the fully raised position, the maximum force of the jet stream will be directed forwardly and can be pointed in any desired direction for massage purposes by simply aiming the housing in the desired directions. The jet can also be directed, confined, and force-controlled by simply depressing the flap valve, into the stream as indicated in FIG. 1. The entrapped air in the jet stream forms interstices or "bubbles" therein which create a high frequency vibrating effect when the stream impinges upon the body tissues, which greatly facilitates the massaging action of the jet stream.

While a specific form of the invention has been described and illustrated herein, it is to be understood that the same may be varied within the scope of the appended claims, without departing from the spirit of the invention.

I claim:

1. A hydro-massage unit comprising:

a. a portable jet housing provided with a jet stream opening;

b. a flexible water tube terminating at its one extremity in said housing and having a coupling element at its other extremity for connecting said tube to a pressurized water source;

c. an elongated, tubular water nozzle in said housing connected at its one extremity to said water tube and axially directed toward said stream opening at its other extremity to direct a water jet through said opening;

d. an elongated substantially cylindrical air chamber in said housing in circumferential spaced relation to said nozzle;

e. an annular air passage opening from said air chamber and surrounding said water jet between said nozzle and said opening; and

f. a flexible air tube mounted upon and extending longitudinally of said water tube, said air tube being open to the atmosphere at its upper extremity and to said air chamber at its lower extremity, said air tube being of greater diameter and of less length than said water tube and longitudinally surrounding the lower portion of the latter and communicating with said air chamber.

2. A hydro-massage unit as described in claim 1 having:

a. a flap valve pivotally mounted on said housing forwardly of said opening upon a transverse axis so that said valve can be manually depressed into said discharging stream to control the character of the latter.

3. A hydro-massage unit as described in claim 1 having:

a. a valve guide plate projecting forwardly from said housing

at each side of said opening; and

b. a pivot axis mounted in and extending between said guide plates above said opening, said flap valve being pivotally mounted on said pivot axis and depending downwardly therefrom between said guide plates forwardly of said opening so as to be urged forwardly and upwardly by the discharging stream.

4. A hydro-massage unit as described in claim 3 having:

a. stop means for limiting the forward and upward movement of said flap valve at a point above the axis of the discharging stream so that it may be manually depressed into said stream and toward said opening for controlling the volume and direction of the stream.