

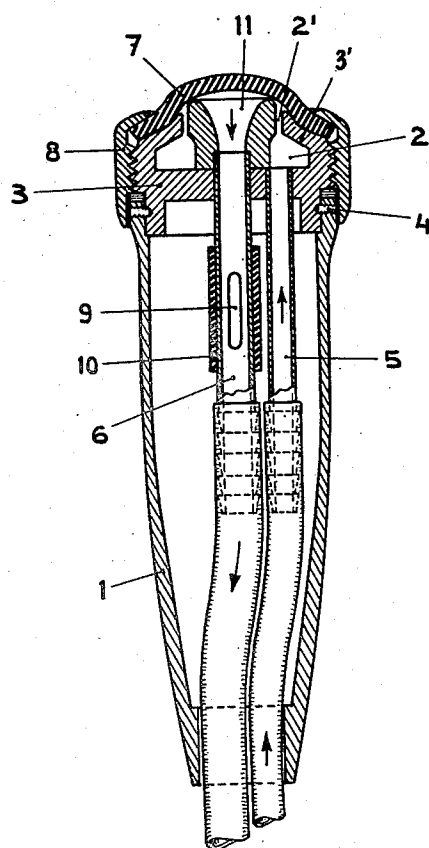
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MASSAGE DEVICE

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MASSAGE DEVICE

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This invention relates to massage devices in which an elastic membrane is vibrated by a flowing medium, for example, water.

An object of the instant invention is to construct a massage device in which vibration of the entire device is substantially eliminated.

A further object is to provide a device which is water tight and capable of use for massaging below water.

Most of the prior known massage devices of the type to which the instant invention is directed have the disadvantage that the outflow of the medium, producing the vibrations of the massage head, produces vibrations of such magnitude in the exhaust flow pipe that the entire device is set to vibrating. Attempts have heretofore been made to avoid vibration of the device as a whole by incorporating various expedients, such as fluid brakes and air pockets for example, in the exhaust pipe, or alternatively using a flexible hose for the whole, or a part, of the exhaust pipe. All such prior expedients have not resulted in the elimination of this disadvantage, and particularly so when the massage device is used for massaging under water.

I accomplish the desired result by providing at least one slit in the exhaust tube and sealing the slit by an elastic member. The slit or slits are preferably located in a region of the exhaust tube adjacent the region of introduction of the medium, and all parts through which the medium, preferably water, flows are disposed in a housing rendered water tight. Tests have demonstrated that the massage device of my invention does not vibrate as a whole when operated, even when used under water.

The foregoing and other objects and features of my invention will be understood more fully and clearly from the following detailed description of an illustrative embodiment thereof in conjunction with the appended drawing of which the single figure shows in elevational section such illustrative embodiment.

At its larger base, the frusto-conical housing 1 of my device supports an annular member 3 of rigid material having a recessed portion 2, a plurality of pins 4 affixing the annular member to the housing. Water inlet pipe 5 passing through the smaller base end of the housing is connected to the recessed portion 2, while water outlet pipe 6, centrally and axially disposed within the housing, passes through member 3 and opens into the outlet 11 which is centrally positioned in the recessed portion 2 and extends substantially to the inner surface of the mem-

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brane 7, which is clamped in position over the recessed portion and to the member 3 by a lock nut 8 threading onto the threaded outer surface of member 3. It will be noted that the member 3 has a reentrant ridge portion 3' over a portion of the recess 2 so that an annular channel 2', of which the radial dimension is substantially smaller than the radial dimension of recess 2, is formed from the recess 2 to the diaphragm between the ridge and the outer cylindrical surface of outlet 11. The upper (in the position shown in the drawing) surface of the outlet 11 is above the ridge 3', so that on tightening down on the lock nut 8, the membrane 7 of an elastic material such as rubber, is stretched thereover and covers and closes both the channel 2' and the outlet 11. At a region of the outlet pipe 6 just below the lower surface of member 3, the outlet pipe has a pair of diametrically opposite longitudinal slits 9 which are covered by rubber hose tubing 10 fitting tightly over the outlet pipe.

Water under pressure is admitted from a source, not shown, into inlet pipe 5, enters recess 2 and flows into annular channel 2' by its pressure causes a periodic extension and contraction of membrane 7. Water flowing through the channel 2', and on extension of the membrane between the membrane and the wall of outlet 11, flows into outlet 11 and thence into exhaust tube 6. In the exhaust tube the water has the variations in pressure which tend to produce the vibration of the entire device, which tendency, however, is substantially eliminated by the elastic tubing 10 covering the slits 9 yielding periodically according to the vibration of membrane 7. Thus no vibrations are transmitted to the water outlet tube and from the latter to the housing. Tests have shown that compensation of the periodic water pressure variations is optimum when the slits are positioned as close as possible to the point of admission of water into the outlet tube.

As the housing 1 closely seals all parts of the device through which water flows and all the parts, including the resilient membrane and the elastic tubing, are impervious to water, in operation the massage device of my invention can be used for massaging in water without the external water pressure affecting the vibration-compensating action of the elastic tubing 10.

Although but one specific embodiment of my invention has been shown and described, it will be understood that it is but illustrative and that various modifications may be made therein with-

out departing from the scope and spirit of my invention.

What I claim is:

1. Massage device comprising a substantially frusto-conical housing, a recessed member of rigid material affixed to the larger base of the housing and having an open top, a water inlet tube passing from externally the smaller base of the housing longitudinally within the housing into the lower portion of the recess, a water outlet within the recess centrally, the recessed member having an external wall of a height less than the height of the water outlet, an elastic diaphragm stretched over the open top of the recess and engaging the upper surface of the outlet, a tube connected to the outlet and extending longitudinally within the housing to externally the smaller base thereof, a longitudinal slit in the portion of the outlet tube in the housing beyond and adjacent the recess, and an elastic tube fitted over and closing the slit.

2. Massage device comprising an elongated housing, a member of rigid material having a formed recess therein affixed to one end of the housing and open at the end opposite the end affixed to the housing, an open ended hollow cylinder of rigid material affixed centrally of the recessed member and of a height greater than the depth of the formed recess, a resilient membrane, means for stretching the membrane over the open end of the recess and over and in contact with one open end of the hollow cylinder, means passing through the housing for admitting water under pressure into the recess and deflecting the stretched membrane from its contact with the one open end of the hollow cylinder to permit the flow of water into the hollow cylinder, water outlet means connecting to the hollow cylinder and extending centrally of the elongated housing, a pair of diametrically oppositely disposed longitudinal openings in the water outlet means within the housing and external the recess and adjacent the one open end of the hollow cylinder, and an elastic tube tightly fitted over the pair of slits and the adjacent region of the water outlet means to compensate for pressure variations in the water outlet means due to the periodic blocking and unblocking of the one open end of the hollow cylinder by the resilient membrane on the admission of water under pressure into the formed recess from the water admitting means.

3. Massage device according to claim 2 in which the resilient membrane, the means for stretching the membrane, the elastic tube and the housing are impervious to water, the water admitting means, the recess, the hollow cylinder, the water outlet means and the elastic tube are all water tight, and the portions of the water inlet and the water outlet means passing from the exterior into the housing are sealed by water tight seals to the housing.

4. Massage device comprising an elongated frusto-conical housing, a member of rigid mate-

rial comprising a bottom and an open ended cylinder of which the lower end snugly fits into an end of the housing, an intermediate region which is externally threaded, and the upper end has a reentrant ridge, a hollow cylindrical open ended outlet positioned on and centrally of the bottom and extending above the plane of the upper reentrant ridge of the open ended cylinder, the outer diameter of the outlet being less than the inner diameter of the ridge in such magnitude that there is formed therebetween an annular channel, an elastic diaphragm, a clamping nut threaded on the threaded intermediate region of the open ended cylinder and clamping the diaphragm between the nut and the ridge so that the diaphragm is stretched and deflected by contact with the upper face region of the outlet, a water inlet tube within the elongated housing and through the bottom of the member of rigid material to open into the chamber formed by the bottom, the upper portion of the cylindrical wall and the reentrant edge thereof and the outer cylindrical surface of the outlet, a water outlet tube connected to the outlet and passing through the bottom and the interior of the housing substantially axially thereof, a pair of diametrically opposite longitudinal slits in the outlet tube in the region thereof below the bottom and adjacent thereto, and an elastic tube tightly fitting over the slits and the regions of the water outlet tube adjacent the slits.

5. Massage device comprising an elongated housing, a member of rigid material across one transverse end of the housing and having a formed recess in its face directed outwardly from the housing, a hollow cylinder at the center of the member and of a height greater than the depth of the formed recess, a water inlet tube opening into the recess at a lower region thereof, a water outlet tube extending through the member and connecting to the interior of the hollow cylinder at the end thereof abutting the member, the outlet tube having a perforated portion within the interior region of the housing between the member and the other transverse end of the housing, an elastic diaphragm stretched over the outwardly directed transverse face of the member having the formed recess and engaging the transverse face of the hollow cylinder remote from the water outlet tube, and an elastic member stretched over and covering the perforated portion of the outlet tube.

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