Feb. 12, 1963 L. A. BOGAR 3,076,976

LIQUID AERATING AND AGITATING DEVICE

Filed Feb. 19, 1962 2 Sheets-Sheet 1

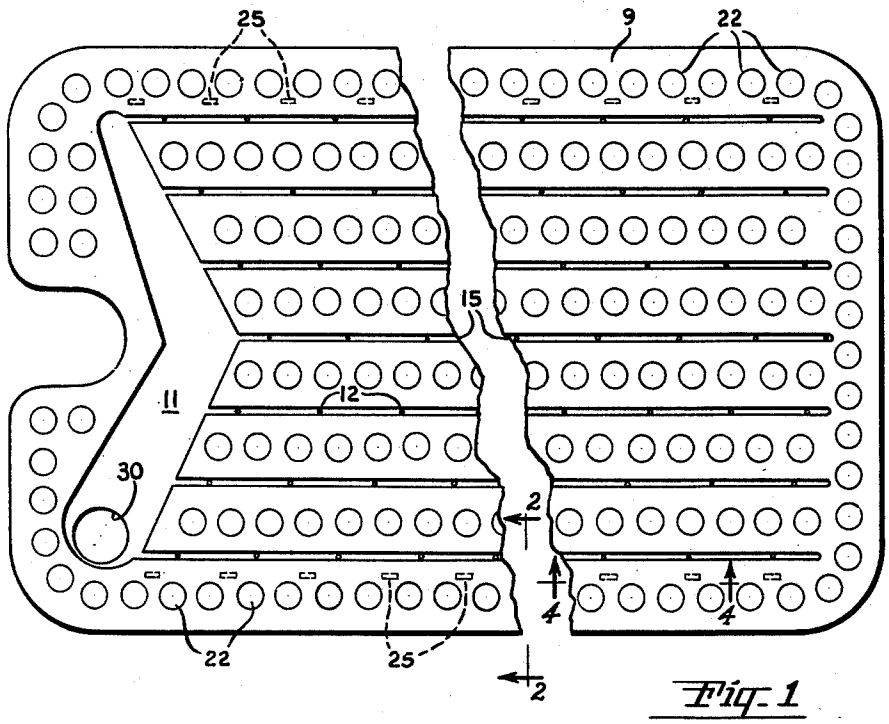


Fig. 1

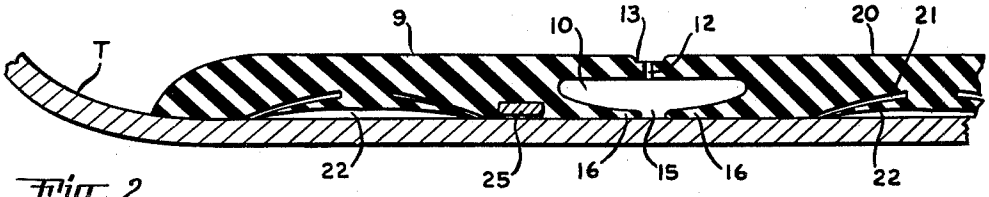


Fig. 2

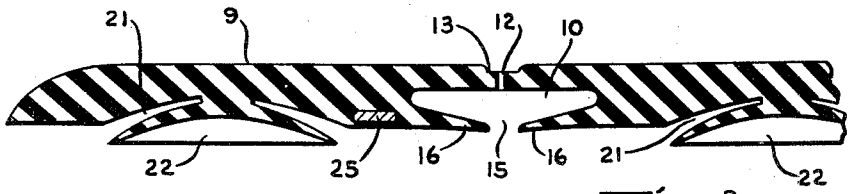


Fig. 3



Fig. 4

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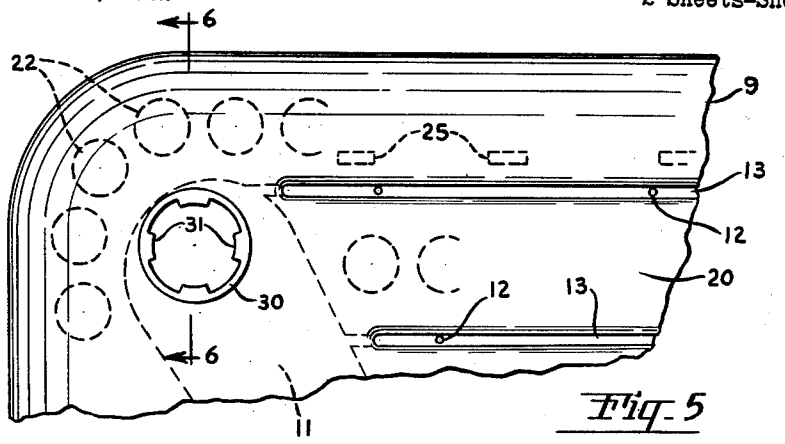


Fig. 5

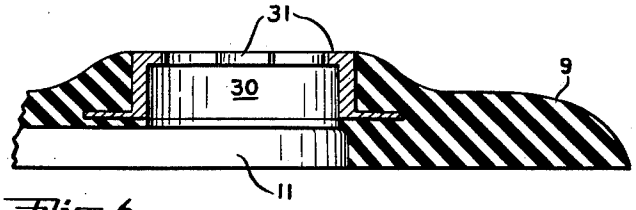


Fig. 6

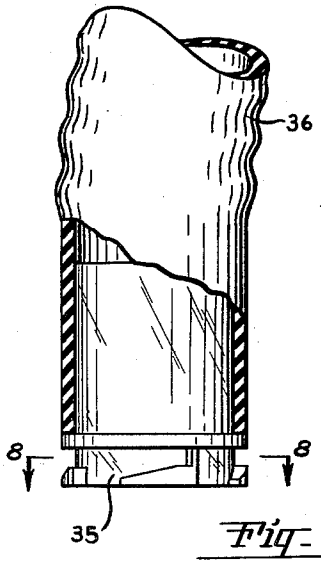


Fig. 7

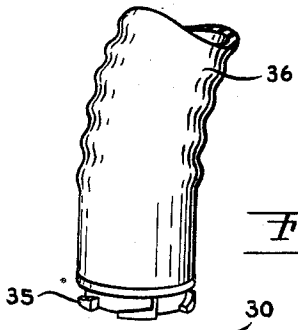
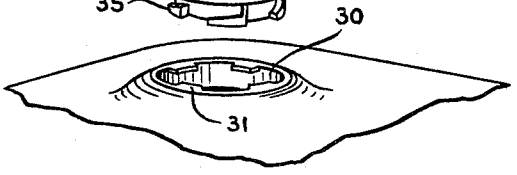


Fig. 9



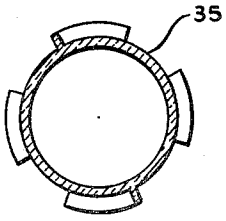


Fig. 8

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LIQUID AERATING AND AGITATING DEVICE

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Filed Feb. 19, 1962, Ser. No. 173,955
7 Claims. (Cl. 4—180)

This invention relates to a device for aerating and agitating a liquid in a tub or tank.

The device is made in the form of a rubber mat arranged to be attached to the bottom of a tub or tank. It is connected with an air blower and equipped with vented air channels that discharge air in streams of bubbles which rise through the liquid to aerate it and produce an agitating effect. The device may be used in a bath tub, for example, to produce a pleasant and therapeutic effect on the human body.

Objects of the invention are to provide a mat which may be affixed to the bottom of a tub or tank to aerate and agitate liquid such as water therein, to provide an improved form of construction for a device of the type described, and to provide a form of construction which is easily molded of rubber without requiring complicated molds to form the necessary air channels in the mat.

In the present construction the air channels are open on the bottom side of the mat whereby the mat may be very simply molded without requiring a complicated arrangement of cores as would be necessary to form closed tubular channels within the body of rubber. When the mat is applied to the bottom of a tub or tank the open sides of the channels are closed by the tub or tank so that the air is confined and forced to escape through the apertures provided in the top of the mat. The mat may be secured to the bottom of the tub or tank by suction cups or magnets or by a combination of both of these means. While the mat is described as made of rubber it is to be understood that in practice it may be made of any suitable material having the flexibility and resilience to function in the manner described.

Further details of construction will be explained and additional objects and advantages will become apparent from the following description of a preferred embodiment of the invention illustrated in the accompanying drawings. Various changes may be made, however, in the details of construction and arrangement of parts and all such modifications within the scope of the appended claims are included in the invention.

In the drawings:

FIGURE 1 is a bottom plan view of a device embodying the principles of the invention;

FIGURE 2 is an enlarged sectional view taken on the line 2—2 in FIGURE 1, showing the device secured to the bottom of a tub or tank;

FIGURE 3 is a view similar to FIGURE 2, showing the device removed from the tub;

FIGURE 4 is an enlarged sectional view taken on the line 4—4 in FIGURE 1;

FIGURE 5 is an enlarged fragmentary top plan view of a portion of the mat showing the air inlet connection;

FIGURE 6 is a sectional view on the line 6—6 in FIGURE 5;

FIGURE 7 is a view, partly in section, showing an air supply hose;

FIGURE 8 is a cross sectional view taken on the line 8—8 in FIGURE 7; and

FIGURE 9 is a fragmentary perspective view showing the air supply hose disconnected from the mat.

The mat 9 is of one piece integral construction having substantially all parts and appurtenances thereof made from a single body of rubber in a simple molding operation. The underside of the mat contains a plurality of longitudinal air channels 10 all connected at one end with a cross channel or manifold 11. At intervals along each channel 10 apertures 12 allow air bubbles to escape from the upper side of the mat. These apertures are preferably disposed in grooves 13 in the top surface so that a body resting on the mat will not close the apertures.

On the underside of the mat the channels 10 have a narrow slot opening 15 to permit the mat to be stripped from the mold in manufacture. Thus, the mold parts which form the channels 10 may be permanently connected with the bottom side of the mold and do not need to be inserted as core members supported in spaced relation from the bottom side of the mold. In order to prevent excessive uplift from the reaction of the air pressure against the bottom of the tub or tank T, the undersides of the channels 10 are partially closed by lips 16 so that the air pressure in the channels reacts against the bottom of the tub or tank over an area which is limited to the width of the slot 15.

On opposite sides of the channels 10 are ribs 20 each having recesses or cavities 21 on the underside of the mat. Contained within each recess 21 is an integral suction cup 22 for securing the mat to the bottom surface of the tub or tank. The recesses 21 are substantially edge to edge in a direction lengthwise of the mat and may be interconnected to provide a continuous groove for the suction cups, if desired.

Magnets 25 molded in the rubber may be utilized to provide additional means to secure the outer lips 16 and prevent escape of air from the channels 10 when the tub or tank bottom is made of a magnetic material such as iron or steel. In the present embodiment, the magnets are employed only adjacent to the outermost lips of the edge channels but they may also be employed adjacent to the other lips if desired. Alternatively, magnets may be used throughout the area of the mat instead of suction cups, if desired.

A fitting 30 is molded into the rubber in communication with cross channel 11 to supply air to the channels 10. This fitting is preferably equipped with bayonet joint-type locking fingers 31 to secure a mating fitting 35 on an air supply hose 36. Hose 36 is connected to a suitable blower which will supply a large quantity of air under relatively low pressure. When air is supplied from such source to the channels 10, the water is driven out and the channels are filled with air to provide streams of bubbles from the apertures 12 rising through the water above the mat.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. A liquid aerating and agitating device comprising a mat containing a plurality of air channels, means connected with said channels for supplying air thereto, apertures in the top side of the mat communicating with said channels, slots in the bottom side of the mat communicating with said channels, and means for securing the bottom of the mat to the bottom of a tub or tank so as to close said slots, said mat being made of a moldable resilient material such as rubber.

2. A device as defined in claim 1 including grooves in the top surface of the mat, said apertures communicating with said grooves.

3. A device as defined in claim 1, said slots being of less width than said channels and the margins of said

slots comprising pairs of opposed lips underlying said channels.

4. A device as defined in claim 3, said securing means comprising magnets adjacent to said lips.

5. A device as defined in claim 1, said securing means comprising suction cups between said channels.

6. A device as defined in claim 5, including recesses in the bottom of the mat between said channels, said suction cups being disposed in said recesses.

7. A device as defined in claim 6, said mat and suction cups being molded in one piece as an integral unit.

References Cited in the file of this patent

UNITED STATES PATENTS

2,044,407	Smith	June 16, 1936
2,636,520	Geist et al.	Apr. 28, 1953
2,754,136	Phillips	July 10, 1956
2,848,203	Misiura	Aug. 19, 1958
2,921,579	Munroe	Jan. 18, 1960
3,020,562	Reynolds	Feb. 13, 1962

FOREIGN PATENTS

813,995	Germany	Sept. 17, 1951