Nov. 2, 1948. T. SAACHY 2,452,794

BUBBLE MAKING MACHINE

Filed Jan. 18, 1946

FIG. 1

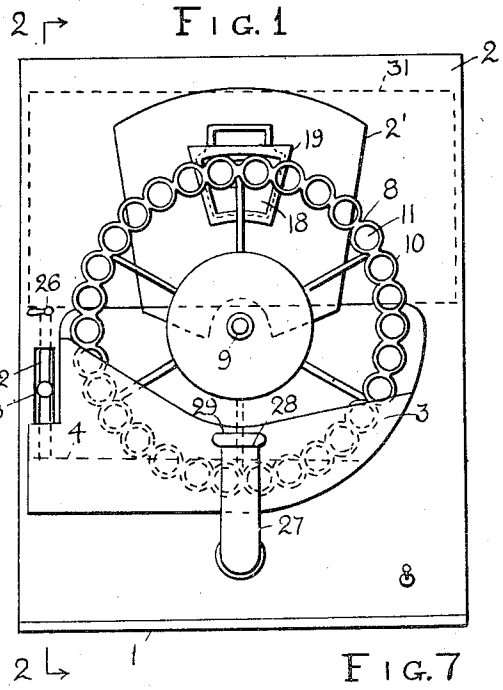


FIG. 3

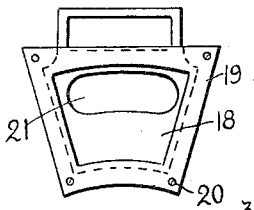


FIG. 4

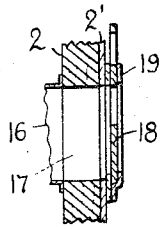


FIG. 5

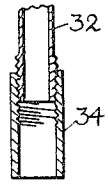


FIG. 6

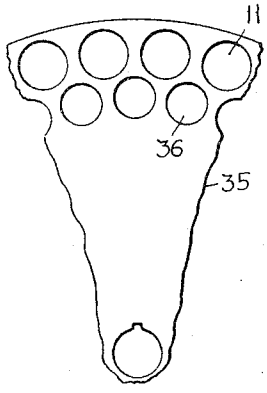


FIG. 7

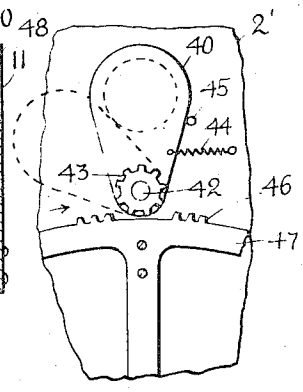
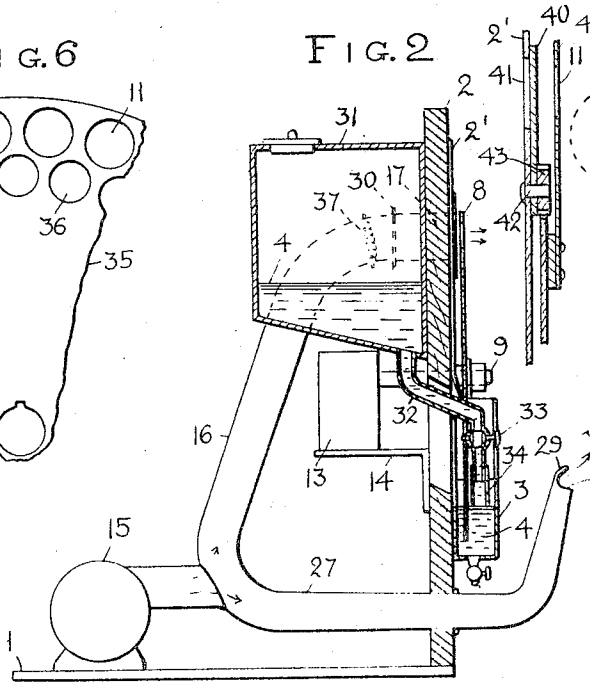


FIG. 2



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BUBBLE MAKING MACHINE

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My invention relates to bubble making machines and has particular reference to fountains or machines for making bubbles.

My invention has for its object to provide a device or machine which will automatically produce bubbles of a viscous liquid at a predetermined rate.

In one form of my invention, the device is adapted to making soap bubbles as means for creating a temporary scenic or ornamental effect, or as an amusement device, the bubbles being produced in a relatively large quantity and in different sizes. Such bubbles are usually of a very small thickness, comparable to the dimensions of wave lengths of light of different colors so that the bubbles, when properly illuminated, produce effect of being brightly colored in different shades of rainbow colors.

In another form of my invention I provide means to produce bubbles of a uniform size and at a regular rate. Such bubbles can be blown from a suitable plastic solution which will be rapidly hardened when exposed to the air in the form of a thin-walled bubble, thereby remaining as a permanent article of manufacture. In this manner it is possible to make plastic balls such as are used in a ping pong game, for various toys, christmas tree decorations, etc.

The foregoing and other objects, features and advantages of this invention are more fully described in the following specification and drawing in which:

Fig. 1 is a front view of my machine with a single row of bubble-producing rings;

Fig. 2 is an elevational sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a detail view of a removable mask forming an opening for the air blast which forms the bubbles;

Fig. 4 is a sectional elevational view of the same;

Fig. 5 is a fractional detail view of an adjustable end of the pipe for maintaining a constant level of the liquid in a vessel containing the bubble-forming solution;

Fig. 6 is a fractional view of a disc with a double row of the bubble-forming holes;

Fig. 7 is a fractional sectional view of a modified opening for the blast of air whereby the air duct is closed until the bubble-forming ring comes abreast of the opening;

Fig. 8 is a front view of the same.

My bubble forming machine as shown in Figs. 1 and 2 consists of a base 1 on which a front wall 2 is supported. An open trough 3 is secured to the front side of the wall 2 for a liquid 4 which is used

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for making bubbles. A bubble-forming disc 8 is fixed on a shaft 9 rotatively mounted in the front wall 2. The diameter of the disc 8 is such that it is immersed into the liquid in the trough 3 to such an extent as to cover rings 10 formed at the periphery of the disc and having openings 11 in which a thin film of the liquid is formed when the rings leave the liquid during rotation of the disc. The disc is rotated by a motor 13 of a sufficiently low speed, preferably having a high ratio transmission gearing. The motor is mounted on a suitable bracket 14 extending from the rear side of the wall 2.

For blowing the liquid film in the openings 11, a blower 15 is provided operated by a suitable motor mounted on the base 1. The exhaust opening of the blower is connected by a duct 16 with an opening 17 in the wall 2. This opening is sufficiently large to provide a blast of air for a disc containing more than one row of the openings 11, such as shown in Fig. 6. For a single row of the openings 11 the air duct is closed at the front with a shield or slide 18 slidably and removably placed in a socket 19 attached to the front side of a removable apron 2' as by screws 20 shown more clearly in Fig. 3. The shield 18 has an opening 21 of a size sufficient to extend over two openings 11 in the disc 8, although it may be provided with a smaller hole for a single opening 11. A handle 22 extends from the shields 18 for its removal, the lower edge of the apron 2' overlaps the upper edge of the trough 3 for causing any drops of liquid collecting in the apron to flow back into the trough 3.

A speed regulating device of a conventional type is provided for the motor 13 with a handle 26 for adjusting the speed of the motor so as to produce the bubbles at a desired rate of speed or in a desired quantity per minute. A similar speed controlling device (not shown) may be provided for the blower motor for controlling the size of the bubbles and also thickness of the walls.

A portion of the air blast is diverted through a duct 27 to the front of the machine and upward where the air is emerged through a nozzle 28. A lip 29 deflects the air away from the disc 8 to avoid blowing the air against the bubbles in the process of their formation. This additional air serves to blow the formed bubbles upward, scattering them throughout the space in front and above the machine.

A wire screen 30 may be placed in the duct 16 for slightly reducing the force of the air blast.

For maintaining a desired thickness of the bubble-forming film on the openings 11, it is im-

portant to maintain a constant level of the liquid in the open trough or vessel 3. The liquid for this purpose is supplied to the trough from a reservoir or tank 31 supported at the rear side of the wall 2 at an elevation above the open vessel 3 and is provided with a feed pipe 32 having a control valve or cock 33. The lower end of the pipe is provided with a telescopically adjustable nipple 34 shown more clearly in Fig. 5 and threaded on the end of the pipe 32. By turning the nipple, it can be raised or lowered thereby raising or lowering the position of the end of the pipe in the trough or vessel 3. With this arrangement the level of the liquid in the trough 3 will be automatically maintained constant as long as there is a liquid in the tank 31, and assuming of course that the reservoir 31 is air-tight.

For making a larger number of bubbles of different sizes a disc 35 can be used as shown in Fig. 6, having a double row of openings 11, 36. The shield 18 can be then removed or replaced with another shield having an opening of a size to register with the upper and lower holes 11, 36.

An electric heater 37 can be provided in the duct 16 for heating the air which is used for blowing the bubbles. In such a case the bubbles, being filled with warm air, will have a natural tendency to rise in the air. The heated air is also useful for blowing bubbles of a more viscous liquid, such as a solution of a plastic composition. By properly selecting the consistency of the solution, a substantially heavier film can be formed on the rings 11, and by suitably adjusting the force of the air blast, the thickness of the walls of the bubbles can be controlled within desired limits, for producing hollow spheres of a plastic composition to be used as Christmas tree decorations, toy balls, or game balls such as ping-pong balls. By blowing the bubbles upwards and filling them with heated air, the bubbles may be made to remain floating in the air for a sufficiently long time until the plastic is properly hardened.

For obtaining bubbles of a uniform size, it is desirable to provide means for blowing air periodically at the films in the openings so that the air will be admitted only when the opening 11 is fully registered with the air duct. Such a mechanism is shown in Figs. 7 and 8 and comprises a cover 40 for an opening 41 through which the air is admitted from the duct 16. The cover plate 40 rotates on a shaft 42 secured in the wall 2'. A pinion 43 is fastened to the cover plate or shutter 40. A spring 44 urges the disc 40 against a stop 45 in which position the disc 40 closes the air opening 41. The pinion 43 is periodically engaged by spaced groups of gear teeth 46 on a ring 47 fastened to a disc 48 with holes 11. The teeth 46 are so arranged that they rotate the cover 40 away from the opening at the moment when the opening 11 registers with the opening 41, and release the pinion, allowing the cover 40 to close the opening 41, until the next opening 11 reaches the air opening 41.

It should be noted that the holes 11 are spaced according to the desired size of the bubbles. For larger bubbles the spacing must be, of course, correspondingly increased, to avoid any possible interference between the adjacent bubbles.

It will be understood that various features and principles of each of the embodiments of the invention above described or referred to may be utilized or substituted in the other embodiments.

While the invention has been described in detail with respect to certain particular preferred examples, it will be understood by those skilled in

the art after understanding the invention, that various changes and further modifications may be made without departing from the spirit and scope of the invention, and it is intended therefore, in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. A bubble making machine comprising a base; a vertically extending wall supported on the base; a disc rotatively supported on the wall for rotation in a vertical plane; means rotating the disc, the disc having a plurality of openings near its periphery; an open vessel for a viscous liquid supported at the lower portion of the wall enclosing the lower portion of the disc and the openings therein, the openings in the disc entraining the liquid in the form of films; the upper portion of the wall extending above the top of the disc and the openings therein; the wall having an opening in its upper portion opposite the openings in the disc; a shutter intermittently closing the opening in the wall; means producing a draft of air; and means directing the draft of air through the opening in the wall and through the openings in the disc for producing bubbles.

2. A bubble making machine comprising a disc having a plurality of openings near its periphery; means rotatively supporting the disc for rotation in a vertical plane; means rotating the disc; a vessel open at the top associated with the disc for a viscous liquid, the lower portion of the disc and the openings therein being immersed into the liquid in the vessel for forming films of the liquid in the openings; means producing a draft of air; means directing the draft of air against the openings in the disc for forming bubbles from the films; and means directing the flow of air upwards against the bubbles for raising the bubbles in the air.

3. A bubble making machine comprising a disc having a plurality of openings near its periphery; means rotatively supporting the disc for rotation in a vertical plane; means rotating the disc; a vessel open at the top associated with the disc for a viscous liquid, the lower portion of the disc and the openings therein being immersed into the liquid in the vessel for forming films of the liquid in the openings; means produring a draft of air; means directing the draft of air through the openings in the disc for forming bubbles from the films; and means heating the air for the bubbles.

4. A bubble making machine comprising a base; a wall supported on the base; a disc rotatively supported on the wall for rotation in a vertical plane; means rotating the disc, the disc having a plurality of openings near its periphery; an open vessel for a viscous liquid supported at the lower portion of the disc and the openings therein the wall having an opening in its upper portion opposite the openings in the disc; means producing a draft of air; means directing the draft of air through the opening in the wall and through the openings in the disc; and an apron at the front of the wall for directing drops of the liquid from the disc back into the vessel.

5. A bubble making machine comprising a base; a wall supported on the base; a disc rotatively suported on the wall for rotation in a vertical plane; means rotating the disc, the disc having a plurality of openings near its periphery; an open vessel supported at the lower portion of the wall enclosing the lower portion of the disc and the openings therein, the wall having an opening in its upper portion opposite the openings in the disc;

means producing a draft of air; means directing the draft of air through the opening in the wall and through the openings in the disc; and a slide removably supported at the front of the opening in the wall with a hole of a reduced size.

6. A bubble making machine comprising a base; a wall supported on the base; a disc rotatively supported on the wall for rotation in a vertical plane; means rotating the disc, the disc having a plurality of rows of openings of different sizes; an open vessel supported at the lower portion of the wall enclosing the lower portion of the disc and the openings therein, the wall having an opening in its upper portion opposite the openings in the disc; means producing a draft of air; and means directing the draft of air through the opening in the wall and through the openings in the disc.

7. A bubble making machine comprising a base; a wall supported on the base; a disc rotatively supported on the wall for rotation in a vertical plane; means rotating the disc, the disc having

a plurality of openings near its periphery; an open vessel supported at the lower portion of the wall enclosing the lower portion of the disc and the openings therein, the wall having an opening in its upper portion opposite the openings in the disc; means producing a draft of air; means directing the draft of air through the opening in the wall and through the openings in the disc; a shutter normally closing the opening in the wall; and means on the disc rapidly opening the shutter when the opening in the disc is directly opposite the opening in the wall.

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