Dec. 25, 1945. A. RASPET 2,391,797

TOY

Filed Jan. 10, 1945

Fig. 1.

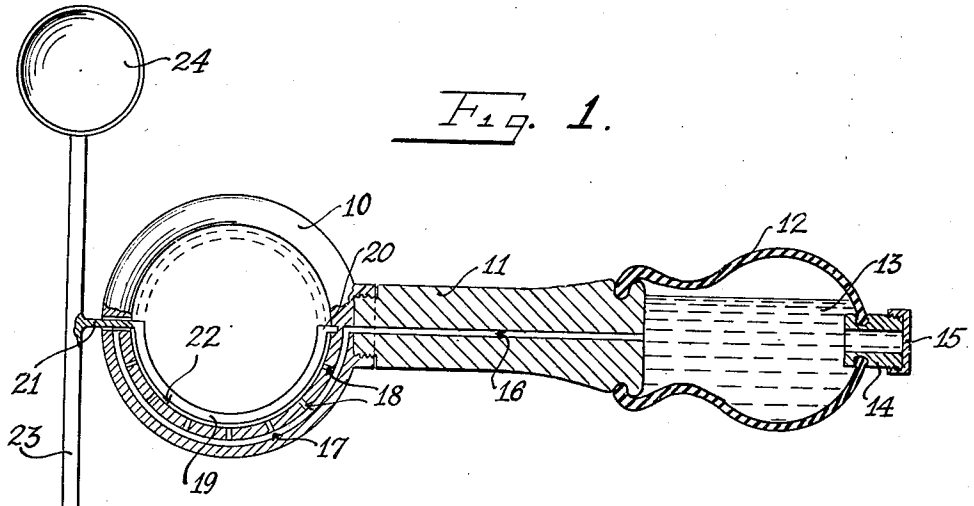


Fig. 2.

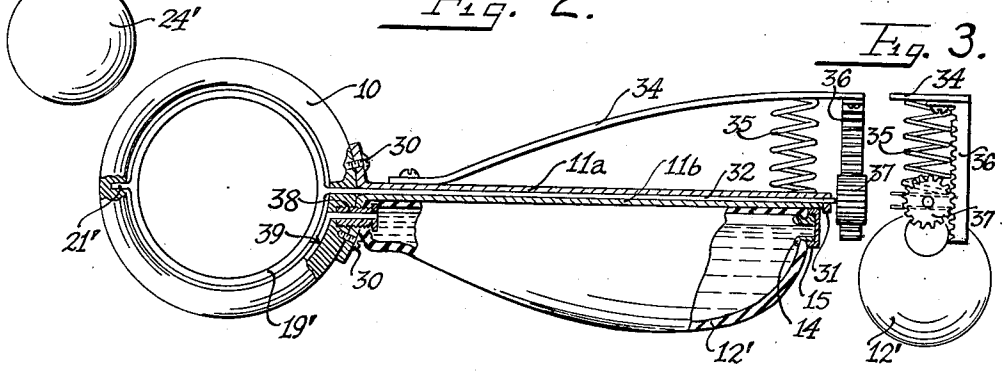


Fig. 3.

Fig. 4.

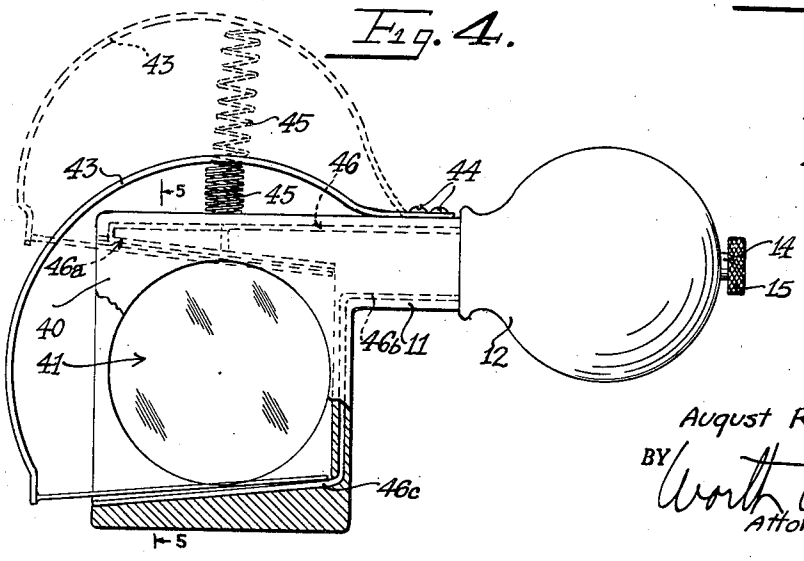
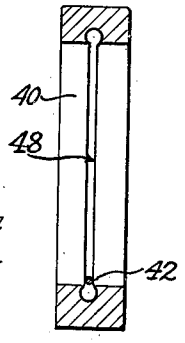


Fig. 5.



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UNITED STATES PATENT OFFICE

2,391,797

TOY

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Application January 10, 1945, Serial No. 572,106

4 Claims. (Cl. 46—8)

This invention relates in general to toys and, in particular, to a toy adapted to produce bubbles automatically and continuously in sequence.

Heretofore, toys for the production of bubbles have consisted of a simple blow pipe which was immersed in a soap solution and bubbles produced by blowing through the pipe. Such prior toys required that the stem of the pipe be inserted in the mouth, thus giving rise to the possibility of contamination and the spreading of disease. In another form of bubble producing toy there was provided a ring which was adapted to be dipped into a soap solution and bubbles formed by drawing the ring rapidly through the air. Such ring toys were unsatisfactory in that only a few bubbles could be produced with each dipping and no means was supplied for continually applying the soap solution to the ring. However, it is desirable for purposes of amusement to provide a bubble producing toy which is adapted to produce numerous bubbles in sequence and substantially continuously without the necessity of dipping the toy in a liquid, or without requiring its insertion in the mouth.

Accordingly, it is a general object of the present invention to provide such a toy and one which will be free from the objectionable features of prior toys.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

According to the present invention there is provided a bubble producing toy comprising a ring member, another ring concentrical with the first ring and adapted and arranged to be rotated within and in close proximity to the inner surface of the first ring, means for supplying a bubble forming liquid to the space between the rings, means for rotating the inner ring, and a handle on the outer ring. In one embodiment of the toy, the means for rotating the inner ring is an air driven propeller which is adapted to be rotated when the toy is drawn rapidly through the air. In a second embodiment of the invention, the means for rotating the inner ring comprises a shaft extending through the handle, the free end of the shaft being provided with a toothed wheel and reciprocating ratchet mounted on the handle in such position as to rotate the toothed wheel.

For a more complete understanding of the nature and objects of the invention, reference should be had to the accompanying drawing in which:

Fig. 1 is a side elevation, partly in section, of one embodiment of the toy of the invention;

Fig. 2 is a side elevation, partly in section, of a second embodiment of the toy of the invention;

Fig. 3 is an end elevation of the toy illustrated in Fig. 2 taken from the right hand side;

Fig. 4 is a side elevation, partly in section, of a third embodiment of the toy of the invention and

Fig. 5 is a cross section of the toy illustrated in Fig. 4, taken along the lines 5—5 thereof.

In that embodiment shown in Fig. 1, the toy comprises an outer fixed ring 10 provided with a handle 11 terminating in the free end in a collapsible bulb 12 adapted to hold the bubble producing liquid 13, the bulb being provided with a threaded inlet 14 having a cap 15. The handle 11 is channeled through the center to provide a passage 16 for the bubble forming liquid, and at least one-half of the ring 10 is channeled, as shown in Fig. 1, to provide a liquid passage 17 therearound with a plurality of outlet holes 18 arranged to supply the bubble forming liquid to the interior surface of at least one-half of the ring 10. Within the ring 10 there is disposed a rotatable ring or partial ring 19 which is pivotally mounted at one side 20 in the ring 10, the other side of the ring 19 fixed to a shaft 21 passing through a hole in the ring 10 and rotatably mounted therein. The ring 19 is of such diameter with respect to the inner surface of the ring 10 that only a narrow capillary channel 22 remains between the rings. The ring 19 is adapted to be rotated in the embodiment shown in Fig. 1 by means of a propeller. The propeller shown in Fig. 1 comprises a shaft 23 mounted in its center in the shaft 21 and terminating at each end in cups 24 and 24', the cups facing in opposite directions. It is to be understood that the ring 19 can extend half way around the inner surface of the ring 10, or all the way around as shown in Fig. 2, and whether it extends part or all the way around, it will be termed a "ring" in the following description and the appended claims.

To operate the toy shown in Fig. 1, the handle is grasped with the hand and the bulb 12 is squeezed to force the liquid 13 through the channels 16 and 17 and to cause the liquid to exude through the channels 18 and fill the space 22 between the ring 10 and the ring 19. If the toy is now drawn quickly through the air, such movement will rotate the propeller and thus cause the ring 19 to be rotated, thereby drawing the bubble forming liquid into a film in the space enclosed by the ring 10 while the air passing through the center of the ring 10 will cause the film to form a bubble. With each rotation of the ring 19 another bubble is produced so that a multiplicity of bubbles comprising a continu-

ous stream can be produced by continuously whirling the toy through the air. The bubbles will continue to be formed until the liquid in the bulb 12 has been exhausted, whereupon the cap 15 is removed and the bulb refilled.

In that embodiment shown in Fig. 2, the toy comprises an outer ring 10 to which are fixed outwardly extending strips 11a and 11b of rigid sheet material which is attached to the ring by suitable means, for example, by means of screws 30. The free end 31 of the strip 11a is bent downward and pierced to rotatably support an elongated shaft 32 which passes through a channel in the ring 10 and is fixed to an inner ring 19'. To promote smooth rotation and to properly center the ring 19', it may be provided with a projecting shaft 21' which extends part way or all the way through opposite sides of the ring 10 from the shaft 32. To rotate the shaft 32, there is provided a second strip of resilient material 34, such as a strip of spring steel, which is attached to the strip 11a at a point adjacent the ring 10 and which is supported at the other end by means of a coil spring 35. The free end of the strip 34 is attached to a downwardly extending rack 36, the teeth of which mesh with the teeth of a pinion wheel 37 which is fixed to the free end of the shaft 32. On the under side of the shaft 32 there is mounted a second sheet of stiff material 11b, and to this is glued or otherwise suitably affixed a collapsible bulb 12' having an inlet 14 provided with a screw cap 15 and communicating at the other end by means of a nipple 38 with the liquid channel 17 which is provided with liquid outlet channels 18 of the type shown in Fig. 1.

To operate the toy of Fig. 2, the bulb 12' is filled with bubble forming liquid and the toy grasped with the hand disposed with the thumb on the reciprocating lever 34 and with the fingers around the bulb 12'. By drawing the bulb through the air and simultaneously squeezing the hand, the rack 36 is depressed, causing the pinion 37 to rotate and drive the shaft 32. This shaft causes a rapid rotation of the ring 19' while the bubble forming liquid is continuously supplied through the channels 17 and 18 to the space 22 between the rings 10 and 19'. Accordingly, when so operated, a stream of bubbles will be produced in continuous sequence so long as there is liquid in the bulb 12'.

As shown in Fig. 3, when the lever 34 is reciprocated, the rack 36 causes a rotation of the gear 37 and of the ring 19'.

In that embodiment shown in Figs. 4 and 5, the apparatus comprises as in Fig. 1, a handle 11, an elastic bulb 12 adapted to contain a liquid, the handle terminating in a rectangular head 40 which is provided with a central, more or less, circular opening 41; the head is provided with a channel 48 through the center as shown in Fig. 5 of just sufficient width to accommodate a thin wire 42 which is extended outside the head and is attached on the outside to the end of a spring lever 43, the lever being attached to the handle by means of the screws 44 and normally urged away from the handle by the coil spring 45; the handle 11 is provided with a liquid channel 46 which extends through the head portion and then opens into a groove 46a and with another channel 46b which extends down one side and opens into horizontal groove 46c; the grooves 46a and 46c communicate with the interior channel 48 in which the wire 42 reciprocates. When the bulb 12 is pressed, the liquid is forced through the channel 46 and 46b and fills the grooves 46a and 46c, thus the liquid contacts the wire 42 no matter whether this wire is on the top or bottom of its channel 48. When the lever 43 is depressed, the wire carries the film over the opening 41. If the device is now drawn through the air, the film will be formed into a bubble. The wire 42 is now in contact with the liquid in the open channel 46c so that the wire is again wet. If pressure is now removed from the spring 43, another film will be drawn across the opening 41. Thus a bubble will be formed with each downward or upward stroke of the wire 42. It is clear, therefore, that this embodiment differs from the embodiment shown in Figs. 1 and 2 by reason of the fact that the film-forming member 42 reciprocates across the opening 41 instead of revolving in the opening.

The toy of the present invention can be made of rustproof, non-breakable, non-corrosive materials such, for example, as molded thermoplastic cellulose derivatives, thermoplastic or thermosetting resins, glass, wood, metal and the like. For example, the ring 10, the handle 11, the inlet 14 and the cap 15 and the propeller 23 are preferably made of molded plastics. The bulb 12 is made of rubber, either natural or synthetic, and the ring 19 of stainless steel, aluminum or other rustproof metal. The toy may be attractively colored, decorated with dyes, pigments, printing or other means.

The toy of the present invention may employ any suitable bubble forming liquid, but there is preferably employed the bubble forming composition described and claimed in my copending application Serial No. 560,519 filed October 26, 1944.

The toy of the present invention is characterized by simplicity of design and by not requiring any part thereof to be inserted in the mouth and by not requiring the dipping of any part in an open vessel of liquid. The present toy produces bubbles substantially continuously in sequence and may be used for all amusement purposes, entertainment and the like. Since the liquid channels 17 and 18 may be constructed in a suitable manner so that the liquid is supplied only as required, there is no tendency for the bubble forming liquid to drip upon the floor or carpets, which is frequently the case with prior bubble forming devices.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a bubble producing toy, the combination of a rigid member having a circular opening therein, means to supply a bubble forming liquid adjacent to said edge of said opening and means to spread said liquid as a film over said opening.

2. In a bubble producing toy, the combination of a rigid member having a circular opening therein, means to supply a bubble forming liquid adjacent to said edge of said opening and a ring member positioned in and concentrical with said opening and means to rotate said ring in said opening, thus carrying a film of the liquid across said opening.

3. In a bubble producing toy, the combination

of a rigid member having a circular opening therein, means to supply a bubble forming liquid adjacent to said edge of said opening, a wire extending across said opening and means to reciprocate a wire across said opening so as to spread a film of said liquid over the opening.

4. In a bubble forming toy, the combination of a rigid ring, a handle on said ring, a collapsible bulb on the free end of said handle, the liquid channel extending through said bulb from said handle to said ring, the liquid channel within said ring communicating with said channel of said handle, liquid outlets through the channel in said ring opening on the interior surface of said ring, a curved wire rotatably mounted in the interior of said ring and curved to conform closely to the interior surface of said ring and means to rotate said wire whereby liquid present on the interior surface of said ring is spread into a film extending over the opening in said ring.

AUGUST RASPET.