

[54] **BUBBLE BLOWING TOY GUN**

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[58] Field of Search46/1 E, 7

[56] **References Cited**

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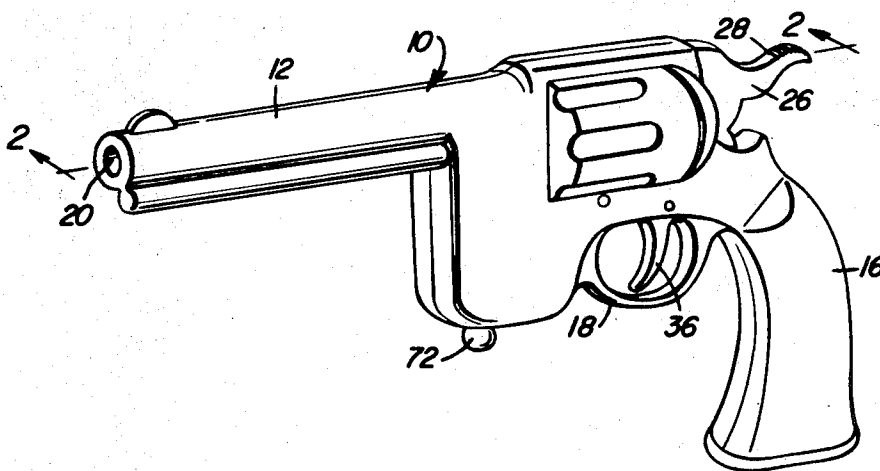
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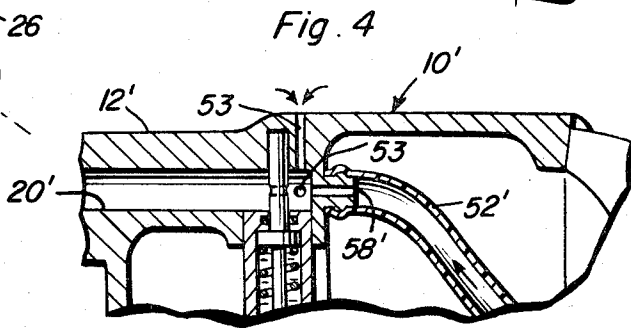
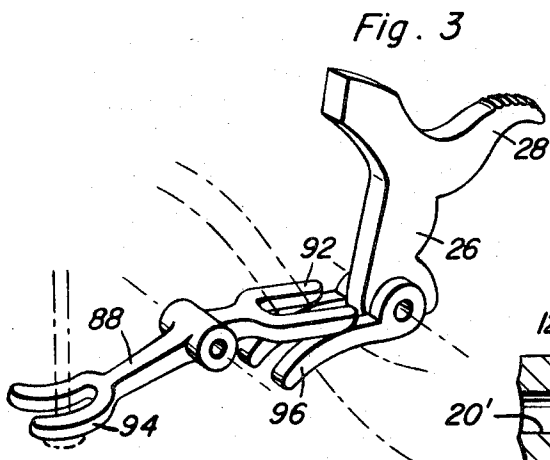
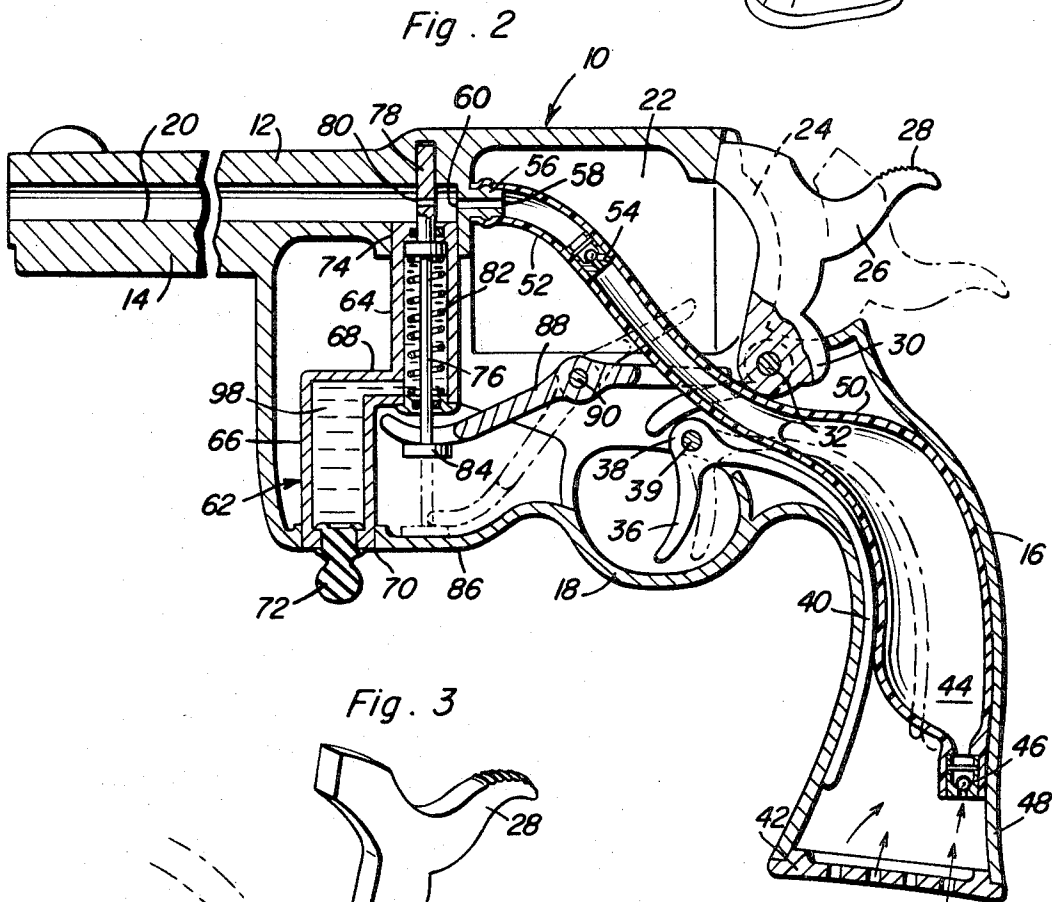
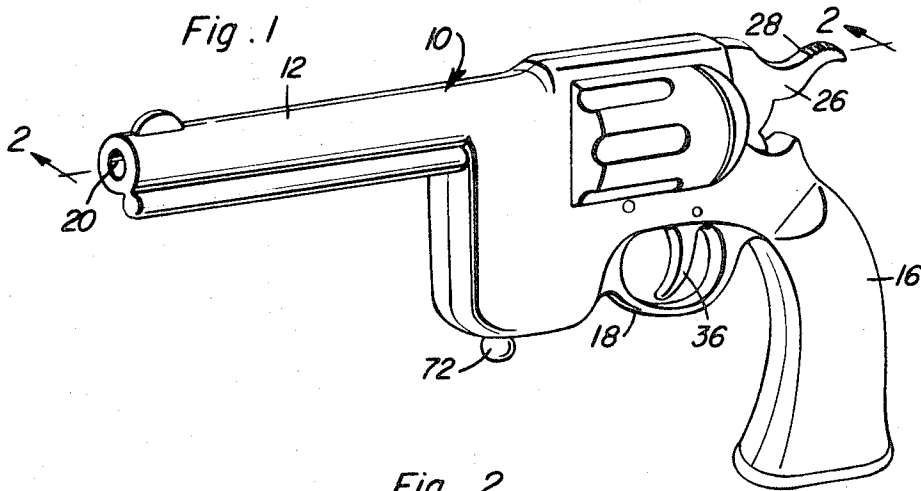
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[57] **ABSTRACT**

A bubble producing device including a walled reservoir for a bubble producing liquid, and also an intermittently operable compressed gas jet producing structure disposed outward of the reservoir with liquid conveying structure operatively associated with the walled reservoir for selectively conveying measured quantities of liquid from the reservoir to a position for acting upon by the gas jet producing structure.

10 Claims, 4 Drawing Figures





BUBBLE BLOWING TOY GUN

The bubble blowing toy gun of the instant invention has been designed in a manner whereby a controlled jet of air under pressure may be discharged into an area or toward a position in which a measured quantity of bubble producing liquid is disposed. The gun is equipped with a trigger which may be repeatedly actuated and the trigger is operatively associated with an air compressing structure whereby a jet of air may be produced each time the trigger is actuated. Further, the gun includes liquid conveying structure operatively associated with a walled reservoir for containing a supply of bubble producing liquid and the liquid conveying structure, when actuated, is operable to convey a measured quantity of liquid from the reservoir to a position at least adjacent the area into which a jet of air is discharged upon actuation of the trigger. Also, the gun is provided with a hammer operatively associated with the liquid conveying structure whereby the process of conveying liquid from the reservoir therefor to a position for acting upon by a jet of air formed is completed each time the hammer of the pistol is actuated, the trigger and hammer being operable independently of each other.

Although the bubble blowing toy gun of the instant invention may utilize a soap and water solution as the bubble producing liquid, many other available materials including sulphonated alcohol preparations, aryl sulphonates, or similar components in which the surface tension is sufficiently low to permit the ready formation of bubbles may be utilized in lieu of a water and soap solution.

The main object of this invention is to provide a bubble blowing toy gun including independently operable mechanisms for selectively conveying measured quantities of bubble producing liquid and discharging jets of air under pressure into a bubble formation area, whereby several jets of air may be utilized to form bubbles for each delivery of bubble producing liquid to the bubble forming area and thereby enable only as much bubble producing liquid to be used as is necessary before the supply of bubble producing liquid in the bubble forming area is replenished.

Another object of this invention is to provide a bubble blowing toy gun in accordance with the preceding object and which is constructed in a manner which will substantially eliminate any leakage of bubble producing liquid from the gun.

A final object of this invention to be specifically enumerated herein is to provide a bubble blowing toy gun which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a perspective view of the bubble blowing toy gun of the instant invention;

FIG. 2 is an enlarged fragmentary vertical sectional view taken substantially upon the plane indicated by the section line 2—2 of FIG. 1;

FIG. 3 is a perspective view of a portion of the hammer actuated bubble producing liquid conveying structure; and

FIG. 4 is a fragmentary enlarged vertical sectional view similar to the central upper portion of FIG. 2 but illustrating a modified form of gun.

Referring now more specifically to the drawings the numeral 10 generally designates the toy gun of the instant invention. The gun 10 includes a body 12 simulating, generally, a revolver and including a barrel portion 14, a hand grip portion 16 and a trigger guard 18.

The barrel portion 14 has a bore 20 formed therein and a substantial portion of the body 12 is hollowed out as at 22. The upper rear portion of the body 12 has an upstanding slot 24 formed therein and a hammer member 26 including a serrated thumb engageable tang 28 includes a mounting portion 30 disposed within the body 12 and pivotally supported therefrom as at 32. The hammer member 26 is oscillatable through the slot 24.

A trigger member 36 is disposed within the trigger guard 18 and includes a mounting portion 38 disposed within the body 12 and pivotally supported therein as at 39. The trigger member 36 includes a rearwardly extending and downwardly curving integral arm 40 which projects downward into the hollow hand grip portion 16 and the lower end of the hand grip portion 16 includes an apertured bottom wall 42.

A hollow flexible and air impervious bladder 44 is supported within the hand grip portion 16 and includes a lower end portion provided with an air inlet check valve 46 anchored to the rear wall 48 of the hand grip portion 16. The upper end of the bladder 44 merges smoothly into an integral neck portion 50 which in turn terminates in an integral air delivery tube 52 passing between the hammer member 26 and the trigger member 36. The discharge end of the air delivery tube 52 has a second jet valve 54 secured therein and the terminal end of the air delivery tube 52 is telescoped over a nipple 56 having a bore 58 formed therethrough whose discharge end opens into the inner end of the bore 20 as at 60.

A walled liquid reservoir referred to in general by the reference numeral 62 and disposed in upstanding position within the body 12 is provided. The reservoir 62 includes upper and lower upstanding and horizontally offset tubular legs 64 and 66 joined by a connecting portion 68 and the lower end of the leg 66 opens downwardly through the body as at 70 and is closed by means of a removable plug 72. The upper end of the leg 64 is anchored in a bore 74 formed in the body 12 and opening into the inner end of the bore 20. A spring urged rod 76 is reciprocal longitudinally through the leg 64 and includes an upper end extension 78 slidably received through the closed upper end of the leg 64 in fluid tight sealed engagement therewith. The upper end extension 78 includes a diametric bore 80 which is registerable with a discharge end of the bore 58 when the rod 76 is in its uppermost position under the biasing action of the compression spring 82. The lower end of the rod 76 is slidably received through the closed lower end of the leg 64 in fluid tight sealed engagement therewith and includes an enlarged head 84.

From FIG. 2 of the drawings it may be seen that the rod 76 may be reciprocated between the uppermost limit position thereof illustrated in solid lines and a lower limit position illustrated in phantom lines with

the head 84 abutted against the underlying lower wall portion 86 of the body 12.

A lever 88 is pivotally supported within the body 12 as at 90 and includes first and second bifurcated ends 92 and 94. The bifurcated end 94 embracingly engages the rod 76 immediately above the head 84 and may therefore exert downward pressure on the latter in order to shift the rod 76 from the upper solid line position illustrated in FIG. 2 to the lower phantom line position illustrated in FIG. 2. In addition, the hammer member 26 includes a bifurcated arm 96 which underlies the bifurcated end 92 and is therefore operable to oscillate the lever 88 from the solid line position of FIG. 2 to the phantom line position of FIG. 2 when the hammer member 26 is pivoted from the solid line position of FIG. 2 to the phantom line position of FIG. 2. Of course, when the rod 76 is in its lowermost position, the bore 80 is retracted downwardly into the upper end of the interior of the leg 64 and thus lowered into the bubble producing liquid 98 within the reservoir 62.

In operation, when it is desired to cause the gun 10 to produce bubbles, the hammer member 26 is swung rearwardly from the solid line position of FIG. 2 to the phantom line position of FIG. 2 in order to retract that portion of the upper end extension 78 of the rod 76 having the bore 80 formed therethrough down into the interior of the upper end of the leg 64 whereby the bore 80 will be filled with bubble producing liquid 98. Then, as the hammer member 26 is released and urged back to the solid line position by means of the spring 82 acting upon the rod 76 and thus the lever 88, the bore 80 is moved back into registry with the bore 58. Thereafter, the trigger member 36 may be repeatedly pulled rearwardly in order to repeatedly compress the bladder 44 with the arm 40 in order to expel air from the bladder through the check valve 54 and outwardly through the bore 58 toward the bore 80. As the air discharged from the outlet end of the bore 58 is directed toward the bore 80, the bubble producing liquid within the bore 80 will produce bubbles that will be blown outwardly of the forward end of the barrel 20. After several repeated pulls on the trigger member 36, there may not remain sufficient bubble producing liquid in the bore 80 to produce bubbles. At this point, the hammer member 26 may again be pulled rearwardly so as to retract the bore 80 down into the reservoir 62 before releasing the hammer member 26 and again returning the liquid filled bore 80 into registry with the bore 58 after which the trigger member 36 may then again be repeatedly pulled in order to cause bubbles to be blown outward of the forward end of the barrel 20.

With attention now invited to FIG. 4 of the drawings, there will be seen a modified form of gun referred to in general by the reference numeral 10' and which is substantially identical to the gun 10 and therefore has the various components thereof corresponding to the same components of the gun 10 designated by similar prime reference numerals.

The gun 10' differs from the gun 10 in that the tube 52' and lower end of the bladder are not provided with check valves corresponding to the check valves 54 and 46. Instead, the body 12 is provided with a plurality of air inlet openings 53 opening into the rear end of the bore 20'. The operation of the gun 10' is substantially identical to the operation of the gun 10. As the trigger of the gun 10' is pulled, air is expelled from the bladder thereof through the tube 52' and outwardly through the

bore 58'. However, as the trigger is released, the bladder will expand and draw air back into itself through the apertures or bores 53 and the bore 58'.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A bubble producing device including a walled reservoir for bubble producing liquid, jet discharge means outward of said reservoir selectively operable to discharge a jet of gas into a predetermined area, liquid conveying means selectively operable to convey a small quantity of liquid from within said reservoir to a predetermined location in said area for acting upon by said jet of gas, said device including a body simulating hand gun, said body including a barrel defining portion and also enclosing said reservoir therewithin, said body including oscillating trigger defining means, said jet discharge means including an actuator therefor comprising said trigger defining means.

2. The combination of claim 1 wherein said barrel includes a longitudinal bore formed therein opening outwardly of the forward end thereof, said area comprising said bore.

3. A bubble producing device including a walled reservoir for bubble producing liquid, jet discharge means outward of said reservoir selectively operable to discharge a jet of gas into a predetermined area, liquid conveying means selectively operable, independently of said jet discharge means, to convey a small quantity of liquid from within said reservoir to a predetermined location in said area for acting upon by said jet of gas, said jet discharge means including means defining a gas outlet facing along a predetermined path, said liquid conveying means including means defining a short small diameter passage positioned, upon actuation of said conveying means to position said small quantity of liquid in said predetermined location, in axial registry with said gas outlet, said liquid conveying means including an elongated rod supported for longitudinal reciprocation through one wall portion of said reservoir between extended and retracted positions, said passage comprising a transverse passage formed through said rod disposed in said location when said rod is in said extended position and disposed within said reservoir when said rod is in said retracted position.

4. The combination of claim 3 wherein said device includes a body simulating a hand gun, said body including a barrel defining portion and also enclosing said reservoir therewithin, said barrel defining portion having a longitudinal blind bore formed therein, said area comprising the inner end of said blind bore.

5. The combination of claim 3 including means yieldingly biasing said rod toward said extended position.

6. A bubble producing device including a walled reservoir for bubble producing liquid, jet discharge means outward of said reservoir selectively operable to discharge a jet of gas into a predetermined area, liquid conveying means selectively operable, independently of said jet discharge means, to convey a small quantity of liquid from within said reservoir to a predetermined location in said area for acting upon by said jet of gas,

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said device including a body simulating a hand gun, said body including a barrel defining portion and also enclosing said reservoir therewithin, said barrel defining portion having a longitudinal blind bore formed therein, said area comprising the inner end of said blind bore, said body including pivotally oscillatable hammer defining and trigger defining portions, said conveying means and said discharge means including actuators therefore comprising said hammer defining and trigger defining portions, respectively.

7. The combination of claim 6 wherein said body includes a hand grip defining portion, said jet discharge means including a flexible resilient bladder housed within said hand grip defining portion, said trigger defining portion including an integral arm portion disposed within said body and engaged with said bladder for at least partially collapsing the latter in response to pivotal movement of said trigger defining portion in one direction.

8. The combination of claim 7 wherein said bladder includes an air discharge tube having an outlet end,

said body defining an inner wall portion closing the inner end of said longitudinal bore in said barrel and having a small diameter bore formed therethrough, the side of said inner wall portion remote from the inner end of said longitudinal bore including an outwardly projecting neck through which said small diameter bore opens, the outlet end of said discharge tube being secured to said neck.

9. The combination of claim 8 wherein said discharge tube includes a one way check valve therein, said bladder including an air inlet opening formed therein having a one way check valve operatively associated therewith.

10. The combination of claim 8 wherein said body includes an air inlet opening opening into the inner end of said bore, said air inlet opening being of a small diameter in relation to the diameter of said longitudinal bore and operable to supply intake air to said bladder through said small diameter bore upon expansion of said bladder after having been partially collapsed.

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