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BUBBLE GUN

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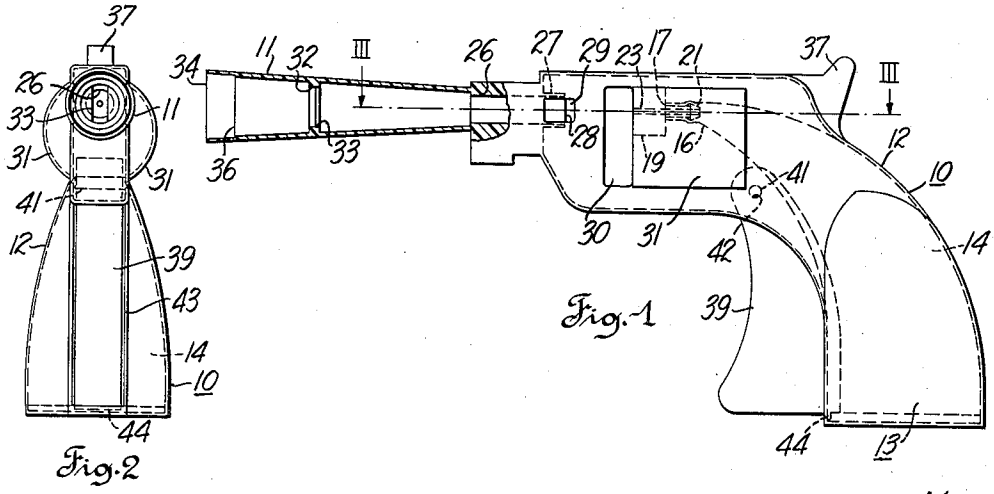


Fig.1

Fig.2

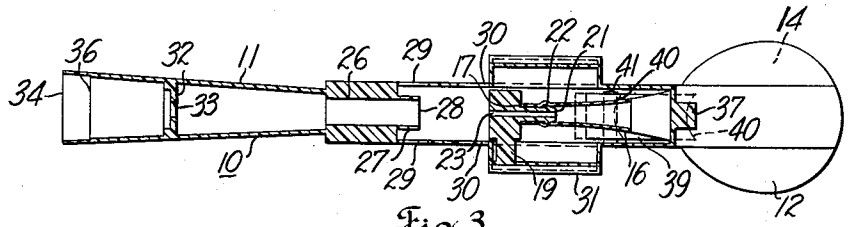


Fig.3

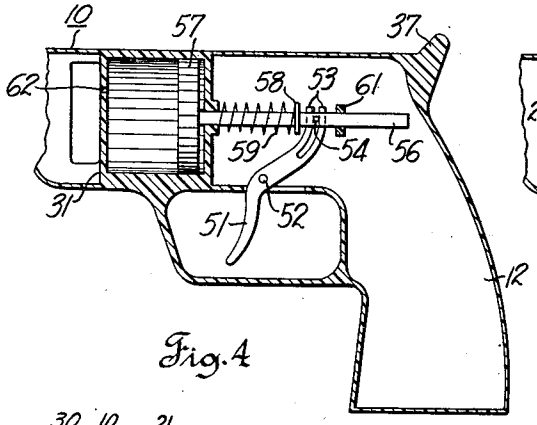


Fig.4

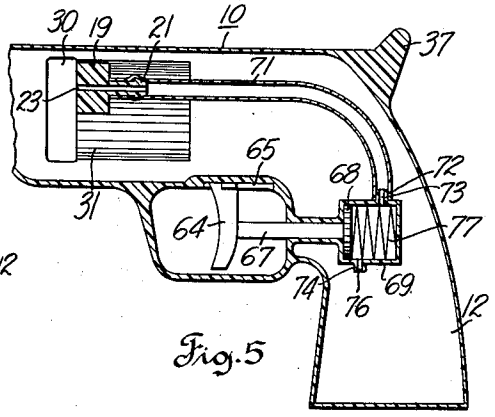


Fig.5

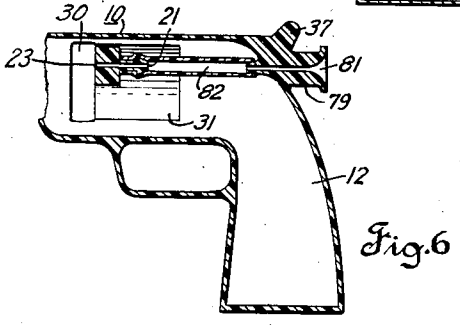


Fig.6

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BUBBLE GUN

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5 Claims. (Cl. 46—6)

This invention relates to a toy gun and more particularly to a gun for forming a succession of bubbles.

An article that produces bubbles has always been a popular toy. In practice the toy is usually dipped in a soapy or oily solution so as to form a film on one end. A pressure producing means is utilized at the other end of the toy to subject the film to air under pressure for forming the bubble. The air pressure may be created by various means, such as using the other end of the toy as a mouthpiece and blowing into it, or by mounting a squeezable attachment at the other end which can be squeezed by hand to create the air pressure. It is desirable when using this toy to form a repeating succession of bubbles after a single dip of the one end to create the oily film. However, too much pressure or an unbalanced presentation of the pressure to the film will break the film, necessitating dipping the toy again to create a new film to blow bubbles.

Accordingly, it is an object of the present invention to provide a toy which will repeatedly form bubbles following the single application of an oily film.

Another object of the present invention is to provide a toy gun for the formation of any oily film at one end thereof and a pressure producing means at the other end thereof to repeatedly form bubbles from a single creation of an oily film.

A further object of the present invention is to provide a toy gun having a mouthpiece for introducing air under pressure at one end and the formation of an oily film at the other end with the air under pressure being treated to repeatedly form bubbles when a film has been initially created.

Still another object of the present invention is to provide a toy gun for the formation of an oily film at one end thereof, a pressure producing means at the other end thereof and an arrangement for treating the air under pressure to subject the oily film to an even pressure to maintain the film unbroken to repeatedly form bubbles.

Other objects will be apparent from the following description when read in connection with the drawings in which:

Fig. 1 is a side view partly in section of the toy gun;

Fig 2 is an end view of the toy gun shown in Fig. 1;

Fig. 3 is a section view taken along lines III—III of Fig. 1;

Fig. 4 is a section view of part of the toy gun showing a modification of the pressure producing means;

Fig. 5 is a section view of part of the toy gun showing another modification of the pressure producing means;

Fig. 6 is a section view of part of the toy gun showing a further modification of the pressure producing means.

Referring to the drawings by characters of reference, Figs. 1, 2 and 3 illustrate a toy gun **10** for making bubbles. A barrel **11** extends from one end of gun **10** and tapers outwardly to its free end. A handle **12** is attached to the other end of gun **10**, and handle **12** includes a pressure producing means **13**. As clearly seen in Fig. 1

pressure producing means **13** comprises a flexible air-filled container **14** which becomes smaller in size and terminates in an upper part **16**. A restricted opening **17** is formed in upper part **16** in line with barrel **11**.

A slug of material **19** is formed on one side of the inside of gun **10**. Slug **19** is positioned forward of the upper part **16** of container **14**. On the rear of slug **19** an extension or male member **21** is formed and the restricted opening **17** in upper part **16** functions as a female member to fit around extension **21**. An annular raised part **22** on extension **21** insures a tight fit. A restricted opening or longitudinal channel **23** extends through slug **19** and extension **21** so that air passing in or out of air-filled container **14** passes through channel **23**.

A hollow element or tube **26** is positioned longitudinally in the rear of barrel **11**. Part of tube **26**, shown as tube extension **27**, projects rearwardly beyond the rear end of barrel **11** so that a clearly cut edge **28** is formed on the rear end of tube **26**. It will be seen in Figs. 1 and 3 that tube **26** is in line with channel **23**, and a predetermined spacing exists between edge **28** and channel **23** so that air forced from channel **23** will undergo a change in pressure.

An opening **29** is formed in each side of the gun adjacent tube extension **27**. An imitation or simulated cartridge chamber **31** is formed on each side of the gun, and it will be seen in Figs. 1 and 3 that apertures **30** are formed at the front of each chamber **31**. When air is taken into squeezable container **14** through channel **23**, it will be taken in through openings **29** and apertures **30**.

Substantially midway in barrel **11** a flat member **32** is formed to obstruct the passage of air in barrel **11**. Flat member **32** is apertured to include a vertical slot **33** to allow air to pass. Between slotted member **33** and the front end **34** of barrel **11** an edge portion or ridge **36** is formed by grinding down part of the inside of barrel **11**. Ridge **36** provides an adhesive annular surface for a film to form when gun **10** is dipped in an oily solution.

All parts of gun **10** may be formed of thermoplastic material except squeezable container **14** which may be formed of flexible material, such as rubber. The gun **10** may be formed in two substantially symmetrical side parts and fastened together with squeezable container **14** inserted in handle **12** with its fitting over male member **21**. An imitation gun hammer **37** may also be formed at the rear of gun **10**. However, it should be understood that other materials and other methods of fabrication may be used to form gun **10** without departing from the spirit and scope of the present invention.

A trigger **39** is pivotally mounted in gun **10** on a pivot slug **41** which may be formed on one side of gun **10**. A hole **42** is formed in the top of trigger **39** to allow slug **41** to pass through when gun **10** is assembled with trigger **39**. A slot **43**, as shown in Fig. 2, is formed in the lower front part of handle **12** to allow trigger **39** to slide within and compress container **14**. Slot **43** terminates short of the bottom of handle **12**, and a protuberance **44** is formed on the rearward bottom edge of trigger **39** so that part of trigger **39** will always be positioned within handle **12** when protuberance **44** abuts the front part of handle **12**. Curved surfaces **40** are formed on the front and rear of trigger **39**, as seen in Fig. 3. Rear curved surface **40** allows trigger **39** to fit closely around the front part of container **14**.

In operation the barrel **11** is dipped into an oily solution. It is only necessary to dip the barrel **11** sufficiently to immerse ridge **36** to form an oily film on ridge **36**. Air is taken into container **14** through openings **29** and **30**, so that even if trigger **39** is squeezed while the gun is being dipped, no solution will be drawn into container **14**. Trigger **39** is pulled back to compress squeezable container **14** and force air through channel **23**. The

spacing between extension 27 and channel 23 allows the air forced out of channel 23 to drop in pressure. Also the sharp edge 28 helps to break up the pressure air entering tube 26. The air leaving tube 26 is confronted by flat member 32 and since the only passage therethrough is vertical slot 33, a swirling effect is imparted to the air. Although a slot at another angle could be used, it has been found that a vertical slot will provide a perfectly rounded bubble.

Due to the expansive action of the air passing through barrel 11 and the swirling effect from slot 33, the tendency of the pressure air to break the film as a bubble is formed on ridge 36 is eliminated. A single bubble will thus be formed and forced from the end 34 of barrel 11. When trigger 39 squeezes air-filled container 14, the swirling effect of slot 33 on the air will cause a rearward suction on the film to further prevent the film from breaking. From this construction and operation it will be seen that continual sqeezing of trigger 39 will form a repeating succession of bubbles from a single dip of gun 10 forming the film on ridge 36. Release of pressure on trigger 39 allows container 14 to take in air from openings 29 and apertures 30, thus forcing trigger 39 back to its normal position as shown in Fig. 1.

In Fig. 4 a modification of the pressure producing means 13 is shown. Handle 12 is substantially hollow, and a trigger 51 is pivotally mounted on a body slug 52. Trigger 51 has an upward extension which includes a forked end 53 which fits about a projection 54 mounted on a longitudinally sliding rod 56. Cartridge chamber 31 is formed as a cylinder to accommodate a piston 57 on the end of rod 56. An annular ring 58 is mounted on rod 56 so that a spring 59 can be fitted between the rear of chamber 31 and ring 58. A body projection 61 guides rod 56 and determines the most rearward position of forked end 53. When it is desired to form the bubble, gun 10 is dipped in an oily solution to form a film on ridge 36 as previously described. Trigger 51 is squeezed to compress spring 59 and push rod 56 and piston 57 forward. Air is thereupon forced through a restricted opening or channel 62 into tube 26 (not shown in Fig. 4), and the treatment of the pressure air and formation of bubbles is effected as previously described. After each squeezing operation spring 59 returns trigger 51 to its normal position.

In Fig. 5 another modification of the pressure producing means 13 is shown. Trigger 64 slides on a rail 65 and is attached to a sliding rod 67 which has a piston 68 on the other end that slides in cylinder 69. A first conduit 71 connects cylinder 69 with extension 21. Conduit 71 is fitted at one end to extension 21 in the same manner as described in connection with Figs. 1 and 3, and conduit 71 is fitted at the other end on an upper projection 72 having a channel 73 formed therein. A lower projection 74 having a channel 76 therein provides an air intake for cylinder 69, and spring 77 maintains piston 68 in its normal position. When trigger 64 is squeezed, piston 68 compresses spring 77 and forces air through conduit 71 and channel 23 to form bubbles as previously described. Release of trigger 64 allows spring 77 to return the trigger to its normal position.

A further modification of the pressure producing means is shown in Fig. 6. Handle 12 is substantially hollow and a mouthpiece 79 having a channel 81 therein is formed in the upper rear part of handle 12 in line with extension 21. A flexible hollow member 82 connects mouthpiece 79 with extension 21. When it is desired to form bubbles, air can be blown into mouthpiece 79, then through hollow member 82 and channel 23 to form bubbles as previously described.

The particular embodiments of the invention illustrated and described are to be considered illustrative only. The present invention includes such other modifications and equivalents as may readily occur to those skilled in the art, within the scope of the appended claims.

It is claimed and desired to secure by Letters Patent:

1. A toy gun for forming bubbles comprising a barrel extending from one end, said barrel tapered outwardly to its free end, a handle attached to the other end of said gun, said handle having pressure producing means included therein, said pressure producing means having a portion including a restricted opening terminating in the upper part of said gun in line with said barrel, a tube positioned longitudinally in said barrel, said tube having part thereof extending rearwardly beyond said barrel, said tube extension terminating adjacent said opening in said pressure producing means so as to leave a predetermined spacing therebetween, an aperture formed in the side of said gun adjacent the termination of said tube extension, a flat member transversely positioned in said barrel remote from the end of said tube within said barrel, said flat member having a vertical slot formed therein to allow the passage of air through said barrel, and a ridge formed around the inside of said barrel to provide adhesion for a bubble forming film, said ridge positioned between the free end of said barrel and said flat member.

2. A toy gun for forming bubbles comprising a barrel extending from one end, said barrel tapered outwardly to its free end, a handle attached to the other end of said gun, said handle having pressure producing means formed therein, said pressure producing means including a channeled mouthpiece positioned in the upper rear part of said handle, a hollow member extending forwardly from said mouthpiece and having a restricted opening formed in its forward end in line with said barrel so that air under pressure blown into said mouthpiece will be forced into said barrel, a tube positioned longitudinally in said barrel, said tube having part thereof extending rearwardly beyond said barrel, said tube extension terminating adjacent said opening in said pressure producing means so as to leave a predetermined spacing therebetween, an aperture formed in the side of said gun adjacent the termination of said tube extension, a flat member transversely positioned in said barrel remote from the end of said tube within said barrel, said flat member having a vertical slot formed therein to allow the passage of air through said barrel, and a ridge formed around the inside of said barrel to provide adhesion for a bubble forming film, said ridge positioned between the free end of said barrel and said flat member.

3. A toy gun for forming bubbles comprising a barrel extending from one end, said barrel tapered outwardly to its free end, a handle attached to the other end of said gun, said handle having a flexible air-filled container mounted therein, said container terminating at its upward portion in a restricted opening in line with said barrel, a trigger having one end pivotally mounted in said gun, said trigger operable to squeeze said flexible container to project air under pressure through said restricted opening, a tube positioned longitudinally in said barrel, said tube having part thereof extending rearwardly beyond said barrel, said tube extension terminating closely adjacent said opening in said container so as to leave a predetermined spacing therebetween, a flat member transversely positioned in said barrel remote from the end of said tube within said barrel, said flat member having a vertical slot formed therein to allow the passage of said air under pressure through said barrel, and a ridge formed around the inside of said barrel to provide adhesion for a bubble forming film, said ridge positioned between the free end of said barrel and said flat member.

4. A toy gun for forming bubbles comprising a barrel extending from one end, said barrel tapered outwardly to its free end, a handle attached to the other end of said gun, a simulated cartridge chamber formed in said gun rearwardly of said barrel, said chamber having a piston movable therethrough and a restricted opening formed in its forward end in line with said barrel, a trigger pivotally mounted in said gun and connected to said piston so that operation of said trigger forces air under pressure through

said restricted opening, a tube positioned longitudinally in said barrel, said tube having part thereof extending rearwardly beyond said barrel, said tube extension terminating closely adjacent said opening so as to leave a predetermined spacing therebetween, an aperture formed in the side of said gun adjacent the termination of said tube extension, a flat member transversely positioned in said barrel remote from the end of said tube within said barrel, said flat member having a vertical slot formed therein to allow the passage of air through said barrel, and a ridge formed around the inside of said barrel to provide adhesion for a bubble forming film, said ridge positioned between the free end of said barrel and said flat member.

5. A toy gun for forming bubbles comprising a barrel extending from one end, said barrel tapered outwardly to its free end, a handle attached to the other end of said gun, said handle including a chamber having a piston slidably mounted therein, a conduit connected to one end of said chamber and extending upward to terminate in a restricted opening in line with said barrel, a trigger having one end pivotally mounted in said gun and connected

to said piston so that operation of said trigger forces air under pressure through said conduit and said restricted opening, a tube positioned longitudinally in said barrel, said tube having part thereof extending rearwardly beyond said barrel, said tube extension terminating closely adjacent said opening in said conduit so as to leave a predetermined spacing therebetween, an aperture formed in the side of said gun adjacent the termination of said tube extension, a flat member transversely positioned in said barrel remote from the end of said tube within said barrel, said flat member having a vertical slot formed therein to allow the passage of air through said barrel, and a ridge formed around the inside of said barrel to provide adhesion for a bubble forming film, said ridge positioned between the free end of said barrel and said flat member.

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