Feb. 26, 1952 J. C. SCOTT 2,587,535

AUTOMATIC BUBBLE FORMING DEVICE

Filed Oct. 13, 1948 2 SHEETS--SHEET 1

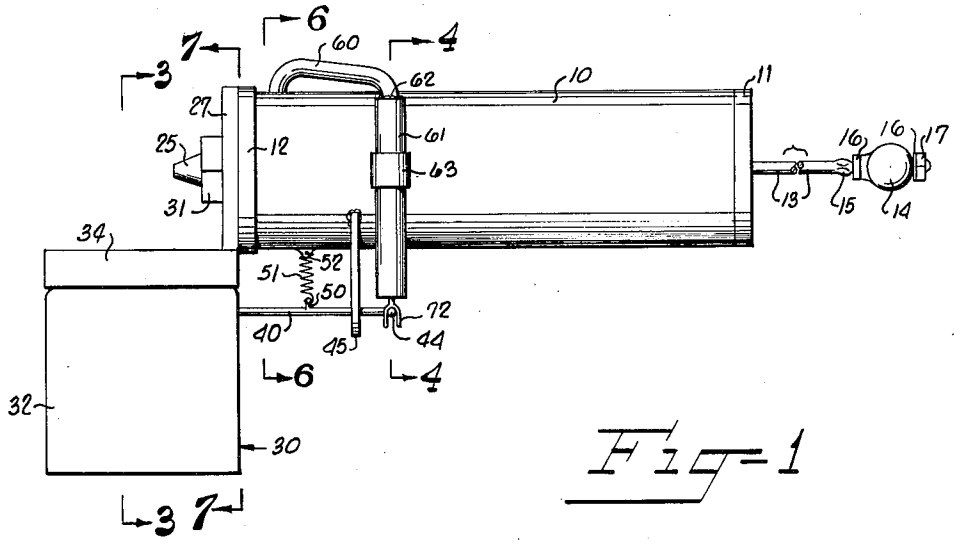


Fig-1

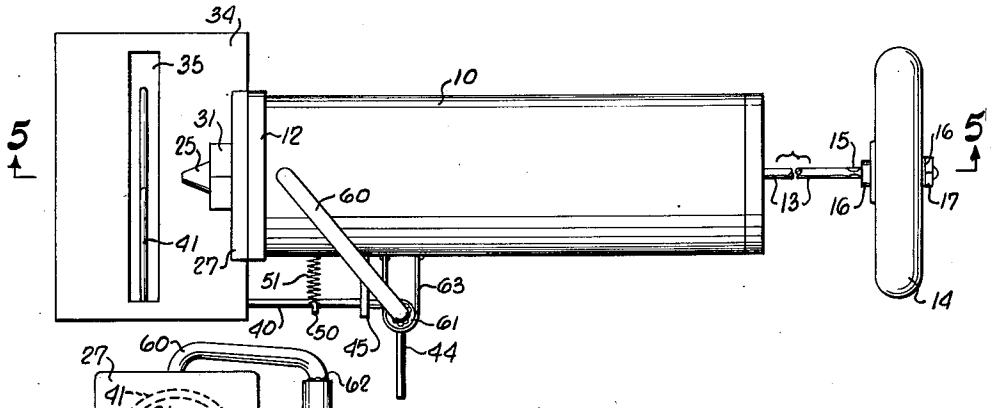


Fig-2

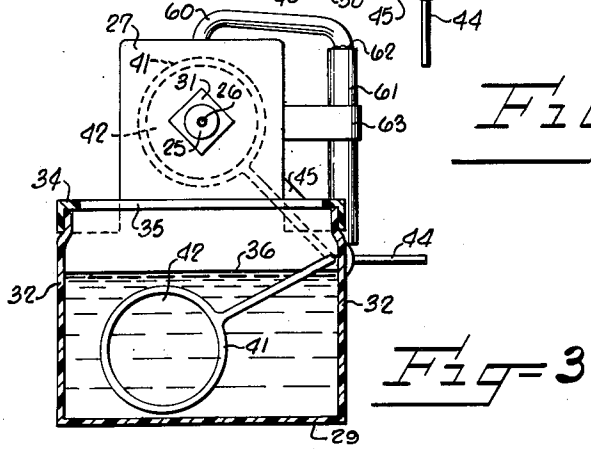


Fig-3

JOSEPH C. SCOTT,
INVENTOR.

BY

ATTORNEY.

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AUTOMATIC BUBBLE FORMING DEVICE

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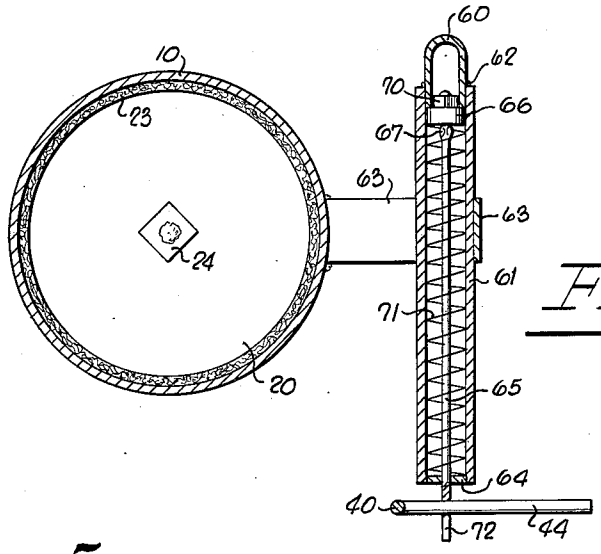


Fig-4

Fig-5

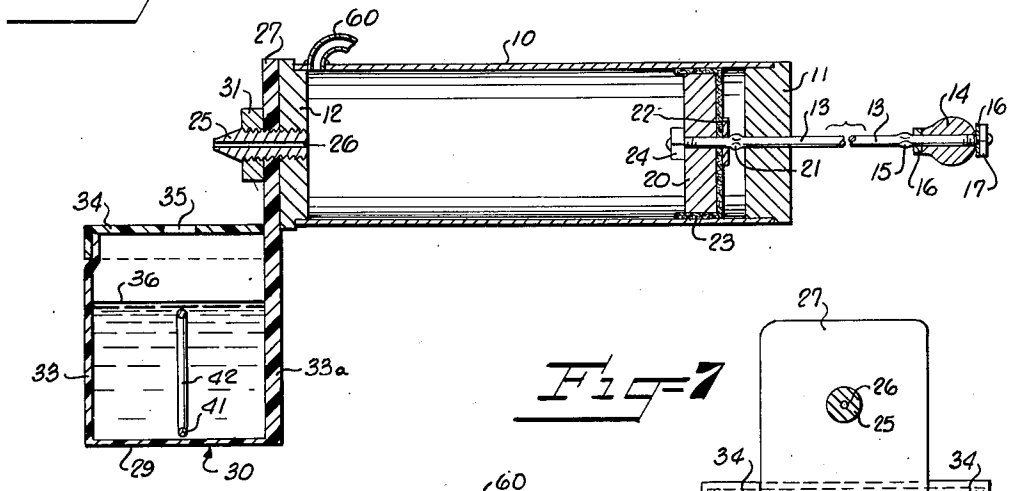
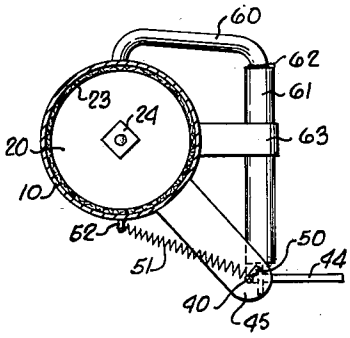


Fig-7

Fig-6



JOSEPH C. SCOTT,
INVENTOR.

BY

ATTORNEY.

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AUTOMATIC BUBBLE FORMING DEVICE

Joseph C. Scott, Charlotte, N. C.

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3 Claims. (Cl. 46—8)

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This invention relates to a bubble forming apparatus of a type comprising a manually operated air pump having a reservoir secured thereto and in which a wand is mounted for oscillation and whereby the wand is submerged in a bubble forming solution in the reservoir and is then moved out of the bubble forming solution into the path of the nozzle of the manually operated air pump and whereby the blast of air from the air pump will pass through the wand and will thus form a plurality of bubbles.

It is an object of this invention to provide a bubble forming device or apparatus of the type described and to provide automatic means whereby upon the plunger or piston of the pump being manually withdrawn away from the nozzle, the automatic means will cause the free end of the wand to be moved into the bubble forming solution and upon reverse movement of the plunger or piston in the manually operated air pump, the wand will automatically move out of the bubble forming solution and into the path of the air emitted from the nozzle of the manually operated air pump and, there being a film of the bubble forming solution on the wand, bubbles will thus be formed as the air passes through the same.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of the bubble forming device;

Figure 2 is a top plan view looking down at the top of Figure 1;

Figure 3 is a vertical sectional view taken along the line 3—3 in Figure 1;

Figure 4 is an enlarged vertical sectional view taken substantially along the line 4—4 in Figure 1;

Figure 5 is a vertical sectional view taken along the line 5—5 in Figure 2;

Figure 6 is a vertical sectional view taken along the line 6—6 in Figure 1;

Figure 7 is an elevation with parts in section and showing a portion of the reservoir broken away and is taken substantially along the line 7—7 in Figure 1.

Referring more specifically to the drawings, the numeral 10 indicates the cylinder of a suitable hand operated compressed air gun or pump and this cylinder is capped at its right-hand and left-hand ends in Figures 1, 2 and 7 as at 11 and 12, respectively.

Slidably penetrating the cap 11 is a suitable piston rod 13 having a handle 14 loosely mounted

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on the right-hand end thereof in Figures 1, 2 and 5 and the piston rod 13 is crimped as at 15 and a washer 16 is provided on each side of the handle 14 on the piston rod 13 and threadably mounted on the right-hand end of the piston rod 13 is a nut 17 to thus secure the handle 14 against the washer 16 of the piston rod 13. The left-hand end of the piston rod in Figure 5 has a piston 20 mounted thereon and this piston rod 13 is crimped as at 21, the crimped portion 21 being engaged by a suitable washer 22 and a suitable cup washer 23 being provided between the piston 20 and the washer 22, on the piston rod 13. The left-hand end of the piston rod 13 has a nut 24 threadably mounted thereon to thus secure the piston 20 and associated parts against the crimped portion 21 of the piston rod 13. The cup washer 23 is mounted for sliding movement within the cylinder 10.

The cap 12, at the left-hand end of the cylinder 10 in Figures 1, 2 and 5, has a nozzle 25 threadably mounted therein which has a longitudinally extending bore 26 therein. The nozzle 25 extends outwardly from the cap 12 and slidably penetrates an upwardly extending portion 27 of a reservoir broadly designated at 30. The nozzle 25 has a nut 31 threadably mounted on the left-hand end thereof in Figure 7 for securing the compressed air pump to the portion 27 of the reservoir 30.

The reservoir 30 may be of any desired material and is shown as being of a molded plastic material in Figure 5, and comprises side walls 32 and front and rear walls 33 and 33*a*, respectively, and a bottom 29. A cover member 34 is adapted to be pressed lightly onto the reservoir 30. The cover 34 has an elongated slot 35 therein and through which the wand to be presently described is adapted to pass. A suitable bubble forming solution 36 is provided in the reservoir 30.

Rotatably mounted in the rear wall 33*a* of the reservoir 30; that is, adjacent the discharge end of the compressed air pump is a longitudinally extending portion 40 of a wand 41 having an opening 42 therein. The longitudinally extending portion 40 of the wand 41 is bent outwardly at right angles at its free end as at 44 and the portion 40 is rotatably mounted in a bearing member 45 secured, as by welding, to the cylinder 10.

A spring perch 50 is secured, as by welding, to a medial portion of the portion 40 and has one end of a tension spring 51 connected thereto, the other end of which is connected to a spring perch

52 projecting from the cylinder 10 (Figures 1, 2 and 6). The tension spring 51 normally urges the wand 41 in a counterclockwise direction in Figure 3 and the primary object of this invention, as heretofore stated, is to automatically move the wand from the solid line position shown in Figure 3 to the dotted line position as the piston is moved from right to left in Figure 5 and as compressed air is emitted through the bore 26 in the nozzle 25 to thus automatically align the opening 42 in the wand 41 with the nozzle 25 and whereby the blast of air from the nozzle will pass through the opening in the wand 41 and, in so doing, will form a plurality of bubbles from the film forming solution that has been deposited over the opening 42 in the wand 41 when it was in the solid line position shown in Figure 3.

The cylinder 10 has a tubular member 60 extending from the top surface thereof, adjacent the discharge end of the compressed air gun, and this tubular member 60 extends outwardly and is bent downwardly and enters the upper end of a vertically disposed cylinder 61 to which it is welded as at 62 (Figure 4). The cylinder 61 is secured as by welding to a strap iron member 63 which extends inwardly and is welded to the cylinder 10 to thus rigidly support the cylinder 61. The lower end of the cylinder 61 (Figure 4) is restricted as at 64 and a piston rod 65 slidably penetrates the restricted lower end 64 of the cylinder 61. The piston rod 65 has a piston 66 loosely mounted on the upper end thereof and this piston 66 is secured against a crimped portion 67 of the piston rod 65 by a washer 70 and the rod 65 is peened over to secure the washer 70 thereon.

A compression spring 71 is disposed within the cylinder 61 and surrounds the piston rod 65. The compression spring is mounted between the restricted portion 64 of the cylinder 61 and the piston 66 to thus normally urge the same upwardly against the lower end of the tubular member 60 (Figure 4). The lower end of the piston rod 65 is forked as at 72 and this forked portion is loosely penetrated by the outwardly projecting portion 44 of the wand 41.

It is thus seen that as the piston 20 is moved from right to left in Figure 5, the air compressed thereby in the cylinder 10 will not only be emitted through the bore 26 in the nozzle 25 but will also pass through the tubular member 60 and thus to the upper end of the cylinder 61 in Figure 4.

It is evident that as the compressed air enters the upper end of the cylinder 61 the piston 66 will be forced downwardly against the compression spring 71 and this will cause the laterally extending portion 40 and the wand 41 to move in a clockwise direction in Figures 3, 4 and 6 to where the wand will be moved to the dotted line position shown in Figure 3. The wand will move to this dotted line position upon moving the piston 20 a short distance relative to the cylinder 10 and will remain in the dotted line position until the piston 20 has moved as far to the left in Figure 7 as is possible and it is thus seen that the air emitted from the nozzle 25 will pass through the opening 42 in the wand 41 thus dislodging the film of the bubble forming solution which had been deposited over the opening 42 in the wand 41, in the manner heretofore described, and to thereby form a plurality of bubbles.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being defined in the claims:

I claim:

1. A bubble forming device comprising a reservoir adapted to contain a bubble forming solution, a looped wand adapted to be oscillatably mounted in the reservoir, a manually operated compressed air gun secured to the reservoir, a nozzle in the compressed air gun for directing a blast of air adjacent the reservoir, said looped wand having a longitudinally extending portion rotatably mounted on the compressed air gun, spring means normally urging the wand into the bubble forming solution, means automatically responsive to operation of the air gun for moving the wand out of the solution and into alignment with the nozzle of the air gun whereby a film of the bubble forming solution will be deposited on the wand as it moves out of the solution and the blast of air will pass through the wand thus dislodging the film thereon and forming a plurality of bubbles, said automatic means responsive to operation of the air gun comprising a cylinder mounted on the air gun, a piston in the cylinder, spring means disposed within the cylinder and engaging the piston for normally urging the piston in one direction, a tubular member extending from one end of the cylinder to the compressed air gun, a piston rod connected to the piston and extending through the end of the cylinder opposite from the tubular member, the free end of the piston rod being engageable with the longitudinally extending portion of the wand, whereby upon operation of the air gun in a manner to emit air from the nozzle, air will also pass through the tubular member to one end of the piston cylinder, thus moving the piston in a direction opposite from the direction in which it is urged by the spring means to thus partially rotate the wand about its axis and to move the wand into alignment with the discharge end of the nozzle and whereby the air from the nozzle will pass through the looped portion of the wand to thereby form a plurality of bubbles.

2. Apparatus for forming bubbles from a film forming liquid comprising a cylinder, a piston mounted for longitudinal sliding movement in the cylinder, a piston rod connected to the cylinder and extending through one end of the same, a handle on the free end of the piston rod which is adapted to be grasped by an operator for moving the piston relative to the cylinder, a nozzle in the opposite end of the cylinder from the end through which the piston rod projects, a reservoir having an upwardly extending portion integral therewith, said upwardly extending portion being penetrated by the nozzle for securing the reservoir to the cylinder, a wand having an opening in one end thereof and having a longitudinally extending portion integral therewith, said longitudinally extending portion being rotatably mounted in the wall of the reservoir adjacent the cylinder, spring means normally holding the end of said wand having an opening therein within said reservoir, a second cylinder mounted on the outer surface of said first-named cylinder, tubular means connecting the first-named cylinder to the second cylinder, said second cylinder having a second piston mounted therein and extending therefrom, the free end of said second piston being engageable with the longitudinally extending portion of said wand, whereby manual

operation of said first-named piston rod will cause air to be discharged from said nozzle and will cause said second piston in said second cylinder to move into engagement with the longitudinally extending portion of said wand to partially rotate the same to move the open end of said wand from out of the reservoir into alinement with the nozzle in said first-named cylinder whereby air emitted from said nozzle will cause bubbles to be formed from the bubble forming solution deposited on the open end of said wand.

3. Means for forming a plurality of bubbles from a bubble forming solution comprising a manually operable compressed air pump provided with a nozzle at one end of the same through which a stream of compressed air is adapted to be forced from the compressed air pump as it is actuated, a reservoir for holding bubble forming solution secured to the end of the compressed air pump on which the nozzle is disposed, a wand having a longitudinally extending portion rotatably mounted on said compressed air pump, the free end of said wand having an opening therein and being oscillatable into and out of said reservoir, spring means normally urging the free end of said wand into said reservoir, a cylinder secured to the outer surface of the compressed air pump, a piston slidably mounted within said cylinder, means connecting said cylinder with the interior of said compressed air pump whereby actuation of said compressed air pump will cause actuation of the piston within said cylinder, the

free end of said piston being engageable with the longitudinally extending portion of the wand whereby actuation of said compressed air pump will cause said piston to partially rotate said wand to move the free end thereof into alinement with the nozzle in the end of the compressed air pump so that air emitted from said nozzle will cause bubbles to be formed from the solution deposited on the free end of said wand.

JOSEPH C. SCOTT.

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