

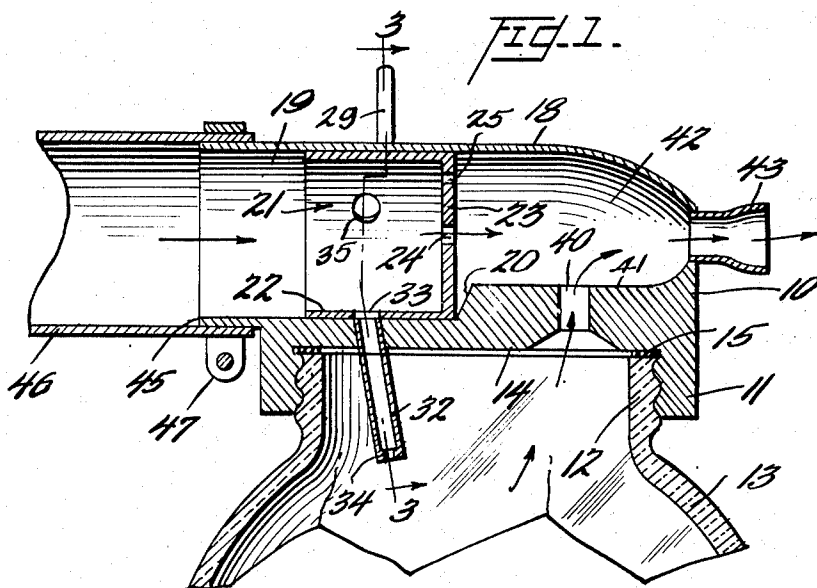
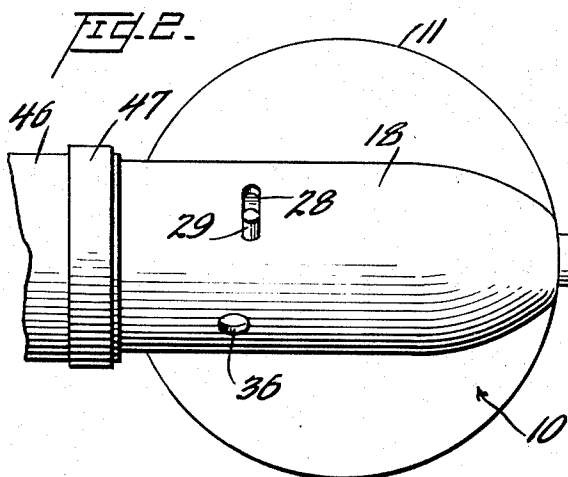
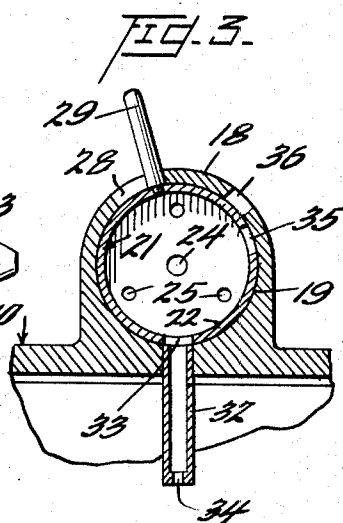
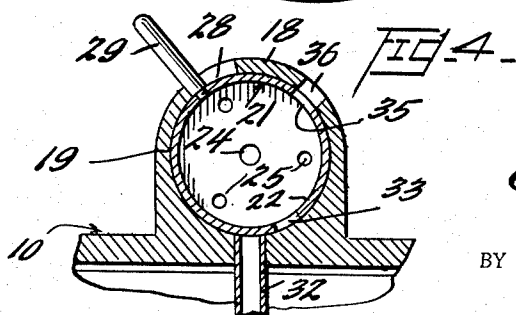
April 13, 1954

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2,675,147

FLOCK GUN

Filed April 30, 1951



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2,675,147

FLOCK GUN

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Application April 30, 1951, Serial No. 223,710

7 Claims. (Cl. 222-193)

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This invention relates to flock guns, and has particular reference to the projecting of flocculent material onto properly prepared surfaces in accordance with customary practice.

An important object of the present invention is to provide a novel type of flock gun which operates with a high degree of efficiency from a low pressure source, thus adapting the device for operation from such a source of low pressure as a conventional vacuum cleaner motor, as distinguished from the usual flock guns which require pressure sources of from twenty to sixty pounds per square inch.

A further object is to provide such a gun which is adapted for connection with an ordinary Mason fruit jar as the source of flock to be projected against the desired surfaces.

A further object is to provide a highly simplified type of flock gun which is readily controllable to determine the rate of discharge of flock from the nozzle, and wherein the low pressure acting to discharge flock from the container to the nozzle is assisted by an air jet action provided in a mixing chamber into which the flock is delivered from the container prior to its discharge through the nozzle.

Other objects and advantages of the present invention will become apparent during the course of the following description.

In the drawing, I have shown one embodiment of the invention. In this showing,

Figure 1 is an axial sectional view through the device shown attached to a portion of a conventional Mason jar and to a portion of a hose leading from a pressure source such as a vacuum cleaner,

Figure 2 is a plan view of the gun, a portion of the air hose being illustrated,

Figure 3 is a sectional view taken substantially on line 3-3 of Figure 1, showing one adjusted position of the parts for full flock discharge, and

Figure 4 is a similar view showing the parts in the completely shut-off position.

Referring to Figure 1, the numeral 10 designates the generally circular body of the device having a depending annular internally threaded flange 11 adapted to be attached to the conventional threads at the upper end of the neck 12 of a Mason jar 13. A Mason jar is merely the suggested source of flock to be projected from the gun, and it will be obvious that any type of container may be employed. Interiorly of the flange 11, the body 10 is provided with a flat bottom 14, and a washer or gasket 15 is arranged between

the bottom 14 and the upper edge of the neck 12 to seal the container 13.

The body 10 is provided with an integral raised portion 16 extending diametrically across the circular portion of the body 10. This raised portion 16 is provided therewithin with a cylindrical bore 18. This cylinder terminates at its inner end in a shoulder 20 against which is arranged a valve 21 having a cylindrical wall 22 rotatably fitting the cylinder 19 and an end wall 23. The latter wall is provided with an axial jet orifice 24 and preferably also with a plurality of circumferentially spaced orifices 25, for a purpose to be described.

At one side and preferably near the top, the wall of the cylinder 19 is provided with an arcuate slot 28 through which projects a handle 29 secured at its inner end to the valve 21. This handle permits the valve to be rocked on its axis for a purpose to be described.

An air pressure tube 32 projects through the bottom of the head or body 10 and, in the normal operation of the device, communicates at its upper end with the interior of the valve 21 through a port 33 therein. The lower end of the pressure tube 32 is restricted as at 34 to project an agitating jet of air into the flock within the container 13. At a point circumferentially spaced from the port 33, the valve 21 is provided with a discharge port 35 movable under conditions to be described into registration with a port 36 through the wall of the cylinder 19. The throw of the lever 29 moves the valve 21 from the fully open position of the port 33 in Figure 3 to the fully open position of the port 35 through the port 36 upon movement of the handle 29 in a counterclockwise direction from the position in Figure 3 to the position in Figure 4.

The bottom of the head 10 is provided with a discharge port 40 (Figure 1) preferably flared outwardly at its lower end, as shown. The port 40 extends through a thickened portion of the head 10 and the top surface 41 of such thickened portion terminates at its left hand end in Figure 1 in the shoulder 20 and forms the bottom of a mixing chamber 42 into which flock flows through the opening 40 as described below. From the mixing chamber 42, the flock is discharged through a nozzle 43 which is flattened in one direction as will be apparent from a comparison of Figures 1 and 2.

The wall of the cylinder 19 extends beyond the flange 11 as at 45 for connection with a hose 46 leading from a source of pressure. This hose has

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been shown as being clamped in position on the cylinder extension 45 by a conventional clamp 47.

Operation

The container 13 is loaded with flock, whereupon the head or body 10 is connected to the container and the hose 46 is connected to the extension 45. The gun is now ready for operation. As previously stated, the present device is particularly adapted for use with a source of relatively low pressure, such as is obtainable with a vacuum cleaner motor and blower, or other similar type of centrifugal blower. In other words, the device does not need the relatively high pressures, for example from twenty to sixty pounds per square inch, that are necessary with flock guns of conventional type.

The blower is started with the valve 21 in the position shown in Figure 4, the port 33 being entirely out of registration with the jet tube 32, in which case the larger portion of the air flowing into the cylinder 19 and the interior of the valve 21 will escape through the ports 35 and 36. Some of the air, of course, will flow through the openings 24 and 25, but this air will perform no functions under the conditions stated.

When it is desired to start the use of the gun, the operator will move the handle 29 clockwise from the position shown in Figure 4 to any extent in accordance with the desired rate of discharge of flock from the gun. For the maximum rate of discharge, the valve 21 will be turned to the position shown in Figure 3 for the full opening of the port 33 and the complete closing of the port 35. Under such conditions, air will flow into the container 13 through the restricted nozzle 34 at relatively high speed to effect constant agitation of the flock and to generate pressure in the container to effect the flow of the flock through the port 40 into the mixing chamber 42. In this chamber, air flows through ports 24 and 25 to assist in mixing the flock uniformly with the air, and the central port 24, discharging air over the top of the nozzle 40, provides some ejector action which assists in the flow of the flock from the container into the mixing chamber 42. The flock is discharged at a uniform rate through the nozzle 43. The device has been found highly effective for flock-coating any desired surface quickly and uniformly with the use of a relatively low pressure air source.

The rate of discharge of the flock is readily controlled by adjusting the valve 21. By partially turning the valve counterclockwise from the position shown in Figure 3, the port 33 can be partially closed and the port 35 partially opened, in which case a smaller proportion of the air will be projected into the container 13, some of the air escaping through the port 36 into the atmosphere. Of course, without the ports 35 and 36, the rate of supply of air into the container could be varied by adjusting the degree of opening of the port 33. However, this would tend to increase pressure within the valve 21. The result of this would be to increase back pressure to tend to overload the blower motor and to project air through ports 24 and 25 at a higher velocity than desired.

The arrangement shown prevents back pressure when the port 33 is partially closed and prevents undue velocity of movement of air through openings 24 and 25 into the chamber 42. This velocity of movement is important with relation to the adjustment of the rate of flow of air into the container 13. When such rate of flow is

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diminished, the same or an increased flow of air through ports 24 and 25 would tend to create a back pressure through port 40 and thus prevent the desired flow of flock upwardly into the mixing chamber.

I claim:

1. A flock gun comprising a head adapted for connection with a flock container and having a wall overlying the top of such container, said head being provided with a cylindrical bore connectible to a source of air pressure and an air jet opening leading from said bore into the container, a cylindrical valve in said bore rotatable on its axis and having a port movable into and out of registration with said opening, said head having a mixing chamber and said wall having an opening communicating between the container and said chamber, said valve having an end wall dividing the interior of said valve from said chamber and provided with an axial opening, said end wall being further provided with a plurality of circumferentially spaced openings to agitate the flock flowing into said chamber from the container, means rendered operable when said valve port is moved out of registration with said air jet opening for exhausting air from the interior of said valve to the atmosphere, and a nozzle connected to said head and communicating with said chamber.

2. A flock gun comprising a head adapted for connection with a flock container and having a wall overlying the top of such container, said head being provided with a cylindrical bore connectible to a source of air pressure and an air jet opening leading from said bore into the container, a cylindrical valve in said bore rotatable on its axis and having a port movable into registration with said opening, said head having an exhaust port opening to the atmosphere and said valve having a second port movable into registration with said exhaust port when said first-mentioned port is closed to said opening, said head having a mixing chamber and said wall having an opening communicating between the container and said chamber, said valve having an end wall dividing the interior of said valve from said chamber and provided with an axial opening, and a nozzle connected to said head and communicating with said chamber.

3. A flock gun comprising a head adapted for connection with a flock container and having a wall overlying the top of such container, said head being provided with a cylindrical bore connectible to a source of air pressure, an air jet pipe leading from said bore into the container, a cylindrical valve in said bore rotatable on its axis and having a port movable into registration with said pipe, said head having an exhaust port opening to the atmosphere and said valve having a second port movable into registration with said exhaust port when said first-mentioned port is closed to said pipe, said head having a mixing chamber and said wall having an opening communicating between the container and said chamber, said valve having an end wall dividing the interior of said valve from said chamber and provided with an axial opening, said end wall having circumferentially spaced openings communicating between the interior of said valve and said mixing chamber, said ports in said valve being so positioned with relation to said pipe and said exhaust port as to overlap both when said valve is in an intermediate position whereby the flow of air into the container can be adjusted without building up back pressure in said valve,

and a nozzle carried by said head and communicating with said chamber.

4. A flock gun comprising a head having a bottom wall and an annular flange depending therefrom for attachment with the top of a container, said head having an upwardly enlarged portion extending diametrically of the top of the container, one end of said enlarged portion having a cylindrical bore and being adapted for connection with an air pressure line, a valve having a cylindrical sleeve-like body mounted in said cylindrical bore, an air jet pipe extending from said bore downwardly into the container, the cylindrical body of said valve having a port movable into and out of registration with the upper end of said pipe, said enlarged portion of said head having a mixing chamber therein and said valve having an end wall dividing the interior of said valve from said chamber, said end wall having a restricted opening therethrough for the passage of air from the interior of said valve to the interior of said chamber, said bottom wall being relatively thick beneath said chamber and having an opening therethrough in the vertical plane of the opening in said end wall for the flow of flock from the container into said chamber, and a nozzle communicating with said chamber.

5. A device constructed in accordance with claim 4 wherein said opening in said end wall is axial thereof and projects a stream of air over said opening in said bottom wall to provide an ejector effect to assist in the flow of flock upwardly into said mixing chamber, said end wall being provided with other openings circumferentially spaced around the first-mentioned opening.

6. A flock gun comprising a head adapted for connection with a flock container and having a wall overlying the top of such container, said head being provided with a cylindrical bore connectible to a source of air pressure and an opening leading from said bore into the container, a cylindrical valve in said bore having a chamber therein communicating with said source of air under pressure when said cylindrical bore is connected thereto, said valve being rotatable on its axis and having a port movable into registration with said opening to permit the passage of air from said chamber and source into said flock container, said head having a mixing chamber and said wall having an opening communicating between the container and said mixing chamber, said valve having an end wall separating said valve chamber from said mixing chamber, said end wall having a restricted opening therethrough establishing communication between said valve chamber and said mixing chamber, and a nozzle connected to said head and communicating with said mixing chamber.

7. A flock gun comprising a head having a bottom wall and an annular flange depending therefrom for attachment with a top of a container, said head having an upwardly enlarged portion extending diametrically of the top of the container, one end of said enlarged portion having a cylindrical bore and being adapted for connection with an air pressure line, a valve having a cylindrical body mounted in said cylindrical bore, an air jet pipe extending from said bore downwardly into the container, the cylindrical body of said valve having a port movable into and out of registration with the upper end of said pipe, said enlarged portion of said head having a mixing chamber therein and said valve having an end wall dividing the interior of said valve from said chamber, said end wall having an opening therethrough for the passage of air from the interior of said valve to the interior of said chamber, said opening in said end wall being axial thereof and projecting a stream of air over said opening in said bottom wall to provide an ejector effect to assist in the flow of flock upwardly into said mixing chamber, said end wall being provided with other openings circumferentially spaced around the first-mentioned opening, said enlarged portion of said head having an exhaust port communicating with the atmosphere and said cylindrical body of said valve having a second port movable into communication with said exhaust port when said valve is rotated to move the first-mentioned port out of communication with said pipe, said ports and said pipe being so arranged relative to each other that said valve is movable to an intermediate position partially opening both said pipe and said exhaust port to communication to the interior of said valve to regulate the flow of air into the container without creating back pressure in said valve, said bottom wall being relatively thick beneath said chamber and having an opening therethrough in the vertical plane of the opening in said end wall for the flow of flock from the container into said chamber, and a nozzle communicating with said chamber.

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