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SPRAY GUN HAVING VALVED FLEXIBLE LINER

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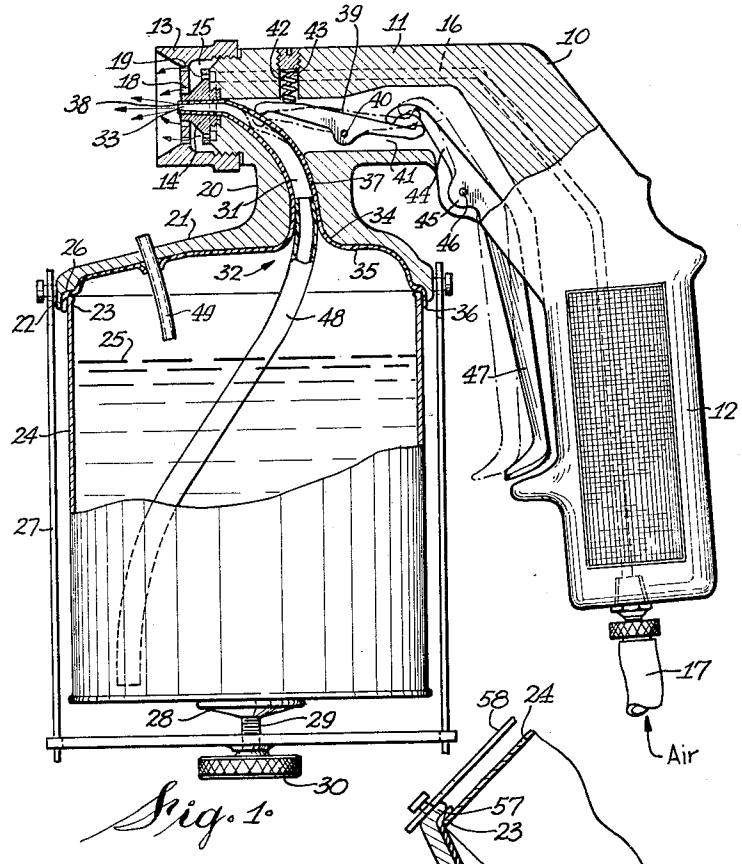

Fig. 1.

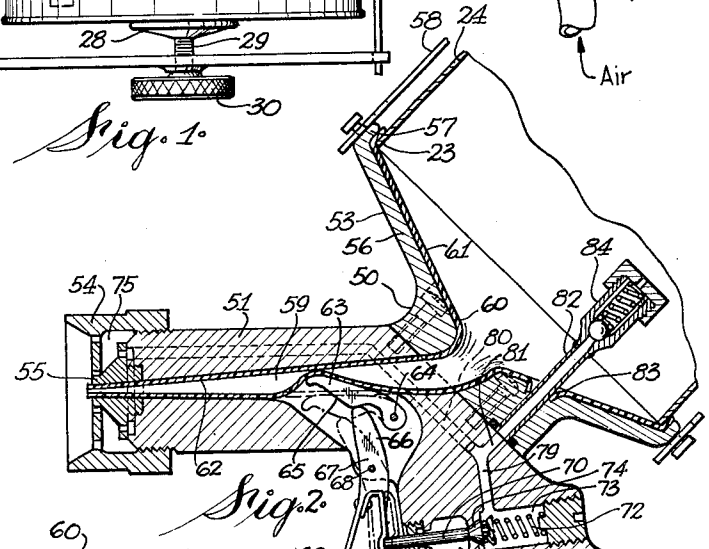

Fig. 2.

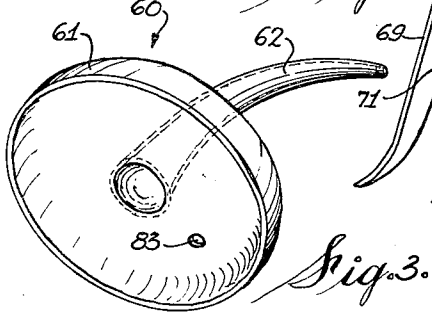

Fig. 3.

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SPRAY GUN HAVING VALVED FLEXIBLE LINER

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This invention relates to spray gun attachments.

A spray gun usually comprises a device for entraining in a stream of air flowing under pressure particles from a body of liquid in order to deposit such liquid particles in a desired location. A very common use of spray guns resides in the application of paints and other coatings to the surfaces of objects. Following each period of use for such a purpose, great care must be taken in cleaning the sprayer passages and associated parts to remove as much as possible of the adhering liquid since obviously future use of the sprayer will be impaired if any substantial deposit of hardened liquid remains in the passages and adjoining elements. The problem is much accentuated when the liquid to be sprayed is of a quick-drying paint or resinous nature. As a matter of fact, when dealing with materials of the latter type, it is substantially impossible to maintain the sprayer in desirable operating condition for any prolonged period of time.

It is an object of this invention to provide a spray gun attachment of simple, inexpensive nature and which may be employed to maintain a spray gun in satisfactory operating condition throughout the life of the parts thereof.

A more specific object is to provide a spray gun attachment which may be employed to maintain the liquid flow passages of a spray gun in clean and unobstructed condition.

The invention resides broadly in a spray gun liner comprising a unitary tubular member of flexible sheet material composed of rubber, neoprene, polyethylene, or like plastic composition, such member having a first portion of relatively large cross-sectional area and relatively short longitudinal extent and terminating in a generally circular edge of major diameter, and a second portion of relatively small cross-sectional area and relatively long longitudinal extent and terminating in a generally circular edge of minor diameter, the axis of the first circular edge being angularly disposed with respect to that of the second circular edge. The invention further resides in a spray gun structure incorporating the liner described.

The invention will be described with reference to the accompanying drawing, in which

FIGURE 1 is a sectional elevation of a spray gun having a liner in accordance with the invention associated therewith,

FIGURE 2 is a partial sectional elevation of a modified form of spray gun and liner, and

FIGURE 3 is a perspective view of the liner illustrated in FIGURE 2.

Referring to FIGURE 1, 10 is a spray gun body having a nozzle section 11 and a handle section 12, such sections being in angular relation as shown. Outer and inner nozzle members 13 and 14, of generally conventional form, are mounted on the free end of nozzle section 11 and form therebetween an air chamber 15. Air is supplied to the chamber 15 through an air passage 16 extending the body from an air supply conduit 17. Air jets flow from the chamber 15 through concentric openings 18 and 19 in the nozzle member 13.

The body 10 also has a container receiving and supporting section 20 depending from the nozzle section and having a shallow cup-shaped wall 21 terminating in a circular rim 22 for reception of the rim 23 of a can 24 containing liquid 25 to be sprayed. The rim 23 of the can is adapted to be sealingly pressed against an internal shoulder 26 surrounding rim 22 by means of a bracket 27 carried by section 20 and having a disc 28 pressed against the bottom of the can by a screw 29 and rotating head 30.

A passage 31 for liquid 25 extends through the body 10 from an inlet 32 within rim 22 to an outlet 33 in inner nozzle member 14 and axially arranged with respect to air openings 18 and 19.

In accordance with the invention, the wall 21 and liquid passage 31 are lined with a unitary liner 34 of flexible sheet material such as rubber, neoprene, polyethylene or other plastic composition material. The liner 34 has a first portion 35 of relatively large cross-sectional area and relatively short longitudinal extent and terminates in a generally circular edge 36 of major diameter. The liner 34 has a second portion 37 of relatively small cross-sectional area and relatively long longitudinal extent and terminates in a generally circular edge 38 of minor diameter. Preferably, the liner 34 is of molded form and fits closely the contour of the internal surfaces of wall 21 and passage 31. In the form shown, portion 37 has a gradually decreasing diameter towards its outlet edge 38. It will be observed that outlet edge 38 is disposed slightly outwardly of the outlet 33 in nozzle member 14 in which the end of liner portion 37 is located. It will also be observed that edge portion 36 is clamped between can rim 23 and shoulder 26.

Means for closing and opening passage 31 by collapsing and releasing a section of liner portion 37 comprises an arm 39 pivotally mounted at 40 intermediate its ends in a recess 41 in body 10. One end of arm 39 is urged by spring 42 seated in a recess 43 into collapsing relation to liner portion 37. The other end of arm 39 is engaged by an arm 44 of a lever 45 pivoted at 46 on body 10 and having a second arm 47 adjacent handle section 12 manually depressible to move the liner-engaging end of arm 39 out of collapsing position and permit liquid to flow through passage 31.

A tube 48 is provided to place the interior of liner portion 37 in communication with the bottom portion of can 24. An air inlet tube 49 leading through wall 21 and liner portion 35 provides communication with atmosphere of the space in the can above the body of liquid.

It will be apparent that the structure described, after each spraying operation, on removal of the liquid container, the liner 34 may readily be withdrawn from the gun and readily cleaned from adhering liquid. Moreover, since it will be apparent that the liner may be made at very low cost, it could if desired be discarded after use and replaced with a new one.

Referring to FIGURES 2 and 3, a somewhat modified type of spray gun is illustrated. It comprises a body 50 having a nozzle section 51, handle section 52, and container supporting section 53.

Nozzle members 54 and 55, similar to nozzle members 13 and 14 are provided.

The container supporting section is closely similar to section 20 and comprises cup-shaped wall 56 and rim 57 for reception of rim 23 of the can 24, with can clamping bracket 58. Liquid passage 59 corresponds to passage 31 and extends through body sections 53 and 51.

A liner 60 of flexible sheet material lines wall 56 and passage 59 and has portions 61 and 62 corresponding to portions 35 and 37.

Means are provided for closing and opening passage 59 by collapsing and releasing a section of liner portion 62 and comprises an arm 63 pivoted to body 50 at 64 and swingable into liner collapsing position by engagement of a cam edge surface 65 thereof by an arm 66 of a lever 67 pivotally mounted at 68 on body 50. Lever 67 also has a manually depressible arm 69 adjacent handle section 52 and which, on depression thereof, removes pressure on surface 65 of arm 63 to permit liner 60 to expand and open passage 59.

Passage 59 is in normally closed position by collapsing liner 60 by means of a plunger 70 reciprocally mounted in handle section 52 and pressed into engagement with a bracket 71 on lever arm 69 by means of a spring 72 mounted in a recess 73 and engaging head 74 of the plunger.

Air is supplied to the interior of container 24 and to nozzle chamber 75 through a passage 76 in handle section 52. Passage 76 communicates with a chamber 77 surrounding the stem portion of plunger 70. As shown, chamber 77 communicates with recess 73 through an opening 78 normally closed by plunger head 74 under the influence of spring 72. An air passage 79 leading from recess 73 has a branch 80 communicating with nozzle chamber 75 and a branch 81 communicating with a tube 82 leading through an opening 83 in liner 60 into the container 24. Tube 82 terminates in a one-way valve 84 permitting air to flow only into the container.

It will be apparent that the initial movement to manually depress lever arm 69 will, just prior to opening of liquid passage 59, move plunger 70 from its seat and initiate air flow through passages 76 and 80 to the nozzle (and to the container) whereby, when passage 59 is opened by further depressing movement of lever arm 69, the liquid flowing through open passage 59 will immediately be entrained by the stream of air flowing through the nozzle.

I claim:

1. A spray gun comprising a body having a nozzle section, a handle section, a liquid container-supporting section, and a liquid passage extending through said nozzle and container-supporting sections, said passage having a relatively short section of relatively great cross-sectional area in said container-supporting section and a relatively long section of relatively small cross-sectional area in said nozzle section, a unitary liner of flexible sheet material lining said liquid passage from end to end thereof and conforming to the contours of said passage, said container-supporting section having an annular edge portion constituting the mouth of said passage, said edge portion having an internal annular shoulder, said liner having an end portion overlying said shoulder, and a container-holding bracket carried by said container-supporting section and having a threaded member actuable to exert clamping pressure on said liner end portion and shoulder to retain said liner in position, said liner being otherwise unattached to said container-supporting section to permit withdrawal therefrom, an arm pivotally mounted in said body and engaging the exterior surface of said relatively long section of said liner, a spring imposing pressure on said arm to collapse said liner and close said liquid passage, and a manually operable lever mounted on said body and engaging said arm to move said arm against the action of said spring and out of collapsing engagement with said liner.

2. A spray gun comprising a body having a nozzle section, a handle section, a liquid container supporting section, and a liquid passage extending through said nozzle and container-supporting sections, said passage having a relatively short section of relatively great cross-sectional area in said container-supporting section and a relatively long section of relatively small cross-sectional area in said nozzle section, a unitary liner of flexible sheet material lining said liquid passage from end to end thereof and conforming to the contours of said passage, said container-supporting section having an annular edge portion constituting the mouth of said passage, said edge portion having an internal annular shoulder, said liner having an end portion overlying said shoulder, and a container-holding bracket carried by said container-supporting section and having a threaded member actuable to exert clamping pressure on said liner end portion and shoulder to retain said liner in position, said liner being otherwise unattached to said container-supporting section to permit withdrawal therefrom, an arm pivotally mounted in said body and engaging the exterior surface of said relatively long section of said liner, a lever pivotally mounted in said body and having one arm engaging said first arm to move said first arm into liner-collapsing position and a manually-depressible second arm, and a spring acting on said lever second arm to urge said first arm into liner-collapsing position.

3. A spray gun as defined in claim 2, including air supply means comprising a plunger reciprocally mounted in said body and having an end engaging said lever second arm and a head engaged by said spring, said body having a seat engaged by said plunger head in the liner-collapsed position of said first arm, said body having an air passage leading through said handle and nozzle sections, said plunger head being disposed in said air passage to interrupt it in the seated position of said plunger head.

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