June 13, 1950 K. C. THOMPSON 2,511,420

FOAM FORMING DEVICE

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Fig. 1.

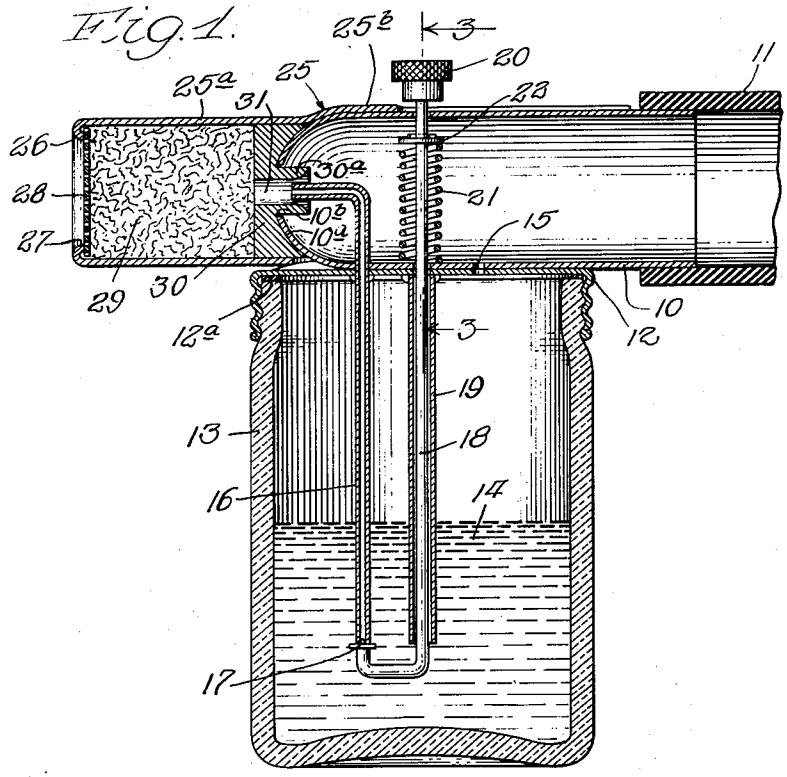
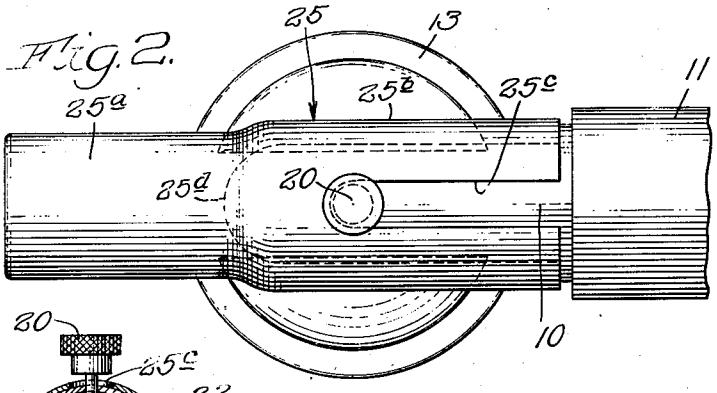


Fig. 2.



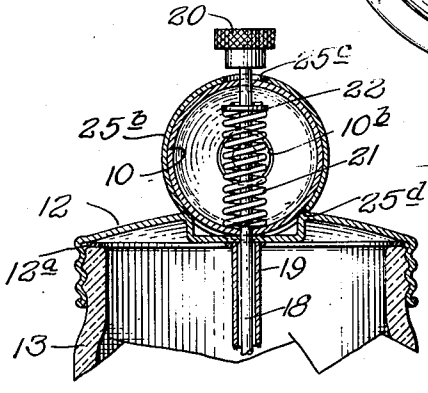


Fig. 3.

Inventor:
Kenneth C. Thompson,
By Chatton, Schroeder,
Merriam, Hoffman, Attys.

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FOAM FORMING DEVICE

Kenneth C. Thompson, Chicago, Ill.

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3 Claims. (Cl. 299—89)

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This invention relates to a foam forming device, and more particularly to a foam forming attachment for a spray gun.

A commonly used type of spray gun comprises a body member which is adapted to be secured to a hose connected to the pressure side of a vacuum cleaner. A liquid container is carried by the tubular member and is open to pressure from the vacuum cleaner hose, and the tubular member terminates in a nozzle portion having an opening for air and liquid delivery means which extend from said container. Such a spray gun is designed for use in spraying soap solutions, insecticides, etc.

While attempts have been made in the past to devise a foam forming device adapted to be attached to such a spray gun, such foam forming devices have comprised unduly complex structures involving relatively high material and manufacturing costs. For example, several such prior art devices have utilized a tubular member adapted to be attached to the outlet of the spray gun, said tubular member having therein a plurality of spaced screens through which fluid is forced to form a foam or lather. The expense of the materials and the high manufacturing cost caused by the requirement of mounting the screens and spacer members within the tubular member have rendered such devices impractical from a commercial standpoint.

I have devised and am herewith disclosing and claiming an improved foam forming attachment for a spray gun. My novel foam forming device is adapted readily to be mounted upon and removed from a spray gun and comprises a very simply and economically manufactured device wherein a mass of fibrous material is utilized to form a foam or lather. The fibrous material may be positioned in a tubular member by means of a simple manufacturing operation as compared to the complexity of mounting screens and spacers, and such fibrous material comprises an efficient means of producing a large supply of foam or lather which has many desirable uses, as for example in cleaning rugs or upholstered furniture. In addition, my improved foam forming device is small in size and light in weight so that it may be handled with ease.

Other features and advantages of this invention will be apparent from the following specification and from the drawings in which:

Fig. 1 is a vertical section through a spray gun having a foam forming device constructed in accordance with my invention mounted thereon;

Fig. 2 is a top plan view of the apparatus shown in Fig. 1; and

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Fig. 3 is a fragmentary transverse vertical section along the line 3—3 of Fig. 1.

Referring more particularly to the drawings, the spray gun comprises a body member 10 which, as illustrated, has a circular transverse cross section and which is adapted to be secured by friction means or otherwise to the open end of a hose 11 which extends from a source of pressure, as from the pressure side of a conventional domestic vacuum cleaner.

The other end of the body member 10 is turned inwardly to form a nozzle 10*a* which terminates in an opening 10*b*, through which air under pressure emerges from the nozzle.

Attached to the underside of the body member 10 (as the parts appear in Fig. 1) is a threaded cap 12, and a container 13 having a threaded top is carried by the cap 12, a gasket 12*a* providing a seal between the members 12 and 13. The container 13 can be of any suitable material, but conventionally is formed of glass or other transparent material, and is utilized for holding a supply of liquid, as for example a soap solution 14. An opening 15 through the body member 10 and the cap 12 admits air under pressure above the liquid 14 forcing said liquid up through a liquid delivery means comprising a small pipe 16 which extends from a point near the bottom of the container 13 upwardly through the cap 12 and into the body member 10 where the liquid delivery means turns at a right angle and terminates at a position coaxial with and slightly behind (speaking with respect to the direction of air flow) the air opening 10*b*. As is well understood in the art, the flow of air through the opening 10*b* breaks the solid stream of liquid from the liquid delivery means into a spray.

While obviously both ends of the liquid delivery pipe 16 must be open during the operation of the spray gun, selectively operable means are provided for closing the lower end of the pipe 16 as desired. This means comprises a valve member 17 mounted on the lower end of an "L-shaped" stem 18 which extends upwardly through a guide tube 19 and terminates in an actuating knob 20 spaced above the top of the body member 10. A compression spring 21 surrounds a portion of the stem 18 within the body member 10 and reacts against the bottom of the body member 10 and a stop collar 22 on the stem 18 so that the valve member 17 normally is seated in the lower end of the liquid delivery pipe 16 and seals said pipe. By pressing the knob 20 to overcome the resistance of the spring 21, the valve member 17 is moved away from the lower end of the pipe so that liquid may pass up through said pipe.

The foam forming device is designed to be readily attached to and removed from the spray gun above described. The foam forming device comprises a tubular member designated generally at 25, one portion 25*a* of which is of no greater, and preferably of slightly smaller, outer diameter than the outer diameter of the spray gun body member 10, and another portion 25*b* of which is enlarged so that the inner diameter of the portion 25*b* is the same as the outer diameter of the spray gun body member 10. In mounting the foam forming device on the spray gun the portion 25*b* of the tubular member 25 may be slipped over the body member 10, the tubular member 25 being secured by friction means to the body member 10. In order to permit the member 25 to be properly mounted, said member has a slot 25*c* which the shaft 18 and the lower portion of the actuating knob 20 may enter, and the member 25 has an opposite larger slot 25*d* to bypass that portion of the body member 10 which is secured to the cover 12.

The member 25 terminates at its smaller end in an inwardly turned flange 26 which defines an outlet opening 27 through which the foam or lather formed by the device may pass. A foraminous member 28, preferably of non-corrosive material (as an aluminum disk) is mounted within the member 25 adjacent the outlet opening, and a mass of non-corrosive fibrous material 29, as for example stainless steel wool, is packed within the tubular member 25, the foraminous member 28 restraining said mass from entering the outlet opening 27. If desired, the foraminous member 28 may be omitted, and if a preformed cartridge of non-corrosive knit net mesh material is used, the inwardly turned flange 26 will restrain such material from entering the outlet opening 27.

A packing member 30 which is formed of a non-corrosive material, as aluminum, and is preferably slightly tapered so that the diameter of its right-hand or rear end is slightly oversize with respect to the inner diameter of the portion 25*a* of the tubular member 25, is forced into the tubular member 25 behind the fibrous material 29, the member 30 being frictionally held within the tubular member. The forward portion of the member 30 which faces the nozzle 10*a* is given a concave formation complementary to the formation of said nozzle so that it engages the nozzle over a substantial area adjacent the air opening 10*b* in said nozzle.

The packing member 30 has an extending portion 30*a* which is of substantially the same diameter as the air opening 10*b*, said extending portion preferably being slightly tapered to permit easier entry into said air opening. A flared inlet opening 31 extends through the packing member 30 and the extending portion 30*a*, and this opening is coaxial with and of larger diameter than the liquid delivery means, the liquid delivery pipe 16 extending into the mouth of this opening 31. Since the opening 31 is oversized with respect to the liquid delivery means, air from the body member 10 is forced into the opening 31 along with liquid from the liquid delivery means to form a spray, and the passage of this spray through the fibrous material 29 under the spray gun pressure forms a foam or lather which emerges from the outlet opening 27.

In the particular apparatus illustrated, the spray gun is of a common commercially obtainable type, and for this particular gun the tubular member 25 should have a diameter of about 3½ inches. However, the apparatus would be similar for use with any similar commercially obtainable type of spray guns, the face of the packing member 30 being modified to conform to the nozzle portion of any spray gun.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. A foam forming attachment for a spray gun having a nozzle with an opening for air and liquid delivery means coaxial with said opening, comprising: a tubular member constructed to be secured by friction means to the nozzle of said spray gun, said tubular member having an outlet opening at one end thereof; a mass of fibrous material within said tubular member, said member having means adjacent said outlet opening for restraining said mass from being forced through said outlet opening; and a packing member within said tubular member, said packing member being formed to engage the outer surface of said nozzle over a substantial area adjacent the air opening in said nozzle and having an extending portion adapted to enter said air opening in said nozzle, said extending portion and packing member having an inlet opening therethrough coaxial with and of larger diameter than said liquid delivery means.

2. A foam forming attachment for a spray gun having a nozzle with an opening for air and liquid delivery means coaxial with said opening, comprising: a tubular member adapted to be secured by friction means to the nozzle of said spray gun, said member having an inwardly turned flange at one end defining an outlet opening; a mass of non-corrosive fibrous material within said tubular member, said flange restraining said mass from being forced through said outlet opening; and a packing member frictionally held within said tubular member, said packing member being formed to engage said nozzle over a substantial area adjacent the air opening in said nozzle and having an extending portion adapted to enter said air opening in said nozzle, said extending portion having substantially the same outer diameter as the diameter of said air opening, and said extending portion and said packing member having an inlet opening therethrough coaxial with and of larger diameter than said liquid delivery means to provide an air space therearound.

3. A foam forming attachment for a spray gun having a nozzle with an opening for air and a liquid delivery means coaxial with said opening, comprising: a tubular member securable to said nozzle and having an outlet opening at one end thereof; a mass of finely-divided material within said tubular member adjacent said outlet opening; means on said tubular member for restraining said mass from being forced through said outlet opening; and a packing member frictionally held within said tubular member, said packing member being formed to engage the outer surface of said nozzle over a substantial area adjacent the air opening in said nozzle and having an extending portion that is slightly tapered from the packing member to the inner end of said portion adapted to enter said air opening in said nozzle, said extending portion having a base diameter substantially equal to the diameter of said air opening and having an inlet opening

which extends through the packing member and the extending portion and is coaxial with and of larger diameter than said liquid delivery means.

KENNETH C. THOMPSON.

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