

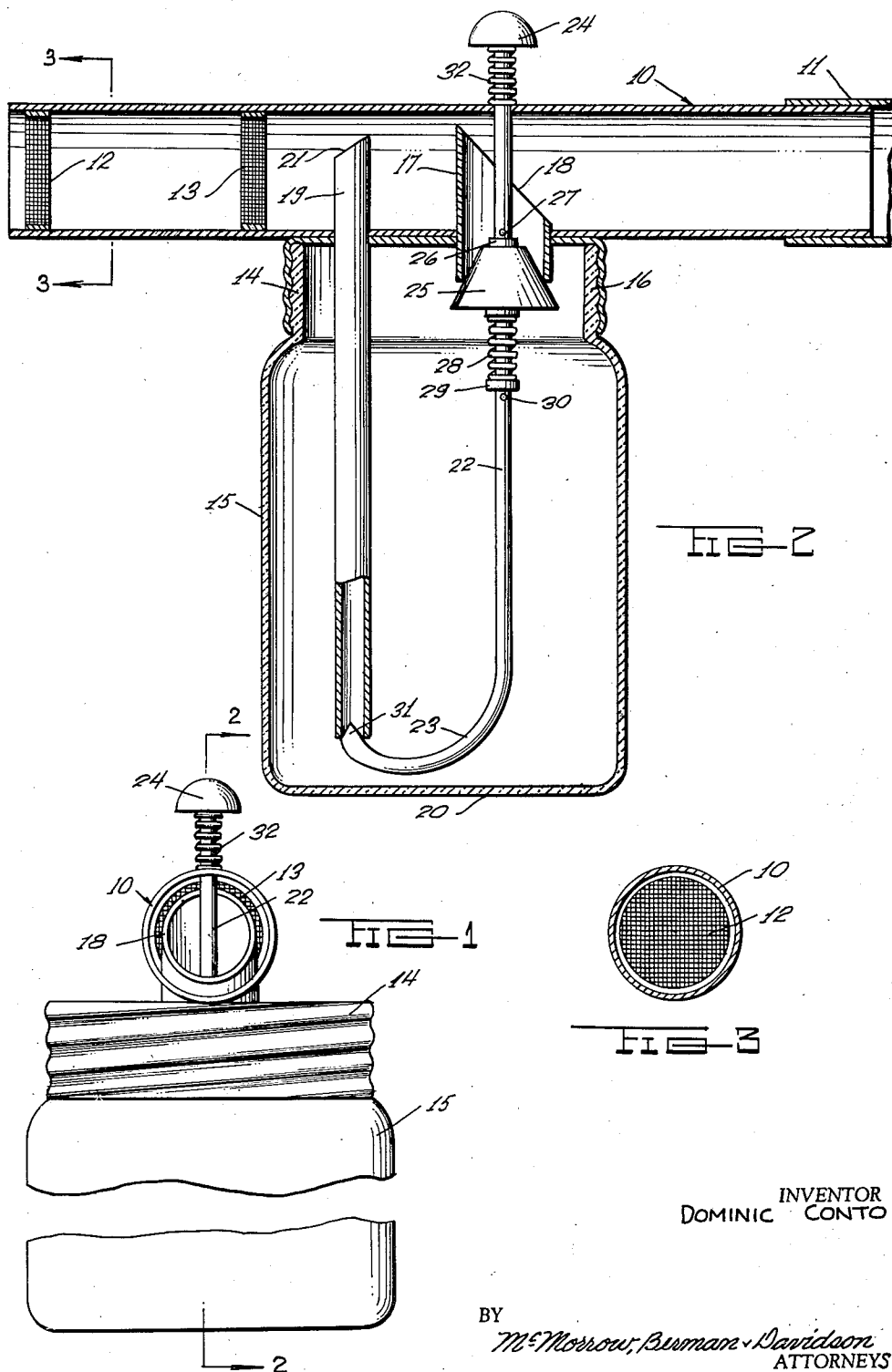
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FOAM GENERATING APPARATUS

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FOAM GENERATING APPARATUS

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2 Claims. (Cl. 261-76)

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This invention relates to foam-generating apparatus, and more particularly to portable apparatus for attachment to existing air-compressing means, such as a vacuum cleaner.

It is among the objects of the invention to provide improved foam-generating apparatus which is fully portable for hand use in cleaning walls, floors, rugs, upholstery and drapes, and can be attached to a conventional vacuum cleaner for operation, which produces an extremely dry foam containing up to 90-percent of air to prevent unduly wetting the fabric material being cleaned, which will contain an adequate supply of foam-producing material for the usual cleaning operations of the character indicated, and which is simple and durable in construction, economical to manufacture, and easy to use.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawing, wherein:

Figure 1 is a front elevation of a foam-generating device illustrative of the invention;

Figure 2 is a cross-section on the line 2-2 of Figure 1; and

Figure 3 is a cross-section on the line 3-3 of Figure 2.

With continued reference to the drawing, the improved foam-generating device or apparatus comprises an elongated, tubular nozzle 10 of substantially uniform diameter throughout its length, and of a size to receive at one end the outer or free end of a vacuum cleaner hose 11 through which compressed air is supplied to the nozzle, a filter 12 secured in the nozzle adjacent its opposite end, a second filter 13 secured in the nozzle in spaced relationship to the filter 12, a screw cap 14 secured to the nozzle intermediate the length thereof, and a container 15 having a screw-threaded neck 16 threaded into the screw cap 14 and by means of which the container is removably secured to the screw cap and the nozzle.

The first tube 17 extends through registering apertures in the side wall of the nozzle 10 and in the end wall of the screw cap 14, substantially perpendicular to the nozzle and the screw cap and communicates, at one end, with the interior of the nozzle and at its opposite end with the interior of the container 15. This tube has its end within the nozzle cut away at an angle of approximately 45-degrees, as indicated at 18, which cut-away portion faces the end of the nozzle to which the air conduit 11 is attached to constitute the tube 17 an air-deflecting tube for deflecting air from the nozzle into the container. The end

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of the tube 17 within the container terminates adjacent the screw cap 14, so that air deflected by this tube into the container will be above any liquid foam-producing material in the container when the device is held in operative position with the nozzle at the top and the container 15 suspended therefrom.

A second tube 19, extends through registering apertures in the side wall of the tubular nozzle and in the end wall of the cap 14 substantially perpendicular to the nozzle and the cap end wall, and is disposed to the rear of the tube 17 in the direction of air-flow through the nozzle. This second tube 19 communicates at one end with the interior of the nozzle 10, and at its other end with the interior of the container 15 at a location adjacent the bottom end wall 20 of the container remote from the cap 14. The end of the tube 19 within the nozzle is cut away at an angle less than 45-degrees, as indicated at 21, and this cut-away end of the tube 19 faces away from the end of the nozzle attached to the air conduit 11, so that air flowing through the nozzle will tend to produce a suction at this end of the tube 19 to assist in drawing foam-producing material from the container 15 into the nozzle 10.

An elongated valve stem 22 extends co-axially through the tube 17 and diametrically through the nozzle 10 and is provided, at its end within the container 15, with a curved portion 23 which brings this end of the stem opposite the end of the tube 19 within the container 15.

A hand knob 24 is secured on the end of the valve stem 22 at the side of the nozzle opposite the tube 17 and the container 15, and a valve piston 25 is mounted on the valve stem at the end of the tube 17 disposed within the container. The piston 25 is slidable on the valve stem and is held in operative position against an abutment collar 26, secured against movement longitudinally of the stem by the transversely-extending pin 27, by a compression spring 28 which surrounds the stem between the side of the piston 25 remote from the tube 17 and a spring abutment collar 29 secured in position on the stem by a transverse pin 30. A conical-shaped valve head 31 is provided at the end of the valve stem opposite the adjacent end of the tube 19.

A compression spring 32 surrounds the valve stem between the nozzle 10 and the hand knob 24 and resiliently urges the valve stem in a direction such that the piston 25 closes the tube 17, and the valve head 31 simultaneously closes the tube 19. The tubes 17 and 19 are opened by manual pressure on the hand knob 24.

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The spring 28 permits a slight amount of resiliently-resisted movement of the valve piston 25 relative to the stem 22, so that the valve head 31 can be brought into closing engagement with the adjacent end of the tube 19 while the piston 25 is in closing engagement with the adjacent end of the tube 17, the spring 32 being stronger than the spring 28, so that it is able to slightly compress the spring 28.

The nozzle 10 may be a piece of stock metal tubing of the proper diameter, preferably of a corrosion-resisting metal, and the cap 14 and the container 15 may be a conventional canning or preserving jar and a screw top therefor. The filters 12 and 13 are circular discs of suitable foraminous material, such as wire mesh, secured in encircling metal rings which rings are soldered or otherwise suitably secured in proper position in the tubular nozzle. The device is thus extremely economical to manufacture from readily-available materials.

In operation, with the vacuum cleaner in operation to supply aid under pressure through the hose 11 to the nozzle 10, the hand knob 24 is depressed against the force of spring 32 moving the piston 25 away from the tube 17, and the valve head 31 away from the tube 19. Air will then be deflected through the tube 17 into the upper end of the container and will force some of the foam-producing liquid in the container upwardly through the tube 19 into the nozzle 10 where this material will be impacted by air flowing through the nozzle and driven against the filter 13. As the foam-producing material is blown through the filter 13, it is mixed with air and produces foam at the downstream side of this filter. This foam is then blown through the filter 12 and mixed with additional air so that an extremely dry foam is produced at the downstream side of the filter 12, and directed onto the material to be cleaned or into some other container from which the foam can be applied to the material to be cleaned by some suitable means, such as a brush.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. An apparatus for generating foam comprising a tubular nozzle adapted to be connected at one end to a compressed air conduit, a closure member carried by the nozzle, a container removably secured to said closure member, a first tube extending perpendicularly through the side wall of said nozzle and through the closure member, said tube communicating with the interior of the container and having its end within the

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nozzle obliquely terminated and forming a baffle facing the end of the nozzle connectable with the compressed air conduit, whereby the air entering the nozzle is directed through the tube into the container, a second tube perpendicularly arranged in the nozzle and the container and extending into the container below the first tube, said second tube having its end within the nozzle angularly cut away and facing the discharge end of the nozzle, a stem slidably disposed transversely through the nozzle and disposed through the first tube, an angular bend on the lower end of the stem, said bend terminating in a valve head positionable in the lower end of the second tube, a piston slidably mounted for limited movement on the stem and means for urging said piston into seated engagement of the lower end of the first tube, an enlarged head on the outer end of the stem, spring means on said stem between the nozzle and head for urging the valve head into seated engagement of the second tube and means on said stem for disengaging the piston from the first tube upon inward movement of the stem.

2. An apparatus for generating foam comprising a tubular nozzle adapted to be connected at one end to a compressed air conduit, a closure member carried by the nozzle, a container removably secured to said closure member, a first tube extending perpendicularly through the side wall of said nozzle and through the closure member, said tube communicating with the interior of the container, a second tube perpendicularly arranged in the nozzle and the container and extending into the container below the first tube, a stem slidably disposed transversely through the nozzle and disposed coaxially through the first tube, an angular bend on the lower end of the stem, said bend terminating in a valve head positionable in the lower end of the second tube, a piston slidably mounted for limited movement on the stem, resilient means on said stem for urging said piston into seated engagement of the lower end of the first tube, an enlarged head on the outer end of the stem, spring means on said stem between the nozzle and head for urging the valve head into seated engagement of the second tube and means on said stem for disengaging the piston from the first tube upon inward movement of the stem.

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