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3,075,540

FOAM DISPENSING ATTACHMENT FOR SCRUBBING MACHINES

Filed May 22, 1961

3 Sheets-Sheet 1

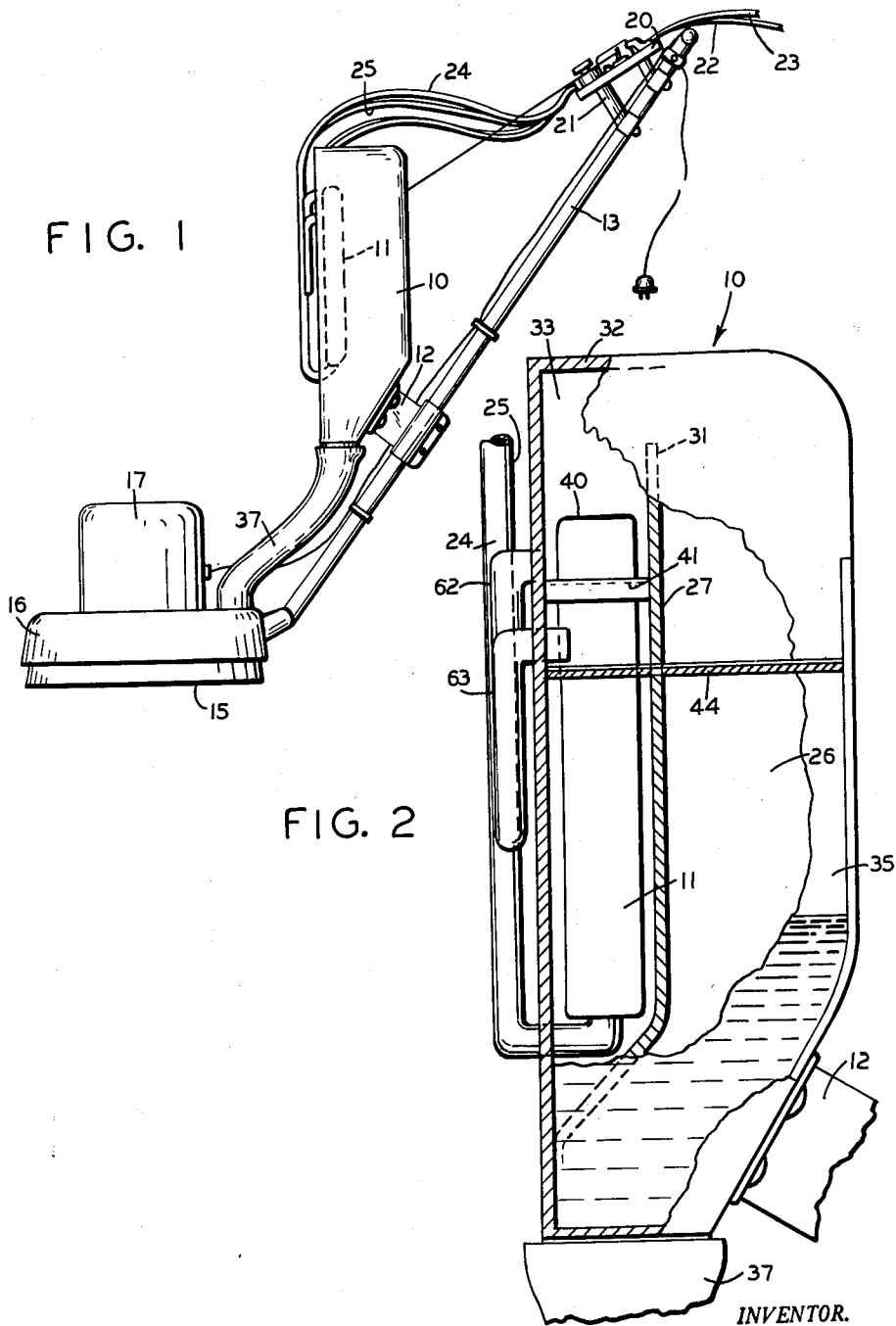


FIG. 2

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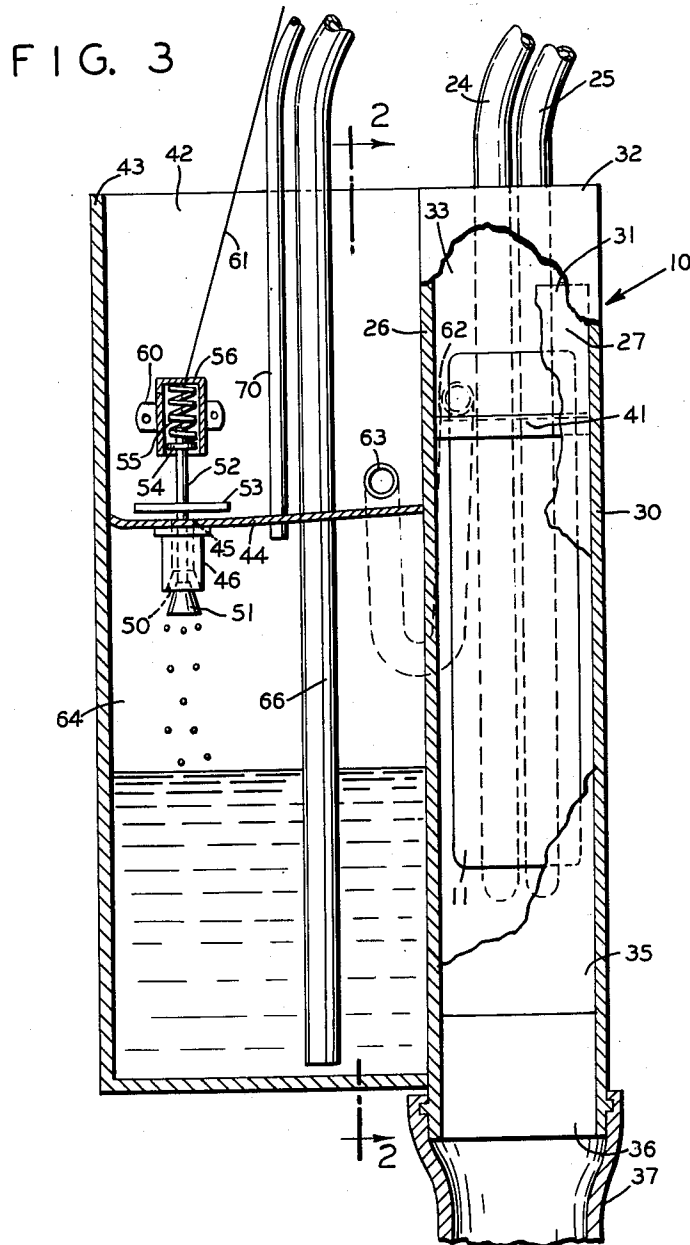
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FIG. 4

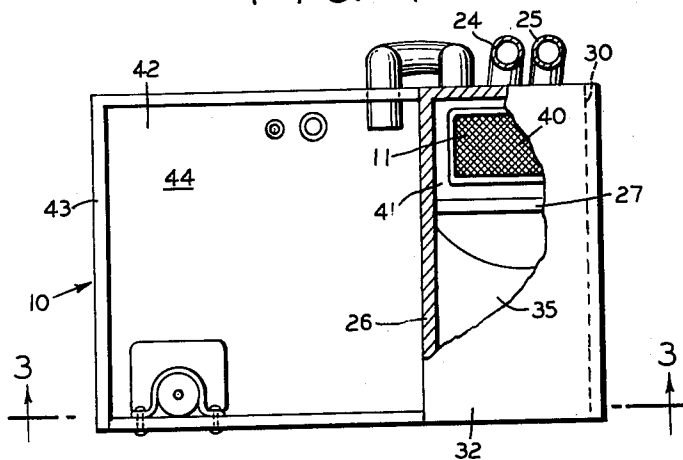


FIG. 5

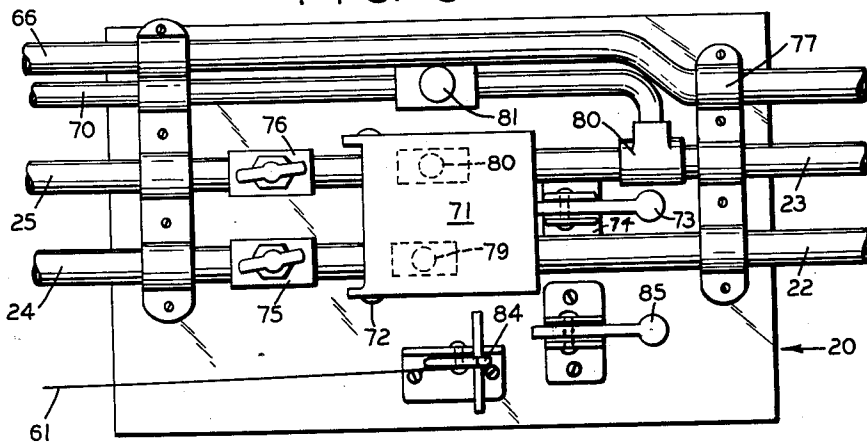
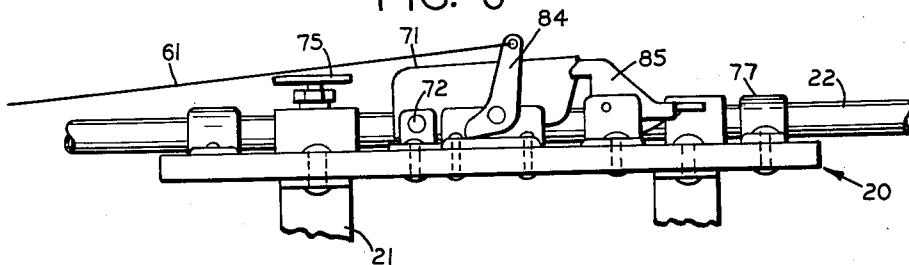


FIG. 6



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3,075,540 FOAM DISPENSING ATTACHMENT FOR SCRUBBING MACHINES

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5 Claims. (Cl. 137—312)

This invention relates to rug cleaning machines and relates more particularly to an apparatus for attachment to such machines which will provide means for generating a foam and also for controlling the consistency of the foam.

Overwetting is considered one of the most burdensome problems encountered in the field of carpet shampooing and the elimination of said overwetting is accomplished by delivering an air saturated foam instead of liquid to the scrubbing member. The apparatus of the present invention utilizes a foam generating device of the type disclosed in my patent, Number 2,960,710 and provides a compact unit for attachment to standard type shampooing devices with rotary fountain brushes or other scrubbing devices.

The object of the present invention is to provide an apparatus to generate a foam to be delivered to the scrubbing member in place of liquid and further to enable the operator to vary the consistency of the foam at will and also to visually determine the condition of the foam during operation of the shampooing machine.

Another object of the invention is to provide means whereby cleaning solutions which generally are considered to be difficult to convert into a foamy condition are nevertheless readily utilized.

In the accompanying drawings:

FIG. 1 is a side elevation view of the complete apparatus as attached to a rug cleaning machine.

FIG. 2 shows the housing of the apparatus of FIG. 1, this view being a broken vertical section taken substantially on the plane of line 2—2 of FIG. 3.

FIG. 3 is a view similar to FIG. 2 but on substantially the plane of line 3—3 of FIG. 4.

FIG. 4 is a broken top plan view of the housing of FIGS. 2 and 3.

FIG. 5 shows a plan view of the control unit.

FIG. 6 is a side elevation of the control unit.

Referring now more particularly to FIG. 1, a housing 10 forms an enclosure for a foam generator 11, the housing being mounted, by means of a bracket 12, on the handle 13 of a conventional floor shampooing machine including a rotary brush 15, a brush housing 16 and a motor 17 for driving the brush. A control unit 20 is mounted adjacent the upper end of the handle by means of brackets 21. This control unit supports and receives a liquid supply line 22 and an air supply line 23. After passing through the control unit the liquid and air are fed to the housing by conduits 24 and 25, respectively.

A partition 26 extends from the front to the rear walls of the housing and another partition 27 extends from wall 26 to the right side wall 30 when viewed in FIG. 3. Partitions 26 and 27 divide the righthand side of the housing into a liquid separator chamber 33 in which the discharge outlet of the foam generator 11 is positioned and a foam passage 35 having an outlet 36 at its lower end to which is connected a flexible conduit 37 leading to the brush housing 16. The upper edge 31 of partition 27 extends upwardly to a point spaced from upper wall 32 of the housing forming a raised opening from the liquid separator chamber 33 to the foam passage 35.

Conduits for the cleaning liquid and air, 24 and 25 respectively, are connected with the lower wall of the foam generator which has a screened discharge outlet 40 on

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top. Introduction of the cleaning liquid and air into the foam generator in controlled amounts causes the foam to be generated therein and it flows out of the top of the generator. Sealing plate 41 extends around the foam generator and extends between the latter and the adjoining walls to form the bottom of the liquid separator chamber 33.

It will be apparent from the foregoing that the foam rises in chamber 33, pushes over the top of partition 31 and descends through passage 35 and into the conduit 37 to the rotary brush. Partition 31 is sometimes referred to as a "weir" in the sense that it presents a dam in the wall of a compartment adapted to be overflowed by material in the compartment in such a manner that the fact and approximate rate of overflow are observable and, to a limited degree, subject to estimate as to such rate. A liquid receiver basin 42 formed by partition 26 and lefthand outer wall 43 is provided with a generally horizontal intermediate shelf 44 which slopes slightly downwardly to a drain opening 45. This drain opening is normally open and for the purpose of closing it when necessary a bushing 46 having a conical opening 50 at its lower end is connected with opening 45 and the drain is arranged to be closed by a closure plug 51 supported at one end of a rod 52. A shield 53 is secured intermediate the ends of the rod and a plate 54 is secured at the upper end of the rod. This plate engages a coiled compression spring 55 whose upper end engages the upper wall of a spring enclosure 56 held by a U-shaped bracket 60 secured to the front wall of housing 10. A cable 61 is secured at its lower end to the upper end of rod 52 and passes through an opening in the upper wall of the spring enclosure 56.

A substantially U-shaped trap comprising a foam flow restriction has one end 62 connected to the lower part of liquid separator chamber 33 and its other end 63 connected with basin 42 which has an open-to-view portion at its upper end so that liquid passed through the trap is within the view of the operator.

The cleaning liquid and air mixture which enters foam generator 11 in manually controlled amounts produces the foam mixture which emerges from the foam generator into the liquid separator chamber, passes over partition 27, into passage 35 and thence to the brush head. Liquid as distinguished from the foam will at times be present in the mass and this liquid, being heavier than the foam will accumulate in the liquid separator chamber 33 above plate 41. The inlet of the trap from this chamber is located just above this plate and accordingly the liquid fills the trap and passes out through the trap onto sloping horizontal shelf 44 of the basin 42, through drain 45 and into lower chamber 64. The liquid in the trap prevents foam, under a slight pressure, from being forced through the trap.

When necessary the accumulated liquid in chamber 64 may be removed to a remote receptacle, without interrupting the work process, through drain pipe 66 which extends substantially to the bottom of chamber 64. To drain this liquid, plug 51 is first moved upwardly by drawing on cable 61 to close the drain and air under pressure is introduced into chamber 64 through pipe 70.

The control unit 20 will now be described. The parts are mounted on a base and include a plate 71 hinged at 72 and when this plate is held in the down position of FIG. 6 by means of a releasable latch 73 pivoted in a bracket 74, normally closed push button valves 79 and 80 underlying said plate are open. These push button valves are in the line of flow of conduits 22 and 23. In this position the liquid and air pass through the flexible conduits to the system. When the plate is in the "up" position under the influence of a spring (not shown) the

valves are closed. A liquid metering valve 75 and an air metering valve 76 adjust the flow of liquid and air when the lines are open. Conduits 24 and 25 are connected to the outlet ends of valves 75—76. The conduits are mounted on the base by means of brackets 77.

A T fitting 80 connects air supply line 23 with pipe 70 through a third push button valve 81 and when this valve is depressed air passes into chamber 64 through pipe 70 and the liquid in the chamber returns through pipe 66 to a liquid reservoir (not shown).

Cable 61 is connected with a pivoted arm 84 arranged to be latched by latch member 85.

The operation of the apparatus is as follows: Plate 71 is retained down by latch 73, thus opening liquid and air lines to the system, the metering valves 75—76 are given their initial adjustment and foam from the generator starts to flow. The rug shampooing operation may then start. Liquid discharging from the trap into basin 42 is within view of the operator and if too much liquid flows into the basin the liquid supply is reduced. The consistency of the foam issuing from the brush head and the quantity, if any, of liquid passing through the trap indicates whether the liquid-air ratio is proper. If no liquid passes thereby the consistency is either just right or is too dry. Whether or not the latter is the case can be determined by examining the foam as it issues from the brush. If the foam is too dry the liquid supply is increased. The foregoing arrangement employs conduit 66 to return the excess liquid from chamber 64 back to a liquid receptacle. This excess liquid may, of course, be directed to a waste line.

While there have been described herein what are at present considered preferred embodiments of the invention, it will be obvious to those skilled in the art that many modifications and changes may be made therein without departing from the essence of the invention. It is therefore to be understood that the exemplary embodiments are illustrative and not restrictive of the invention, the scope of which is defined in the appended claims, and that all modifications that come within the meaning and

range of equivalency of the claims are intended to be included therein.

What I claim is:

1. Foam supplying mechanism for use with a rug cleaning machine for supplying foam of the proper degree of wetness thereto comprising: a foam generator; a liquid separator chamber so disposed and arranged as to receive foam from the generator, said liquid separator chamber having a lower region in which excess liquid gathers which may have been entrained in the foam generated by the foam generator, and an opening above said lower region, said opening adapted to discharge foam to the machine for use in cleaning operations; a basin; a trap interconnecting said lower region to the basin; and means for permitting observation of the rate of flow of liquid to the basin, whereby the presence of excessive liquid in the foam is detectable by a said observation, and whereby foam without excessive liquid flows through the opening.
2. A foam supplying mechanism according to claim 1 in which the opening comprises a weir, and in which the trap is an upright U-shaped conduit.
3. A foam supplying mechanism according to claim 2 in which the means for permitting observation comprises an opening above the basin.
4. A foam supplying mechanism according to claim 3 in which a receptacle chamber is connected to the basin to receive liquid from the basin.
5. A foam supplying mechanism according to claim 4 in which conduit means interconnects the basin and the receptacle chamber, and in which valve means is incorporated in said conduit for controlling liquid flow there-through.

References Cited in the file of this patent

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