United States Patent

[11] 3,583,818

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[21] Appl. No. **752,284**
[22] Filed **Aug. 13, 1968**
[45] Patented **June 8, 1971**
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[32] Priority **Aug. 25, 1967, Oct. 30, 1967, Nov. 13, 1967**
[33] **Australia**
[31] **26,399/67, 29,101/67 and 29,717/67**

[54] **CARPET SHAMPOO APPARATUS**
8 Claims, 8 Drawing Figs.

[52] **U.S. Cl.** **401/22,** 401/137, 15/374
[51] **Int. Cl.** **A47l 1/08**
[50] **Field of Search** 401/22/4, 35, 224, 137-9, 136, 220; 15/374

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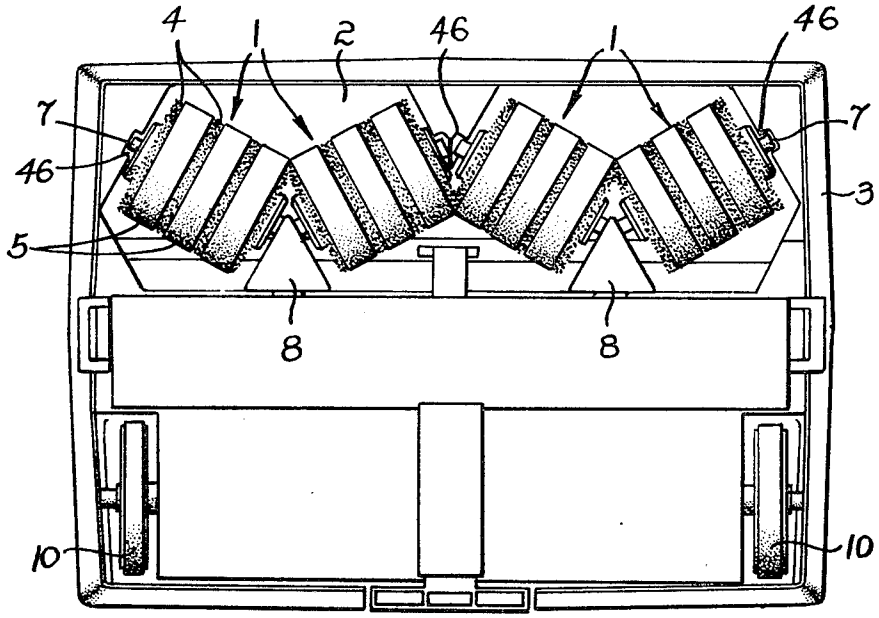
ABSTRACT: A carpet shampoo apparatus sing members both capable of brushing and absorbing which move at an angle to the direction of travel to brush and shampoo the carpet but to remove excess shampoo liquid and foam from the carpet.



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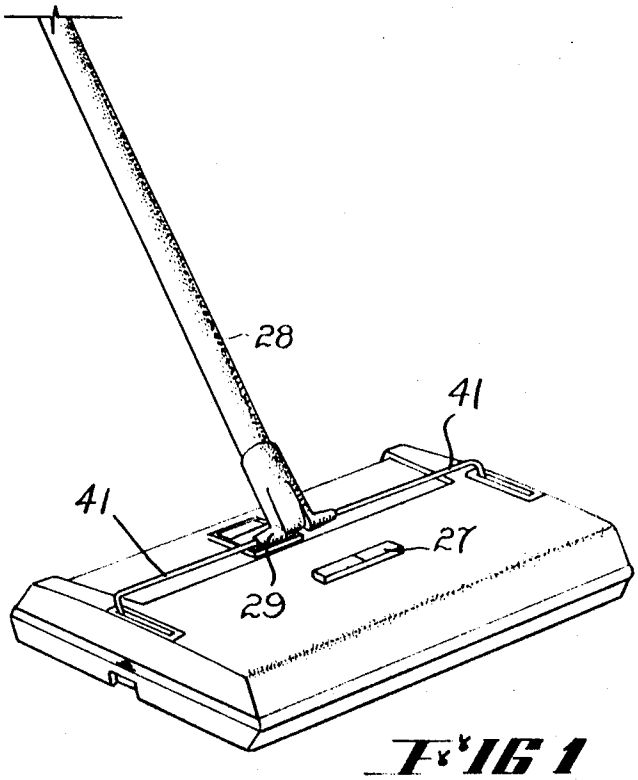

FIG 1

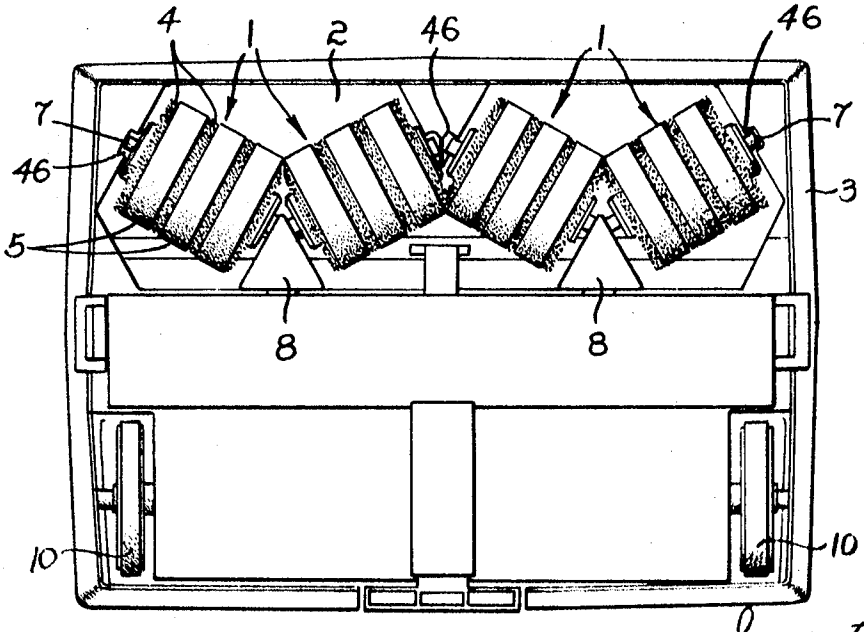

FIG 2

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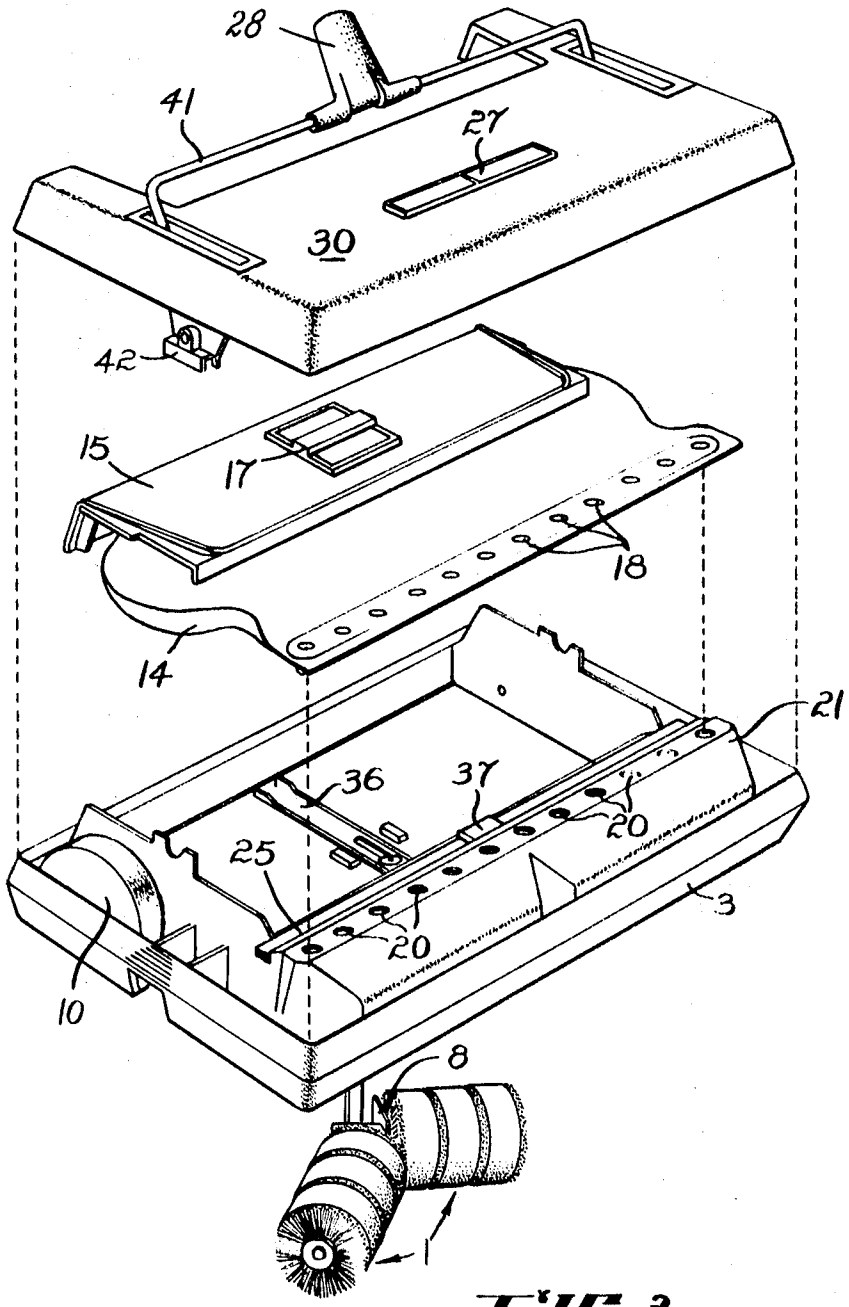

FIG 3

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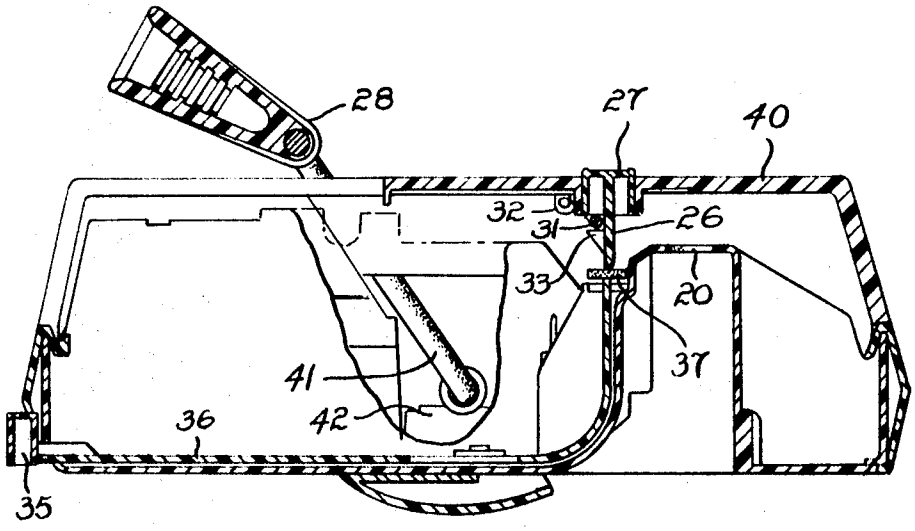

FIG 4

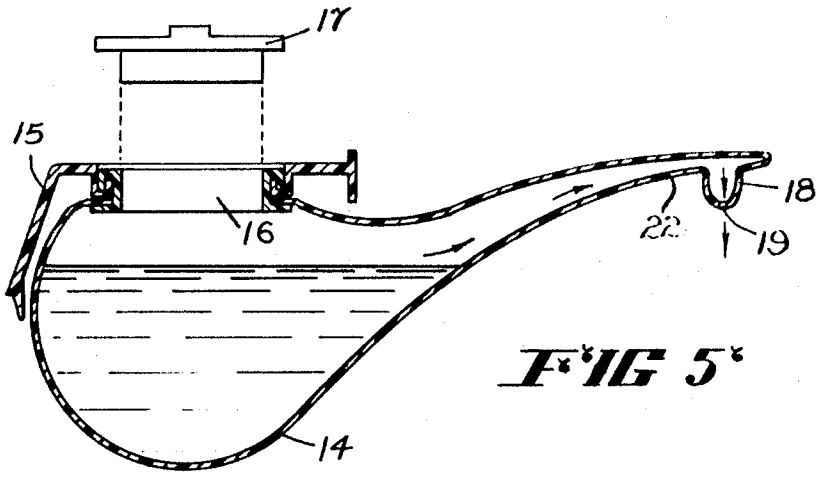

FIG 5

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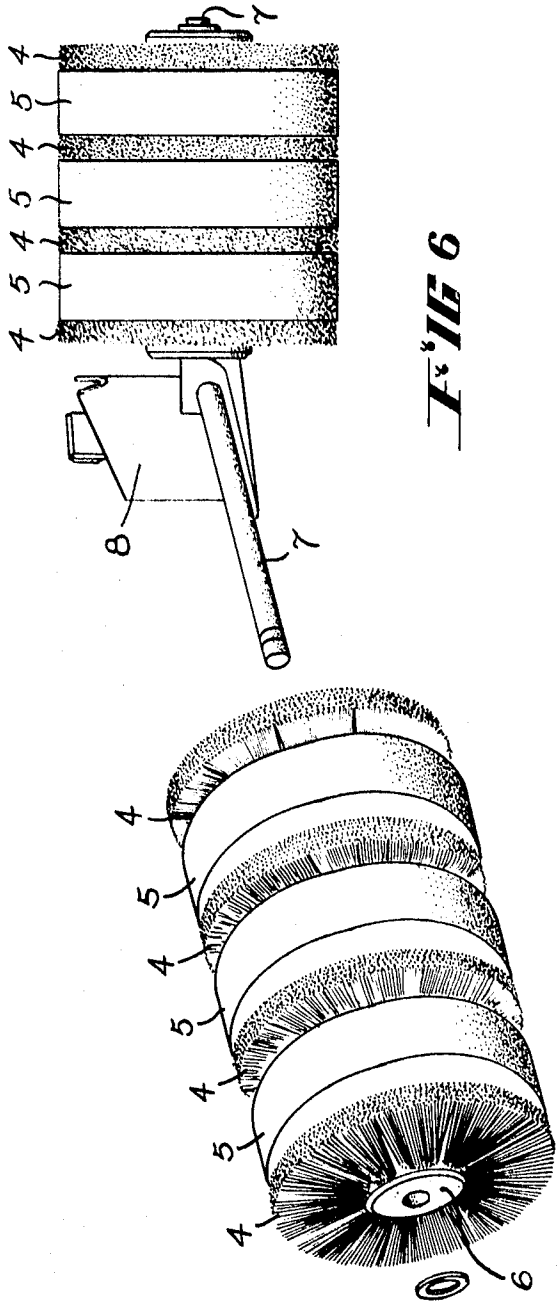

FIG 6

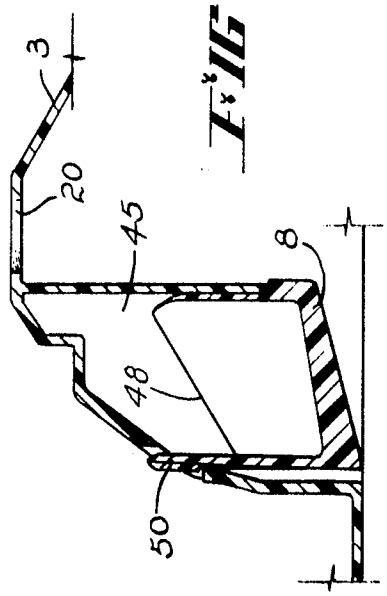

FIG 7

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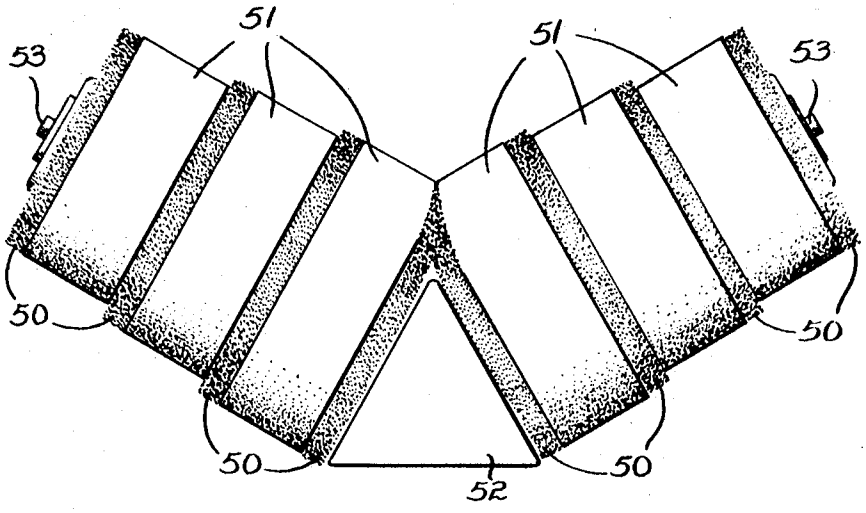

FIG 8

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CARPET SHAMPOO APPARATUS

This invention relates to a carpet shampoo apparatus.

In the most desirable form of the art shampooing of carpets is carried out by machines in which revolving or otherwise moving brushes and/or rollers perform a scrubbing action on the carpet in the presence of a cleansing fluid or foam. These machines are usually operated by electrical power.

It is also known to endeavor to shampoo carpets using simpler mechanical units manually rather than electrically operated. In these it is usual to have one or more foam rollers which serve to dispense over the carpet a quantity of shampoo fluid; in addition to the rollers there are often one or two rows of bristles, set in the form of transverse stationary brushes in contact with the carpet pile. The difficulty with this type of apparatus is that there is no true scrubbing action which is essential to loosen dirt and soil from the carpet, furthermore in order to provide a better semblance of cleaning, comparatively large amounts of cleaning fluid or shampoo are flowed by means of the rollers on to the carpet. This fluid thoroughly wets the carpet pile and tends to carry down dirt and grime to the base of the carpet fibers where they remain. Length of drying time required before the carpet should be used again for traffic varies greatly according to ambient temperatures and humidity, it is not unusual for this drying period to be upwards of 2 to 3 days.

It is, therefore desirable to carry out the shampooing operation by means of a suitable brushing, sponging, scrubbing action, so that aided by the cleansing effect of a suitable shampoo fluid, all dirt and grime will be loosened from the carpet pile. Further, the flow of shampoo fluid should be effectively controlled so that no more than is required for efficient cleaning of the pile is allowed to be deposited.

The object of this invention therefore is to provide a new and improved shampoo device which will firstly have an effective device in contact with the carpet for brushing and/or scrubbing the surface of the carpet to present the pile for proper cleaning, thus producing foam or lather by suitable movement to loosen dirt and achieve effective cleaning, a further object being to provide a sheering action at the surface of the carpet which will ensure the best removal of the grime or dirt on the carpet, a still further object being to provide a simple and effective means for applying the shampoo liquid to the carpet in quantities consistent with the cleaning required a yet further object being to provide a means for holding the shampoo liquid which will prevent undue frothing yet will feed required amounts to reservoirs which will discharge the liquid to the cleaning mechanism in the required amount, a yet further object being to provide simple and effective cutoff means for control of this liquid feed.

In a simple form the invention comprises a housing, a series of brushes rotationally carried by the housing and having their axes angularly inclined to the direction of travel of the housing or of differing diameter and adapted to contact the surface being shampooed, and means to supply regulated quantities of a shampoo liquid to the surface from a container.

According to a preferred form the invention comprises a series of brushes angularly disposed in relation to the direction of travel and associated with sponge rubber or similar discs, preferably absorbent, the cleaning members so formed being inclined at an angle to the direction of travel but different members being disposed at opposite angles so that the surface of the carpet is in effect brushed from left to right and from right to left according to the contact at each locality, the members being fed with shampoo, preferably under control of a fore and aft movement of the apparatus, from perforated reservoirs discharging on to the cleaning member, and these reservoirs in turn are fed from a container, preferably a resilient bag which contains the shampoo liquid and is provided with pressure means whereby flow from the bag to the reservoirs can be controlled or terminated. The brushes and sponges which form the cleaning members can themselves

vary in diameter or can taper from one end to the other to give a different peripheral speed along the brushes and sponges for an increased action on the carpets.

In order however that the invention will be more fully understood, embodiments thereof will now be described with reference to the accompanying drawings which are to be taken by way of illustration only and not as limiting the scope of the invention, the scope being defined in the claims herein.

In the drawings:

FIG. 1 is a perspective view of a carpet shampoo apparatus, according to the invention,

FIG. 2 is an enlarged underside view of same showing the shampooing members,

FIG. 3 is an exploded view of the invention showing beneath the body one set of shampoo members as separated from the body and showing above the body firstly the liquid storage and dispensing portion of the apparatus and above same the cover which completes the assembly,

FIG. 4 is a transverse section of the invention showing particularly the cutoff mechanism which prevents flow from the storage reservoir to the nozzles when flow is not required,

FIG. 5 is a view of the storage reservoir and nozzles, the view being a cross section,

FIG. 6 is a perspective view showing one of the shampooing members with one side in its assembled position, but with the other side having the brushes and sponges, which form the member, in their unassembled position,

FIG. 7 is an enlarged fragmentary section showing the support for the brush assembly, and

FIG. 8 is a plan showing a modified shampoo assembly in which the diameter of the brushes and sponges vary along the length of the assembly. The brushes and sponges can be interlocked for synchronized rotation to achieve a greater brushing action.

The shampooing members 1 are disposed in zigzag formation within a channel 2 in a main housing 3 and comprise a series of cleaning members each consisting of alternately placed brushes 4 and resilient sponge discs 5, the brushes in the embodiment shown consisting of radiating tufts, relatively narrow width radiating from a boss 6, and being assembled so that there are perhaps four brushes on an axle 7 with spaces therebetween to take three sponge discs 5 having a diameter preferably slightly less than the brushes.

Two of such cleaning members can conveniently be mounted from a single axle support 8 clipped into the housing, the axles 7 from the axle support 8 projecting in opposite directions but at an angle to each other so that both of these cleaning members are disposed at an angle transverse to the line of travel of the unit. Thus when one of the members sweeps towards the left, the other sweeps toward the right, these cleaning member units being repeated along the sweeper so that a zigzag series of cleaning members extend across the sweeper as shown, all being free to rotate on their shafts 7 and each being provided with the brush and sponge sections.

This free rotation is however not necessary as the assemblies can be locked together to rotate as one unit. This can be achieved by having interengaging bosses on the brushes and sponges, or friction at contiguous surfaces can be used to achieve this.

The lower parts of these cleaning members project below the base of the sweeper body and are disposed near the forward edge of same, but the rear of this body is provided with a pair of wheels 10 which maintain the body in spaced relationship from the ground in conjunction with the cleaning members 1 which form the forward supports.

By utilizing a series of disclike bosses 6 with radiating tufts of brushes thereon and assembling them on a shaft 7, an effective brush is provided which, when set at an angle to the direction of travel, has a brushing or sweeping action on the pile in a direction transverse to the travel of the unit, this action loosening the pile and presenting all parts of the surface of the pile for cleaning, the sponge members 5 between these brushes 4 serving to hold the shampoo liquid and at the same

time acting to clean the surface and hold the liquid to generate foam so that only a small amount, mainly foam, can reach the actual pile of the carpet to be spread evenly thereon.

It will be realized that because of the angular position of the axle 7 on which these members 1 rotate a sheering action results on the sponge discs 5 which has been found in conjunction with the brushes to have an ideal cleaning effect, the unit of course having adjacent cleaning members disposed at the opposite angle so that as it is moved over a carpet some parts of the carpet are being moved towards the right and some towards the left but as the unit is moved forward and backward over the carpet it will be realized that a continuously changing thrust direction on the carpet results with highly advantageous cleaning and shampooing effects.

The bag 14 which holds the shampoo liquid can conveniently be formed of plastic or other flexible material and is attached to a rigid support 15 which has a filler opening 16 and cap 17. The support 15 holds the rear of the bag 14 in place in the housing 3, the forward end of this bag having attached to it, in communication with the inside of the bag, a series of depending reservoirs 18 having discharge apertures 19, the reservoirs 18 being shaped so that they engage in apertures 20 in a part 21 of the housing immediately above the cleaning members.

During use, the reservoirs 18 receive liquid from the bag 14 over the weir 22 as the unit is moved forward and backward during the cleaning action, the bag, because of its relationship to the reservoirs 18, serving to effectively control the flow of liquid to the reservoirs, the reservoirs of course being generally higher than the highermost part of the bag itself as illustrated, this having the effect that the reservoirs are periodically filled by flow of liquid due to the fore and aft cleaning movement of the unit when such unit is in use.

In this way the reservoirs contain only the required amount of shampoo liquid and do not overfeed the cleaning members 1, the feed thus being in proportion to the use of the device and requiring no shutoff member, although a shutoff device is provided to allow the device to be used without a feed of shampoo liquid taking place.

The apertures 19 in the reservoirs 18 are such that measured quantities of liquid from the reservoirs 18 can flow to the cleaning members 1, and these measuring apertures have conical surfaces adjacent the measuring edge so as to ensure minimum blockage of these apertures, the discharge end of the apertures being of larger diameter than the intake ends.

Adjacent to the reservoirs 18 is a resilient bed 25 which cooperates with a blade 26 disposed on the opposite side of the bag, and extending the full length of the bag, and provided with a pushbutton 27 so that this blade 26 can be forced down to press the bag on to the bed 25 to seal off any flow to the reservoirs, this then ensuring that the amount of liquid fed to the reservoirs can be adequately controlled because if the carpet is receiving too much shampoo it is only necessary to actuate the blade by swinging the handle 28 forwardly to cause the handle mount 29 of the handle to engage the pushbutton 27 and thus bring the blade down into its cutoff position where it presses the two sides of the neck of the bag 14 together to prevent flow to the reservoirs 18. A spring 31 engaged in sockets 32 at each end rests on a lug 33 on the blade 26 and either holds the blade 26 in its raised or depressed position by passing over a center position.

To release the blade 26 from depressed position a press member 35 is provided which has a flexible extension 36 terminating in a button 37 adjacent to the blade against which it pushes when the member 35 is depressed, the lockover spring 31 permitting movement of the blade 26 to clear it from the neck 22 of the bag 14.

The bag can readily be removed from the unit if such is desired by disengaging the reservoirs 18 from the apertures 20 in the housing but under normal circumstances this is not necessary and to fill the device it is only necessary to remove the filler cap 17 and to place shampoo into the bag 14 through the filler opening 16 and then replace the filler cap 17.

The cover 40 of the unit carries the handle 28 through the mount 29 and arms 41 which engage clips 42 which allows the cover to clip on to the housing 3 of the unit so that by simply pressing on these clips the cover 40 can be removed to expose the bag and this then readily allows the bag to be removed if required. This cover assembly is shown particularly in FIG. 4.

The whole assembly is preferably such, and is so shown, that no bolts or screws are needed but each part simply clips on to the next, the cleaning members 1 being formed in pairs supported from axles 7 and axle supports 8, the axles with the cleaning members thereon being at the required angle so that these cleaning members 1 can readily be positioned by simply pushing the axle supports 8 into suitable holding sockets 45 in the housing, the free ends of the axles engaging in guides 46 in the housing 3 to give rigid support to the axles 7, the cleaning members 1 as said being arranged to project across the front part of the unit but all having their axis alternating in relation to the direction of travel so that their cleaning or shampooing action is opposite for adjacent sections of cleaning members 1. A tongue 48 holds the member 8 in the socket 45.

In the embodiment shown in FIG. 8 the brushes 50 and the sponges 51 taper in diameter from a larger size at the support 52 to a smaller size at the free end of the support shafts 53.

The taper could, of course, be reversed, and it will be realized that as the shafts 53 are in a flattened "V" position, it is possible to get effective contact with the carpet by raising or lowering the support 52 at the apex of the "V" to ensure contact of the smaller as well as the larger brushes and sponges with the surface being cleaned or shampooed.

From the foregoing it will be realized that a very simple and effective unit is provided which has a series of angularly operating cleaning members each composed of brushes and liquid retaining means, such as sponges which are dampened with a shampoo preferably from a container in the nature of a flexible bag with or without means whereby the flow can be controlled, the whole unit preferably being formed in a simple manner by clipping together various sections but generally comprising a main housing into which the cleaning members can be clipped and in which the bag to hold the liquid can be placed, a cover clipping in position over this unit and provided with a handle and the necessary control means for the unit.

While several embodiments of the invention have been disclosed herein, it will be appreciated that modification of these particular embodiments of the invention may be resorted to without departing from the scope of the invention as defined in the appended claims.

We claim:

1. An apparatus for shampooing surfaces comprising a housing, a series of cleaning members rotationally carried by the said housing, and having their axes lying in a horizontal plane but being angularly inclined to the direction of travel of the housing and adapted to contact the surface being shampooed, the cleaning members being so positioned and of a diameter so as to have laterally overlapping cleaning areas when moved in the direction of travel of the housing, and means to supply shampoo liquid to the said surface being cleaned.

2. A shampoo apparatus according to claim 1 characterized in that the cleaning members are provided in sets and each set comprises a plurality of axially spaced brush sections with narrow radiating tufts, and disposed between the narrow brush sections discs of sponge material.

3. A shampoo apparatus according to claim 1 characterized in that the liquid is supplied to the said surface by discharging it onto the periphery of said cleaning members.

4. A shampoo apparatus according to claim 1 characterized in that the cleaning members are arranged in sets with the axes of adjacent sets oppositely inclined to sweep alternately slightly to the left and right with respect to the direction of travel.

5. A shampoo apparatus according to claim 1 characterized by a plurality of brushes each comprising a plurality of brush sections with narrow circumferentially spaced tufts, and

disposed between the said brush sections discs of sponge material, said brush sections and interposed sponges being rotationally carried on axles supported from axle supports engageable on the said housing said axles being angularly disposed relatively to the direction of travel.

6. A shampoo apparatus according to claim 1 characterized in that the cleaning members comprise a series of disc-shaped brush sections with narrow radiating tufts, and disposed between the narrow brush sections discs of sponge material, each of said brushes of said series and each said sponges being approximately of the same diameter but with the brushes preferably slightly larger than the sponges.

7. A shampoo apparatus according to claim 1 characterized by a plurality of cleaning members each comprising a series of disc-shaped brush sections with narrow radiating tufts, and disposed between the narrow brush sections discs of sponge material, said brushes of said series and each of said sponges varying in diameter and the brushes and sponges are assembled on a shaft to give a tapered cleaning member.

8. An apparatus for shampooing surfaces comprising a housing, a series of cleaning members rotationally carried by the said housing, and having their axes lying in a horizontal plane but being angularly inclined to the direction of travel of the housing and adapted to contact the surface being shampooed, and means to supply shampoo liquid to the said surface being cleaned; and the cleaning members being provided in sets and each set comprises a plurality of axially spaced brush sections with narrow radiating tufts, and disposed between the narrow brush sections discs of sponge material; and two sets of cleaning members being present, a pair of axles used in each set to support said cleaning members, each pair of axles engaging an axle support between them, the axles of each pair being at an angle to each other to form a flat "V" with its medial line arranged in the direction of travel of the apparatus, all of said cleaning members providing laterally overlapping cleaning action with a laterally adjacent cleaning member when in use.