Feb. 23, 1965 A. J. KRAMER 3,170,186

CLEANING DEVICE

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FIG. 2.

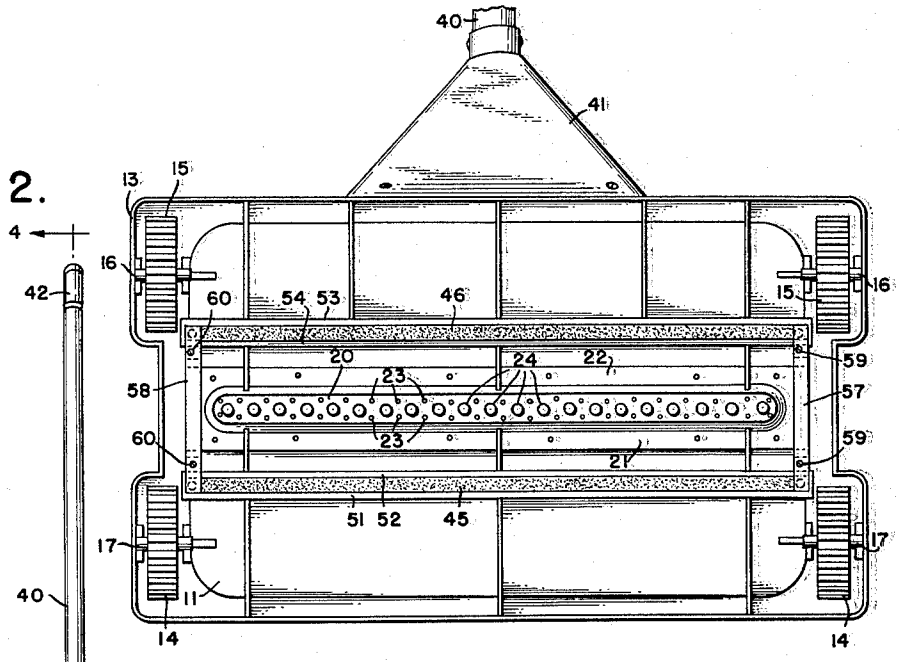


FIG. 3.

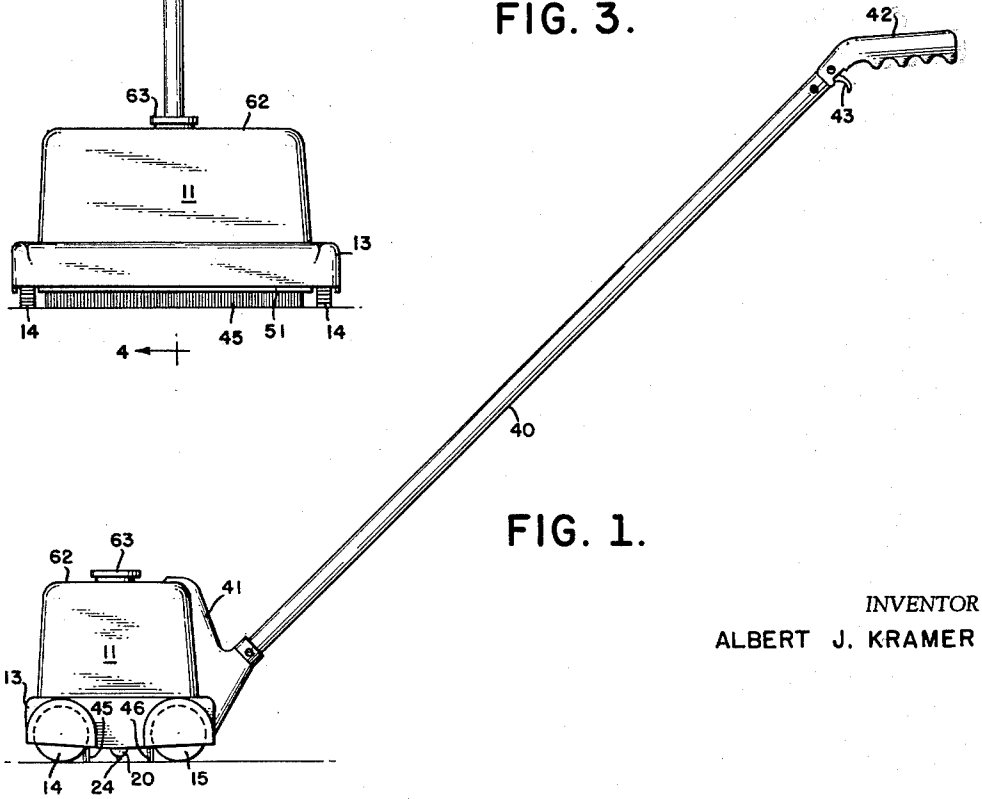


FIG. 1.

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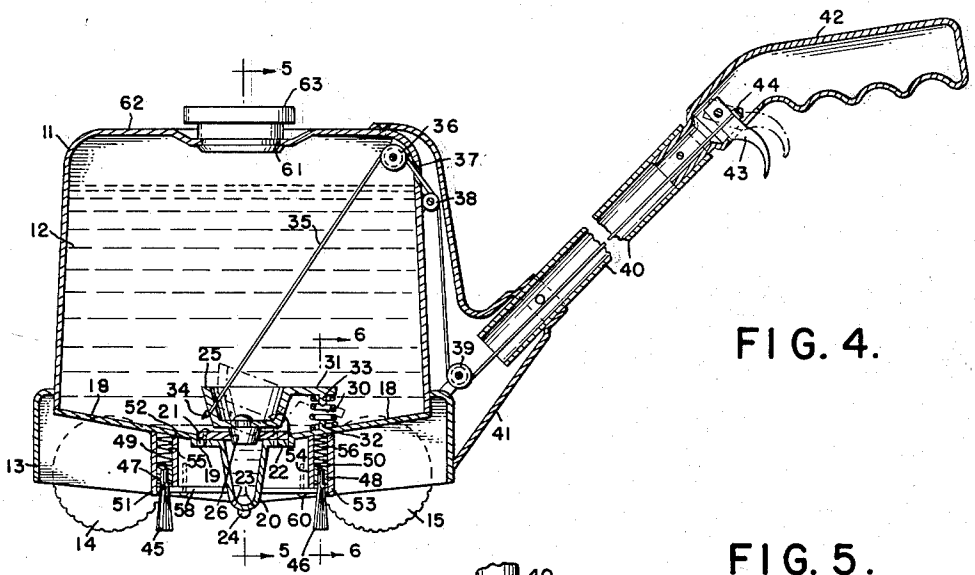


FIG. 4.

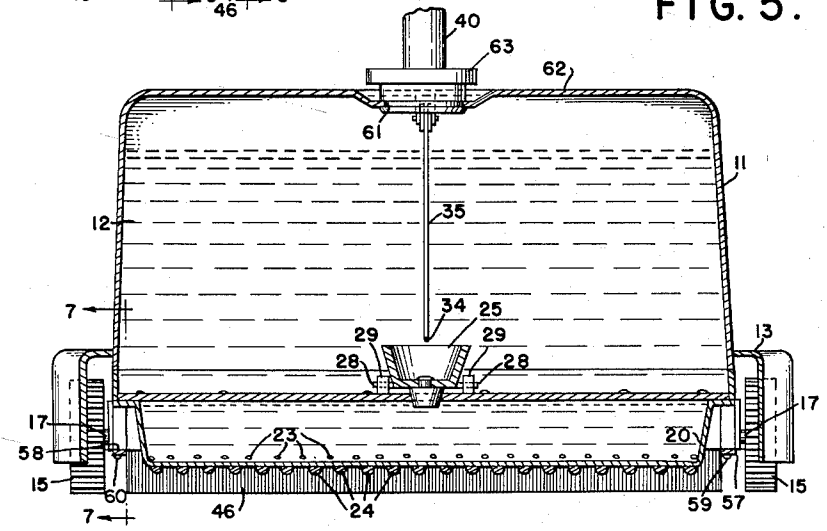


FIG. 5.

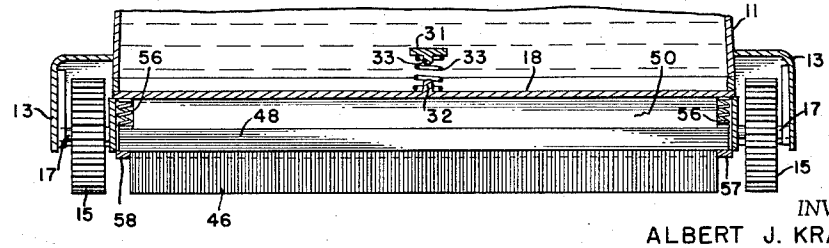


FIG. 6.

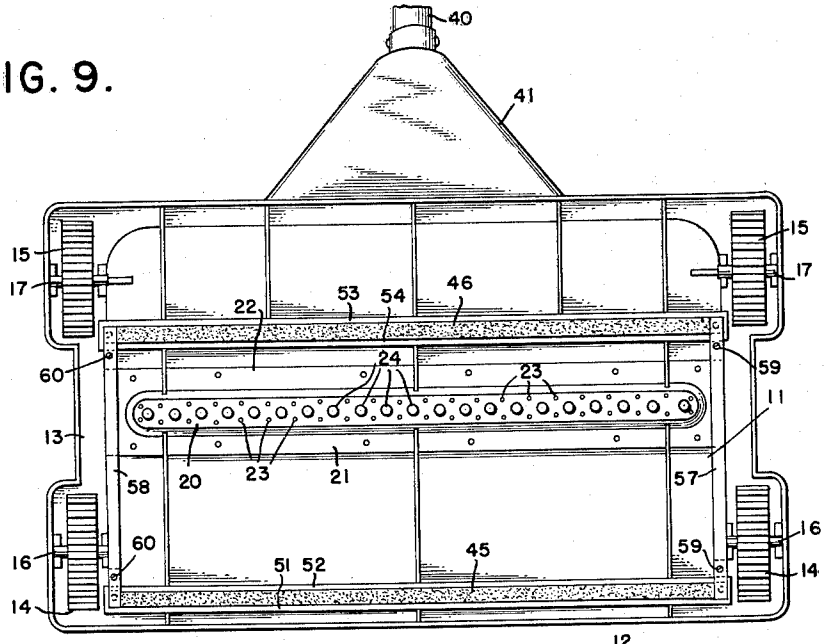
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FIG. 9.



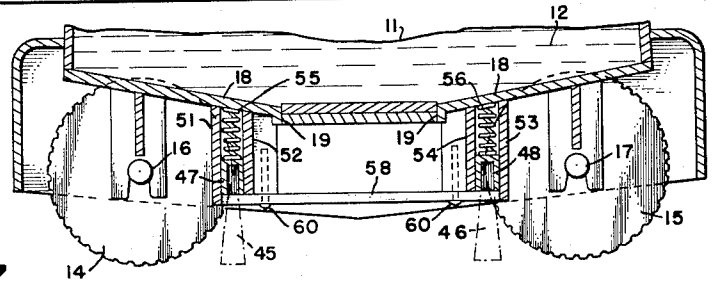
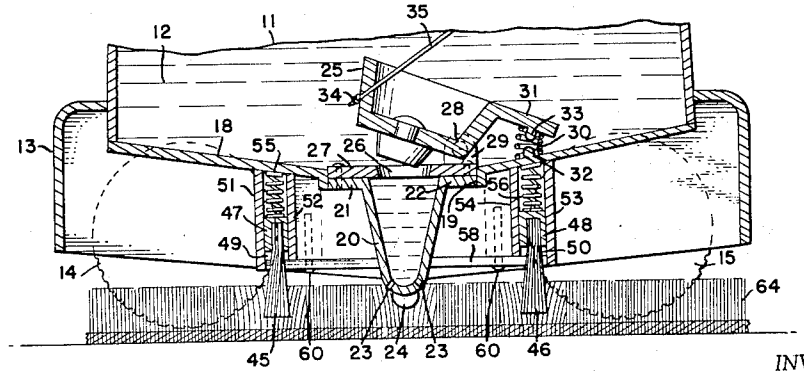


FIG. 7.



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FIG. 8.

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3,170,186

CLEANING DEVICE

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Filed Sept. 4, 1963, Ser. No. 306,465
11 Claims. (Cl. 15—532)

This invention relates to cleaning apparatus and it is more particularly concerned with a device for use in cleaning and shampooing rugs, carpets and similar materials having nap surfaces.

A general object of the invention is the provision of such a device which can be operated by hand with relatively little effort and which is highly effective in loosening the dirt from nap surfaces.

A specific object of the invention is the provision of such a device which is relatively inexpensive to manufacture, yet highly effective in use, sturdy and long wearing.

Another object of the invention is the provision of improvements over prior nap cleaning devices to facilitate the application of detergents, the brushing of the nap, the provision of means for providing proper brush pressure against the nap surfaces, for simply and readily replacing worn brushes, for facilitating application of the detergent to the nap surfaces and for related improvements, all of which will be apparent from the following description in conjunction with the accompanying drawing.

In the drawing:

FIG. 1 is a side elevational view of an embodiment of the invention.

FIG. 2 is a front elevational view of the same embodiment.

FIG. 3 is a bottom plan view of the same embodiment.

FIG. 4 is a sectional view along the line 4—4 of FIG. 2.

FIG. 5 is a sectional view along the line 5—5 of FIG. 4.

FIG. 6 is a sectional view along the line 6—6 of FIG. 4.

FIG. 7 is a sectional view along the line 7—7 of FIG. 5.

FIG. 8 is a view of the bottom portion of FIG. 4 on a larger scale in relation to a nap surface to be cleaned.

FIG. 9 is a bottom plan view similar to FIG. 2 showing a modified embodiment.

Referring to the drawing with more particularity the embodiment illustrated in FIGS. 1 to 8 comprises a tank 11 for holding a detergent 12.

The tank 11 is integral with a flanged skirt portion 13 around the bottom and it is supported on the surface to be cleaned by a group of front and rear wheels 14 and 15, respectively, mounted on axles 16 and 17 that extend between brackets on the skirt portion and brackets on the main body portion of the tank by conventional means, substantially as shown.

The bottom wall 18 of the tank slopes downwardly toward a longitudinal opening 19 at the center between the front and rear wheels 14 and 15. The upper end of a trough-like detergent applicator 20 having flanges 21 and 22 is disposed in the opening 19 and secured to the bottom wall 18. The lower end of the trough has rows of discharge openings 23 that straddle the apex of the trough and the apex is provided on the exterior with longitudinally spaced pimples 24. Liquid in the tank passes into the trough and out through the discharge openings 23.

The flow of liquid into the trough is controlled by a valve 25 mounted in an outlet 26 of a plate 27 disposed across the top of the trough. The valve is hinged to one side to the plate 27 by means of fingers 28 on either side pivotally engaging hook brackets 29 integral with the plate. The valve is biased to the closed position by means of a coil spring 30 compressibly mounted between the bottom wall 18 and an arm extension 31 of the valve.

Retainer stub pins 32 and 33 are provided on the wall 18 and arm 31, respectively, to engage the ends of the spring and keep it in position.

To a point 34 of the valve offset from its pivot axis there is secured one end of a flexible cable 35. The other end extends upwardly to a sheave or pulley 36 at the top of the tank, then out of the tank through an opening 37 at the top, then downwardly over a second offsetting pulley 38 on the back wall of the tank to a third pulley 39 near the bottom of the tank in alignment with a hollow handle 40 connected to the bottom of the tank by a hollow ferrule 41. The ferrule extends upwardly to the top of the tank to enclose the pulley 38 and opening 37.

The upper end of the handle 40 has a hand grip portion 42 and a trigger type finger lever 43 to which the other end of the cable 35 is attached at 44. By these means the valve can be opened and closed at will by the operator to admit any desired quantity of liquid to the trough during operation.

To the bottom wall of the tank there are attached brushes 45 and 46 on either side of the trough, respectively. These brushes are spring loaded. Each brush comprises a spine bar 47, 48, respectively, adapted to be slidably disposed in inverted channels 49, 50 formed by panels 51, 52 and 53, 54 secured to the bottom wall 18 of the tank. Coil springs 55, 56 are disposed in these channels between the bottom wall and the spine bars 47, 48 to yieldably urge the brushes downward. The brushes are held in place by retainer strips 57, 58 attached to the tank by screws 59, 60.

The tank is provided with a filling opening 61 in the top wall 62 and a closure cap 63 removably seats in this opening.

In operation, the device is used by filling the tank 11 with a foamable detergent of any conventional type suitable for cleaning the nap surfaces 64 to be worked on. The device is then simply moved backward and forward over the nap surface while intermittently tripping the trigger 43 to permit liquid to flow into the trough 20 from the tank and outwardly through the discharge openings 23. The back and forth movement of the brushes operating over the nap surface to which the detergent has been applied results in the detergent becoming foamed. The foam and the brush action are effective to loosen dirt in the nap. The nap surface is then permitted to dry and the loosened dirt retained by the dried detergent is removed, such as by means of a conventional vacuum cleaner.

The position of the brushes may be varied with respect to the trough as may be desired in a particular type of application. For example, in the modified embodiment of FIG. 9 the front brush 45 is set closer to the forward end of the device so as to facilitate reaching areas near walls of a room. Also the brush springs 55, 56 may be changed to provide for a stiffer or softer brushing action and the brushes themselves are readily replaced when they become worn or when it is desired to use longer, shorter, softer or stiffer brushes in different applications of the device.

Having thus described my invention, I claim:

1. A surface cleaning device comprising a tank for holding a cleaning liquid, means for discharging liquid in the tank onto a surface to be cleaned, said means including a hollow rigid member connected to the tank, said member having outlet openings, a brush mounted on the tank independently of and spaced from the rigid member for contacting the surface to be cleaned, means for movably supporting the tank and rigid member to cause continuous and simultaneous contact of the openings and brush with the surface.

2. A surface cleaning device comprising a tank for holding a cleaning liquid, means for discharging liquid in the tank onto a surface to be cleaned, said means including a hollow rigid member connected to the tank, said member having discharge openings, means for movably supporting the tank and member to cause the discharge openings to slidably contact the surface, a brush mounted on the tank independently of and spaced from the rigid member for slidably contacting the surface, and means for connecting the brush to the tank independently of the rigid member and supporting it in resiliently yieldable contact with the surface to be cleaned.

3. A surface cleaning device comprising a tank for holding a cleaning liquid, means for discharging liquid in the tank onto a surface to be cleaned, said means including a rigid member connected to the tank, said member having discharge openings, means for movably supporting the tank and rigid member to cause the discharge openings to slidably contact the surface, a brush disposed on the tank independently of and spaced from the rigid member for slidably contacting the surface, said brush having a rigid spine bar, means connecting the brush to the tank, and resiliently yieldable means acting on the spine bar to hold the brush against said surface.

4. A surface cleaning device as defined by claim 3 in which a pair of the brushes are provided, one brush on each side of the rigid member.

5. A device for cleaning nap surfaces comprising a tank for holding a quantity of cleaning liquid, means for movably supporting the tank on the nap surface to be cleaned, a hollow, rigid liquid applicator projecting downwardly from the tank to contact the nap surface on which the tank is supported, means for passing liquid from the tank to said applicator, said applicator having outlets adapted to contact the surface, and a brush connected to the tank and spaced from the outlets for slidably contacting the nap surface as the device is moved thereover.

6. A device as defined by claim 5 in which the means for supporting the tank comprises a group of wheels arranged to normally hold the tank, brush and applicator in horizontally stable positions.

7. A device as defined by claim 5 in which the brushes are spring loaded to resiliently yield under forces acting upwardly against the brushes relative to the tank.

8. The portable device for cleaning nap surfaces comprising a tank for holding a quantity of cleaning liquid, an elongated, rigid liquid applicator projecting downwardly from the tank to contact the nap surface, said applicator being hollow and extending transversely of the direction of intended movement of the device over the nap surface, the bottom of the applicator being generally narrow to facilitate penetration thereof into the nap surface, means for passing liquid from the tank to said applicator, said applicator having a series of outlet openings adapted to contact the nap surface, an elongated brush generally disposed parallel to the applicator to slidably contact the nap surface as the device is moved thereover, and means for movably supporting the tank on the surfaces to be cleaned independently of the applicator and brushes.

9. A portable device as defined by claim 8 in which the brush is spring-loaded in the direction of the surfaces to be cleaned.

10. A portable device as defined by claim 9 and means for removably attaching the brushes to the tank.

11. A portable device as defined by claim 8 in which the applicator is provided with a series of spaced pimples along the bottom edge adjacent the outlet openings.

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