

June 26, 1962

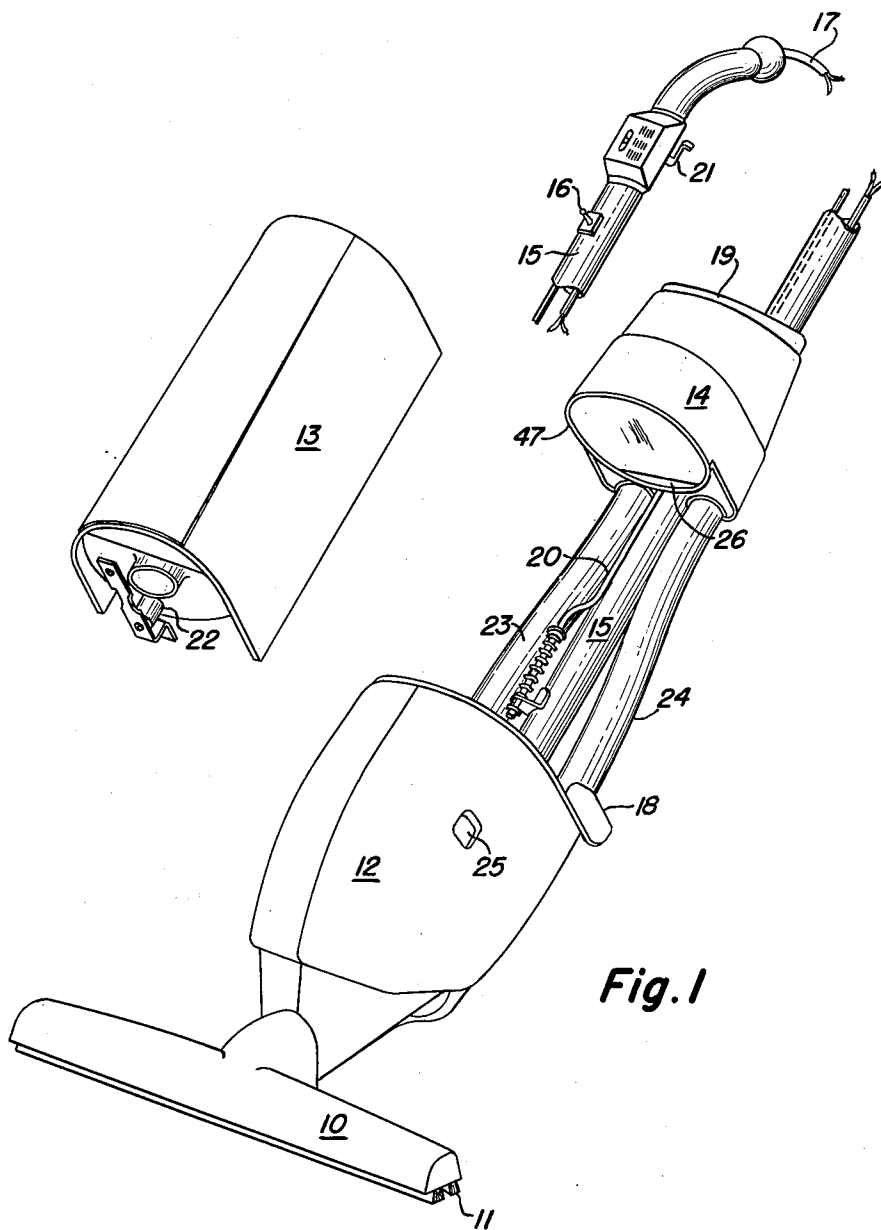
D. C. KRAMMES ET AL

3,040,363

SUCTION FLOOR WASHER

Filed Dec. 14, 1959

3 Sheets-Sheet 1



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SUCTION FLOOR WASHER

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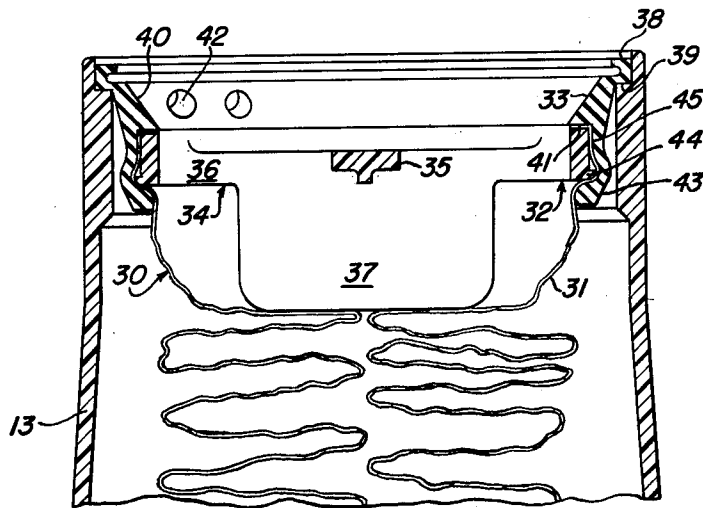


Fig. 2

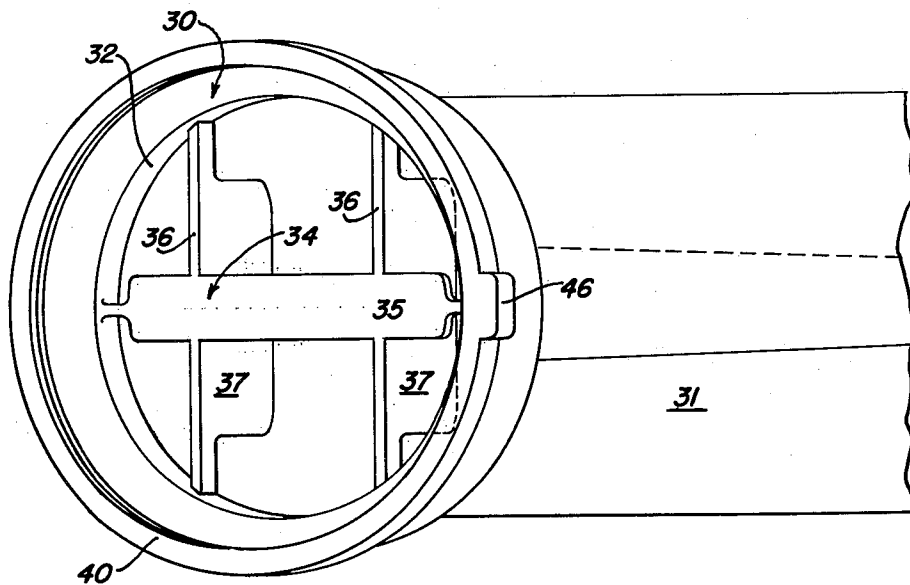


Fig. 3

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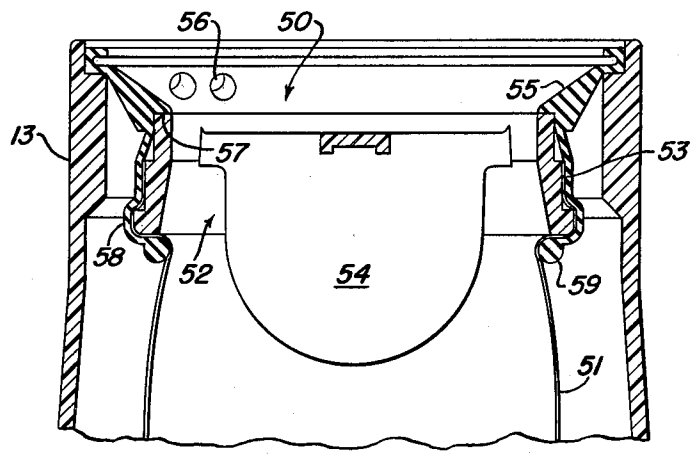


Fig. 4

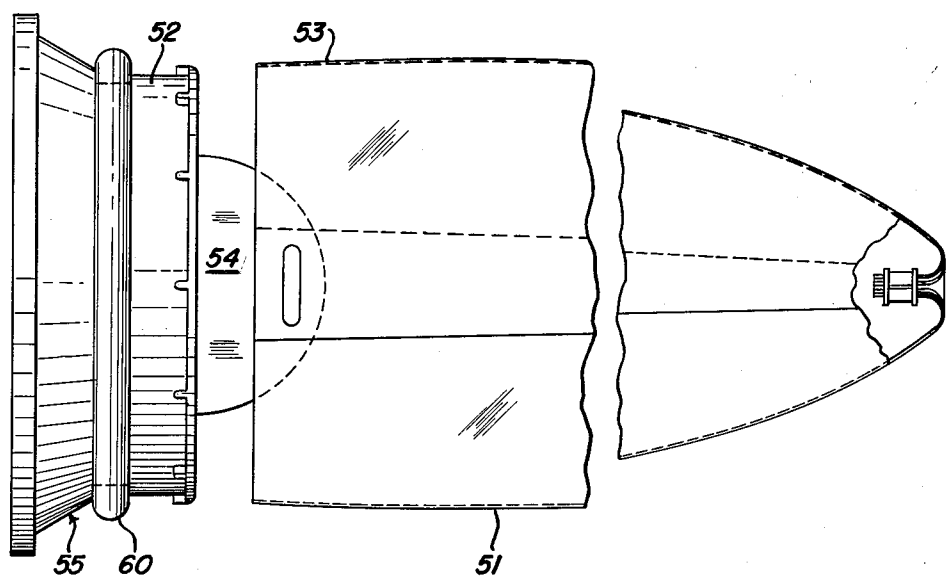


Fig. 5

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SUCTION FLOOR WASHER

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9 Claims. (Cl. 15—320)

The present invention relates to suction floor washing appliances and more particularly to a dirty water collecting bag assembly for use in an appliance of the type disclosed in a copending application by Don C. Krammes, Serial No. 754,093 filed August 8, 1958.

The bag assembly of the present invention is designed to be removably supported in the upper end of a detergent dispensing tank of an appliance of the type disclosed in the aforementioned Krammes application. It comprises a flexible plastic bag having a closed lower end and an open upper end attached to a combined supporting and sealing ring which makes a seal with a supporting shoulder formed in the tank.

The supporting ring is in the form of an outer comparatively resilient supporting and sealing annulus and an inner comparatively more rigid annulus between which the upper open end of the flexible bag is clamped.

The bag assembly of the present invention is for the purpose of collecting dirty water during a time when a suction is applied to its interior. The flexible plastic bag normally floats on top of the detergent in the tank but when a suction is applied over the tank during water pick-up operations the flexible bag has a tendency to be sucked up against the water separator above the tank and thus tends to block the flow of dirty water into the bag. To aid in preventing that, the inner annulus is formed with an interior grid like structure having two baffle plates extending downwardly into the mouth of the flexible bag so that the dirty water will have ready access to the interior of the bag. Additionally, vent openings are provided to equalize the pressures on opposite sides of the bag.

The outer supporting ring is provided with a locating tab extending outwardly from its periphery which interfits with a recess formed in the upper end of the detergent dispensing tank. When the tank is empty and it is desired to empty the dirty water from the tank, the tank is removed from the appliance and a finger or thumb placed over the tab to hold the bag in place during the emptying operation.

The dirty water bag assembly of the present invention may be used over and over again but eventually by accident or by ordinary wear and tear the flexible bag may become punctured or burst, at which time the entire bag including the supporting rings may be replaced.

According to a modified form of the invention, the flexible plastic bag is detachably secured to the supporting rings so that only the flexible bag portion of the device need be replaced when it becomes punctured or worn out.

Other objects and advantages of the present invention will become apparent as the description proceeds when taken in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of an appliance of the type to which the bag of the present invention may be applied;

FIG. 2 is a cross sectional view of the dirty water bag of the present invention showing the details of its construction and how it is mounted;

FIG. 3 is a perspective view of the upper end of the bag of FIG. 2 removed from the tank;

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FIG. 4 is a view similar to FIG. 2 showing a modification of the invention; and

FIG. 5 shows the bag of FIG. 4 as the flexible bag is being applied to its supporting rings.

In order to understand important features of the present invention, a general description of the construction and operation of the appliance to which the invention is applied is necessary. FIG. 1 shows such a machine.

The appliance is a self-contained unit having all of the necessary equipment for dispensing a detergent onto the floor, for scrubbing the floor and for removing the dirty water from the floor. It is more fully described in the previously mentioned Krammes application.

It comprises a suction nozzle 10 having two rows of surface contacting bristles 11 which in effect form the suction mouth of the nozzle, a motor-fan unit 12, a combined detergent dispensing and dirty water collecting tank 13, a separator vessel 14 and a propelling handle 15.

The motor-fan unit 12 is adapted to be energized by a switch 16 connected to a conductor cable 17 which may be plugged into any suitable outlet.

The tank 13 is detachably clamped between the motor-fan unit 12 and the bottom of vessel 14 by a suitable clamp 18 which actuates a cam mechanism to hold the top of tank 13 in sealing engagement with the bottom of vessel 14. The vessel 14 has a closure 19 which is opened and closed by an operating rod 20 which may be actuated by a hand lever 21 adjacent the upper end of the handle 15. The rod 20 also opens and closes a valve 22 in the bottom of the tank 13.

When the lever 21 is in the position shown, the valve 22 is closed and the closure 19 is open. When the lever is pulled upwardly against the handle, the valve 22 is opened and the closure 19 remains open. When the lever 21 is placed in its lowermost position, the lid 19 is closed as is the valve 22.

When the motor is energized by actuation of switch 16, a suction is created by the fan to draw a suction at the nozzle 10 if closure 19 is closed. The suction path includes the nozzle 10, a left hand duct 23, the vessel 14 and a right hand duct 24.

Dirty water laden air is sucked up by nozzle 10 and passes by duct 23 to the separator 14 where the moisture is removed and the dry air continues through tube 24 to the fan where it is placed under pressure and discharged to atmosphere through exhaust port 25. The dirty water separated from the air in vessel 14 flows downwardly through opening 26 into the open end of tank 13 and into the dirty water bag assembly of the present invention generally indicated by the reference numeral 30, FIG. 2, it being noted that, during the water pick-up operation, a vacuum is produced within the tank 13.

The dirty water bag assembly 30 includes a transparent flexible bag 31, preferably made of natural polyethylene, having a closed bottom end and an open top end 45 which is clamped between a comparatively rigid inner annulus 32, preferably of pigmented rigid polyethylene and a flexible and resilient outer ring or annulus 33 preferably of molded rubber.

The inner ring 32 is provided with a grid structure 34 including a web 35 upon which instructions for use may be applied and two cross pieces 36 having baffle plates 37 extending a substantial distance downwardly therefrom.

The outer annulus 33 includes an annular support and sealing portion 38 which rests on an annular shoulder 39 formed in the upper end of tank 13 and which coacts with a rib 47 on the bottom of vessel 14 to form a sealed joint therewith. The annulus 33 also includes an inwardly and downwardly inclined supporting ring portion 40

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formed with an annular shoulder 41 to receive the inner annulus 32 and with a plurality of vent openings 42 extending therethrough. The annulus 33 is also formed with a comparatively flexible annular skirt 43 extending downwardly, outwardly of shoulder 41 which coacts with a rib 44 on annulus 32 to clamp the open end 45 of the bag 31 between the two rings 32 and 33. A lug 46 interfits with a recess in shoulder 39 to provide a tab by which the assembly 30 may be held in position within the tank 13 when dirty water is being emptied.

The lug 46 also keys the bag assembly 30 to the tank 13 in such a position that the vent openings 42 are positioned upwardly should the appliance be laid on the floor and thus prevent the dirty water in the bag assembly 30 from becoming mixed with the detergent in the tank 13.

In practice the open end 45 of bag 31 may be folded over the top of ring 32 and heat sealed thereto, the skirt 43 mechanically expanded while the ring 32 and end 45 of the bag are pressed against the shoulder 41 after which the skirt 43 may be released.

Once assembled the mouth 45 of the bag is tightly held and it is impractical to apply a new bag 31 in the field. As a result, when the bag 31 fails, the entire assembly is replaced by a new one.

In operation, the tank 13 is removed as shown in FIG. 1, the dirty water bag assembly 30 removed, the tank 13 properly filled with detergent, the assembly 30 replaced and the tank 13 assembled to the appliance.

The machine may be operated to scrub floors as previously described. During detergent dispensing and scrubbing operations the closure 19 will be open, no suction will be applied to the interior of tank 13 and the bag 31 will float on top of the detergent in tank 13 and move downwardly with it as it is dispensed. However, during water pick-up operations the closure 19 will be closed and a suction will be applied to the interior of tank 13 which will tend to draw the bag 31 upwardly against the bottom of vessel 14 and over the opening 26 to block the flow of dirty water into the bag assembly 30. However, the vent openings 42 and, as shown in FIG. 2, the grid 32 and especially the baffle plates 37 will prevent the bag 31 from being sucked upwardly and hold the mouth of bag 31 open to provide a ready access for the dirty water from the opening 26.

As the detergent in tank 13 is alternately dispensed and dirty water picked up and deposited in the bag assembly 30, the lower end of flexible bag 31 follows the liquid level of the detergent downwardly until the tank is empty, the dirty water occupying space previously occupied by the detergent. The tank 13 may then be removed from the appliance, a thumb or finger placed over the tab 46 to hold the bag assembly 30 in position and the tank tipped, in the manner of pouring water from a pitcher, to empty the dirty water from the bag assembly 30.

FIGS. 4 and 5 show a dirty water bag assembly 50 in which the flexible bag 51 may be readily removed for replacement by the user when it becomes ruptured or worn out in use.

The inner annulus or ring 52 is of shouldered formation on its outside for interlocking engagement with the mouth 53. Interiorly the ring 52 is formed with a grid structure similar to that of the first modification including baffle plates 54 which prevent the bag from being drawn upwardly when suction is applied to the interior of tank 13.

The outer annulus 55 has substantially the same sealing and supporting arrangement as the first modification including the vent openings 56 and an annular shoulder 57 which interfits with ring 52. However, the annular clamping skirt 58 is of thin elastic material and has an elastic bead 59 at its lower end of smaller diameter than the lower end of ring 52.

To apply the bag 51, the upper end of inner ring 52 is placed against the shoulder 57 of the outer ring 55, the elastic bead 59 and skirt 58 rolled upwardly as shown

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at 60, FIG. 5, the mouth 53 of bag 51 slid over the bottom end of the inner ring 52 and the bead 59 and skirt 58 rolled downwardly over the bag mouth 53 to the position shown in FIG. 4. The bag 51 may be removed by a mere reversal of the process just described.

From the foregoing it can be seen that both modifications of the present invention provide a removable dirty water bag assembly provided with a baffle arrangement by which the flexible bag is held downwardly away from opening 26 to provide an easy access for the dirty water into the bag assembly.

It can also be seen that the second modification of the invention provides an assembly in which the flexible bag may be easily replaced by the user when it is punctured or worn out.

While we have shown but two modifications of our invention it is to be understood that those modifications are to be taken as illustrative only and not in a limiting sense. We do not wish to be limited to the specific structure shown and described but wish to include all equivalent variations thereof except as limited by the scope of the claims.

We claim:

1. A dirty water collecting bag assembly for use with a floor washer in which a suction is applied to the interior of the bag assembly during water pick-up operations comprising, an outer supporting annulus of resilient material provided with means for engaging an annular shoulder formed on the upper open end of a detergent container and a downwardly extending diametrically expansible annular skirt, an inner comparatively more rigid ring member of larger diameter than the unexpanded diameter of said skirt positioned within said skirt with the lower end of said skirt extending inwardly of the outer periphery of said ring member below said ring member and a flexible impervious bag having an open upper end with the material of said open end clamped between said skirt and ring member.

2. A bag assembly according to claim 1 including a grid structure extending across said ring member to prevent said bag from being sucked upwardly through said ring member.

3. A bag assembly according to claim 2 in which said grid structure includes baffle plates extending downwardly into the mouth of said bag.

4. A bag assembly according to claim 1 in which the lower end of said skirt includes an elastic bead normally of smaller diameter than said ring member which may be rolled upwardly over said ring member to release the open end of said bag from said ring member.

5. A bag assembly according to claim 1 including a lug extending from the periphery of said annulus for engagement with a recess formed in the top of said detergent container to be grasped in order to hold said bag assembly in said container during emptying operations.

6. In combination, a detergent dispensing tank having an open upper end, means for closing said open upper end, means for drawing a suction at the interior of said tank during water pick-up operations, a supporting annular shoulder formed on the upper end of said tank, a dirty water collecting bag assembly having a supporting annulus resting on said shoulder and a flexible impervious bag having a closed lower end positioned to float on detergent in said tank and move downwardly therewith as the detergent is dispensed, a rigid ring member, said bag having an open upper end surrounding said ring member, an elastic annular skirt extending downwardly from said supporting annulus and resiliently gripping the material of the open end of said bag to said ring member and a grid structure extending across said ring member to prevent said bag from being sucked upwardly through said ring member.

7. The combination as claimed in claim 6 in which said elastic skirt includes an annular bead of elastic ma-

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terial normally of smaller diameter than said ring member connected to said annulus by an elastic band whereby said bead may be rolled upwardly over said ring member to release the open end of said bag from said ring member.

8. The combination as claimed in claim 6 including baffle means secured to said grid structure and extending downwardly into said bag.

9. The combination as claimed in claim 6 including a vent opening formed in said annulus to equalize the pressures on opposite sides of said bag assembly.

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