

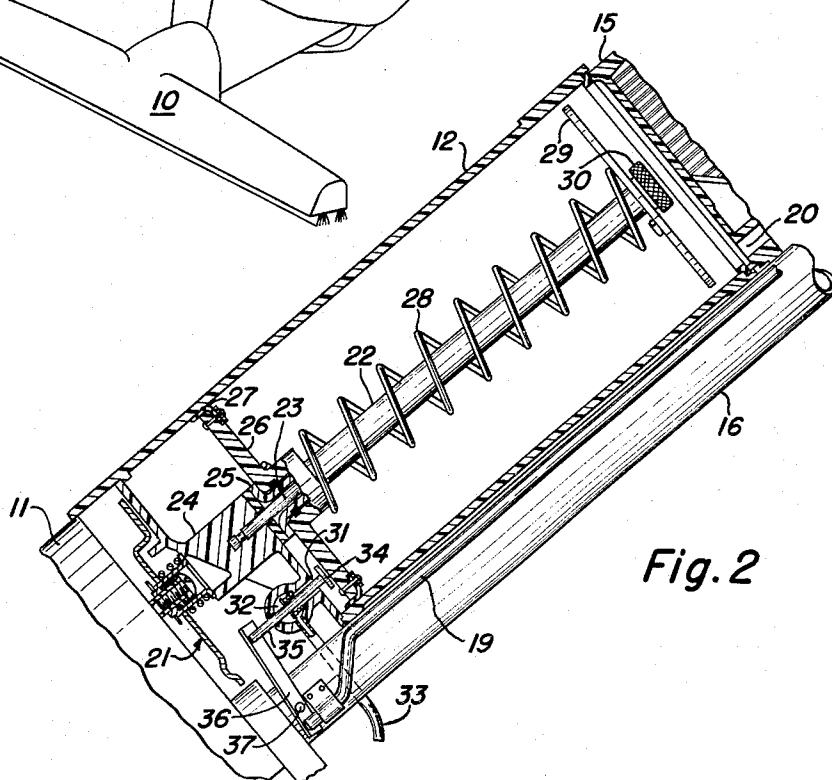
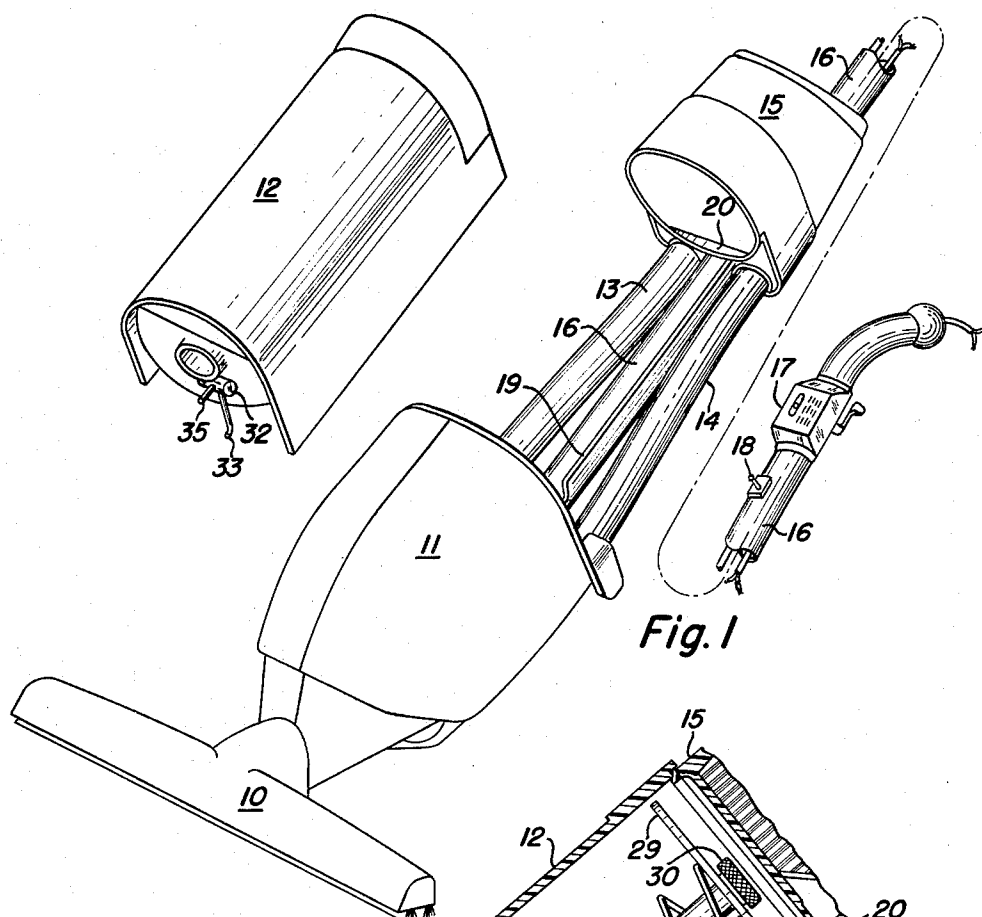
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M. W. HELM
SUCTION APPLIANCE

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2 Sheets-Sheet 1



1

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SUCTION APPLIANCE

Mark W. Helm, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio, a corporation of Ohio

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The present invention relates to suction appliances and more particularly to a water pick-up floor scrubbing appliance which may be used to dispense liquid detergent onto the floor, scrub the floor and to dry the floor by sucking up the dirty water into a special container carried by the appliance.

The appliance of the present invention is a unitary device having all the necessary equipment associated therewith for performing a complete floor scrubbing and drying job. A special combined liquid dispensing and storage container is removably carried by the appliance of the present invention. The container is divided into two variable capacity chambers by a movable partition. At the start of a scrubbing operation the lower chamber is filled with soapy water or other liquid detergent which is dispensed onto the floor before and during the scrubbing operation. As the liquid is dispensed the partition moves downwardly and provides space in the top of the container for receiving dirty water during the water pick-up operation which may occur simultaneously with the scrubbing operation.

The appliance of the present invention relates to the same general type of appliance as disclosed and claimed in a co-pending application by Don C. Krammes, Serial No. 754,093, filed August 8, 1958.

In the appliance disclosed in that application it is intended that the suction unit be operated at all times with the result that a suction is applied over the liquid reservoir which suction must be released during the liquid dispensing operation.

According to the present invention, means is provided for positively forcing the partition in the container downwardly to dispense liquid onto the floor despite the fact that the suction provided by the suction unit tends to prevent such movement. For that purpose a compression spring is provided which acts to force the partition downwardly. A spring of such strength is chosen that it will force the partition downwardly completely to the bottom of the liquid container so that the latter can be substantially completely emptied.

Thus the receptacle forms a triple function in that it provides a storage space for the clean detergent solution and for the dirty water collected during the water pick-up operation and also provides a motive force for dispensing the detergent against the suction of the motor-fan unit.

The receptacle is readily removable from the appliance and the partition is readily removable from the receptacle for ease in emptying the dirty water and in replenishing the detergent solution.

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 the appliance of the present invention showing the storage and dispensing vessel removed from the appliance.

Fig. 2 is a sectional view of the storage and dispensing

2

vessel associated with the appliance and showing the partition in its lowermost position and

Fig. 3 is a view similar to Fig. 2 showing the partition in its uppermost position.

Referring to Fig. 1 of the drawings, the appliance to which the present invention relates includes a suction nozzle 10, a motor-fan unit 11, a dispensing and storage container 12, suction conduits 13 and 14, a water separator 15, a propelling handle 16, a dispensing control 17 and a control switch 18. A valve actuating rod 19 extends downwardly along the handle to actuate the dispensing valve as will be explained hereinafter.

Suction tube 13 is connected between the nozzle 10 and the separator 15 and the suction tube 14 is connected between the separator 15 and the suction inlet of the motor-fan unit 11. Thus when the motor-fan unit 11 is in operation during water pick-up, the mixture of air and water will enter the nozzle 10, pass upwardly through suction tube 13 and into the separator 15 where the water will be separated from the air and drip downwardly from the separator 15 through opening 20. The dry air will continue to the suction side of the motor-fan unit 11 by suction tube 14 and be discharged to atmosphere through a suitable exhaust outlet (not shown).

The container or receptacle 12 is detachably clamped in place between the bottom of the separator 15 and the top of the motor-fan unit 11 by any suitable clamping means such as that shown at 21.

A post 22 is suitably secured to the interior of receptacle 12 by means of a rod 23 having its lower end screw threaded or otherwise secured to a boss 24 extending upwardly through the bottom of the receptacle. The lower end of post 22 is provided with an outstanding flange 25 which rests on top of the boss 24 and provides a stop to limit the downward movement of a piston 26 which is slidably mounted on the post 22 and is provided with a sealing ring 27 which slidably engages the interior of receptacle 12. A sealing ring is also provided between the piston 26 and post 22 as shown.

A compression spring 28 surrounds the post 22 and reacts between the piston 26 and a plate 29 secured to the top of post 22 by means of a nut 30 threaded to the top of pin 23. In the absence of any liquid in the receptacle 12, spring 28 holds the piston 26 against the flange 25 as shown in Fig. 2. The piston 26 can be easily removed by removing the nut 30 and lifting the post 22.

An outlet opening 31 is provided in the rear of the bottom of the receptacle 12 for dispensing liquid from the receptacle. The opening 31 communicates with a small channel 32 formed in a protuberance on the bottom of the receptacle 12 and provided with a dispensing tube 33 for dispensing liquid detergent onto the floor.

The outlet 31 is normally closed by a valve 34, normally spring biased to closed position as shown in Fig. 3. The valve 34 is provided with a stem 35 which extends through the bottom of the protuberance 32 and is provided with a suitable seal as shown in Fig. 3.

The lower end of valve stem 35 is adapted to be engaged by the inner end of an angle shaped lever 36 pivoted at 37 to the supporting framework of the appliance. The rear end of lever 36 is engaged by the lower end of actuating rod 19 to open valve 34 when the control 17 is actuated.

Operation

Clamp 21 is released and the container 12 removed from the appliance. The nut 30 is removed and the post 22 pulled out to remove the piston 26 from the receptacle 12. The valve 34 being closed, the container 12 may then be filled with soapy water or other liquid detergent up to a point just below the threads on the top of pin 23. The piston 23 may then be placed into the

3

container 12 so as to rest on top of the liquid detergent contained therein. Spring 28 is placed around the post 22 and compressed between the piston 26 and plate 29 after which the nut 30 is applied.

The charged container 12 may then be reassembled and clamped between the separator 15 and the motor-fan unit 11.

The motor-fan unit may then be energized by actuation of the switch 18 and the appliance moved to the scene of operation. As the appliance is manipulated, the water control 17 is intermittently actuated to move the rod 19 downwardly to open the valve 34 and dispense liquid detergent through the tube 33 onto the floor at the rear of the nozzle 10. The valve 34 is opened intermittently as liquid detergent is needed both before and during the scrubbing operation.

The energization of the motor-fan unit 11 will produce a vacuum in the water separator 15 which will be reflected through opening 20 into the top of container 12 above the piston 26. However, the strength of the spring 28 is such that the piston 26 is moved downwardly so as to follow the liquid level as the liquid detergent is dispensed from beneath it.

After liquid detergent has been dispensed over a suitable area of the flooring and that area thoroughly scrubbed, actuation of the dispensing control is stopped and the appliance moved to a new area to be scrubbed.

Since the motor-fan unit 11 is in operation during the scrubbing operation, dirty water will be picked up by the moving air stream at the nozzle 10 during the scrubbing operation.

The water laden air stream will pass by suction tube 13 to the water separator 15 where the water will be separated out of the air stream and trickle downwardly through the opening 20 into the top of container 12 above the piston 26 and fill the space provided by the downward movement of piston 26 as the liquid level in the lower part of container 12 falls due to the liquid detergent being dispensed.

When all the liquid detergent has been dispensed the parts will assume a position shown in Fig. 2 at which time the container 12 may be removed from the appliance, the dirty water dumped from the space above the piston 26 and the liquid detergent replaced as previously described.

From the foregoing it can be seen that the present invention provides a self-contained scrubbing appliance having all the necessary facilities for dispensing a detergent solution onto the floor, for scrubbing the floor and for drying the floor in which the suction unit operates continuously and the drying operation is performed while and during the time the floor is being scrubbed.

It can also be seen that the present invention provides a special container for floor scrubbing appliance which performs a triple function in providing a variable storage space for the liquid detergent which becomes smaller as the liquid detergent is dispensed, in providing a variable

4

storage space for dirty water picked up from the floor which becomes larger as the dirty water is collected and in providing positive means for applying pressure to the detergent liquid for dispensing it against atmospheric pressure when the suction unit is in operation.

The invention also provides a special liquid receptacle for floor scrubbing appliance in which the receptacle may be made quite small and yet provide ample storage space for a comparatively large quantity of liquid detergent and a comparatively large storage space for dirty water picked up from the floor as it is scrubbed.

While I have shown and described but a single embodiment of my invention it is to be understood that that embodiment is to be taken as illustrative only and not in a limiting sense. I 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.

I claim:

1. A scrubbing appliance comprising, a suction nozzle, suction creating means, a detergent container, a water separator, conduit means for connecting said suction creating means to said water separator and said water separator to said nozzle, said detergent container being in suction communication with said water separator, means for dispensing a liquid detergent from said detergent container onto the floor, a movable partition within said container adapted to rest on top of the liquid detergent and sealing the upper and lower spaces of said container from each other, means for applying a pressure to the top of said partition to force liquid detergent out of said dispensing means in opposition to the suction produced in said container by said suction creating means and means for leading liquid picked up at said nozzle and separated in said water separator into the top of said container above said partition whereby dirty water may be stored above said partition at the same time that liquid detergent is stored below said partition.

2. A scrubbing appliance according to claim 1 including means for detachably attaching said container to said appliance and means for detachably securing said partition within said container whereby said container may be readily removed from said appliance for emptying dirty water collected above said partition and said partition may be readily removed from said container for replenishing the supply of detergent solution beneath said partition.

References Cited in the file of this patent

UNITED STATES PATENTS

995,769	Coleman	June 20, 1911
1,585,538	DeLoach	May 18, 1926
1,687,283	Deutscher	Oct. 9, 1928
1,892,347	Jerome	Dec. 27, 1932
2,333,829	Terry	Nov. 9, 1943