

April 14, 1936.

I. H. MARANTZ
WASHING APPLIANCE ADAPTED TO THE BLOWER
PORTIONS OF A VACUUM CLEANER DEVICE
 Filed Oct. 28, 1932 29

2,037,525

2 Sheets-Sheet 1

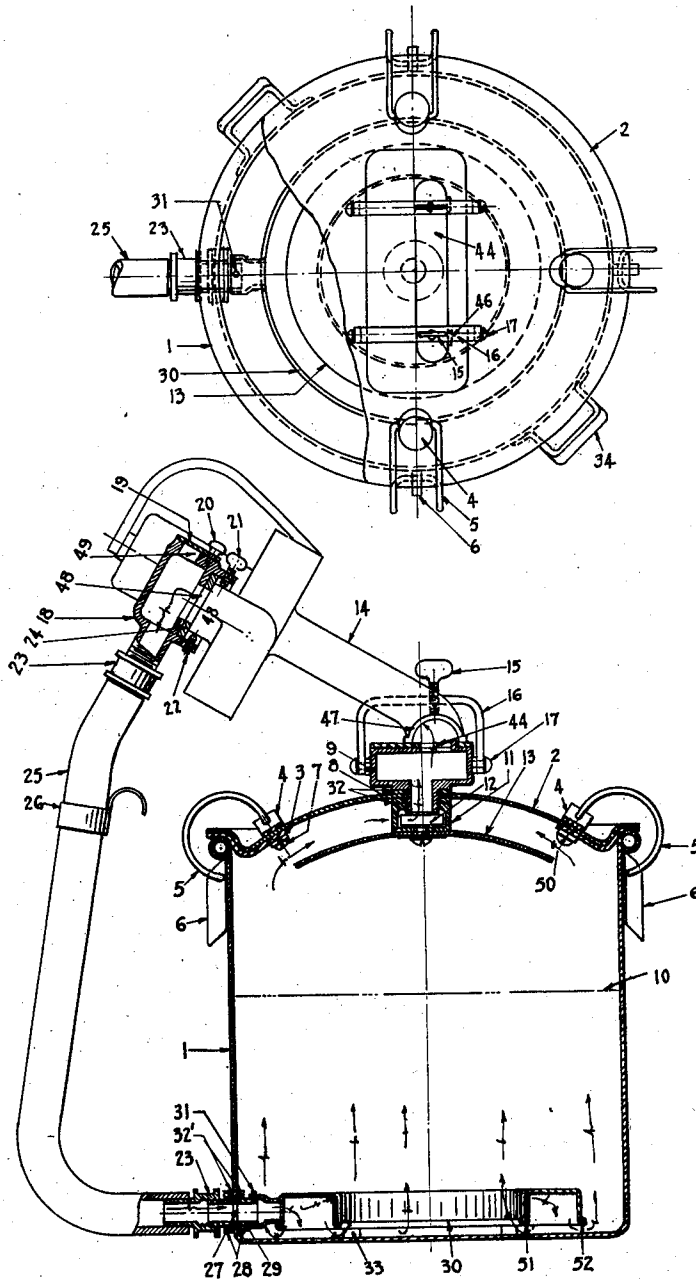


FIG. 2.

FIG. 1.

Israel H. Morantz
INVENTOR

BY 
ATTORNEY

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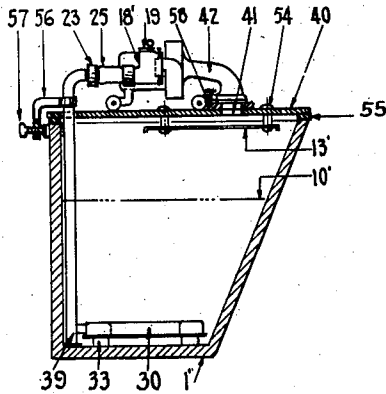


FIG. 4.

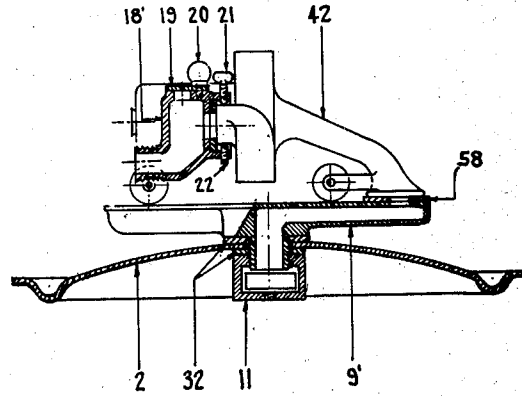


FIG. 5.

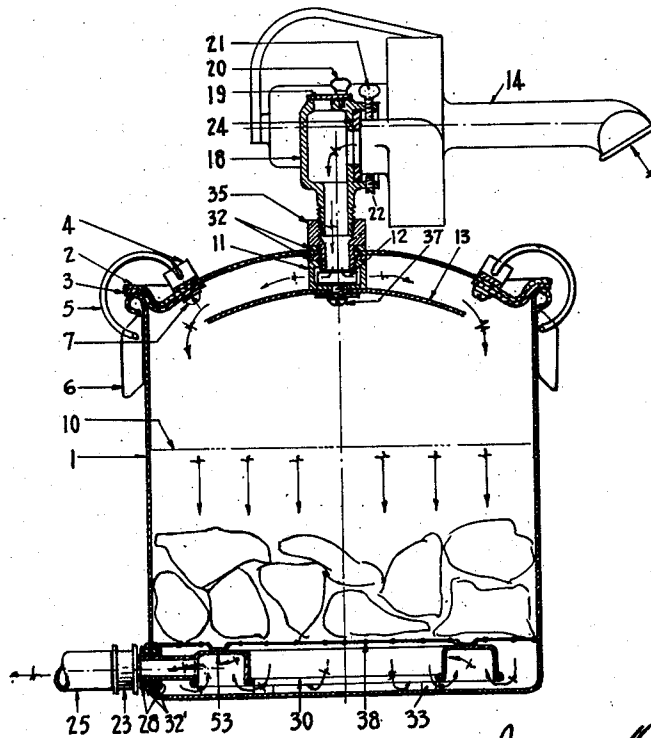


FIG. 3

I. H. Marantz
 INVENTOR

BY *Herbert Satter*
 ATTORNEY

UNITED STATES PATENT OFFICE

2,037,525

WASHING APPLIANCE ADAPTED TO THE
BLOWER PORTIONS OF A VACUUM
CLEANER DEVICEIsrael H. Marantz, New York, N. Y., assignor of
seventy-five per cent to L. Stewart Gatter,
New York, N. Y.

Application October 28, 1932, Serial No. 640,034

4 Claims. (Cl. 68—37)

My invention relates to washing machines, and particularly to that class in which a fan operated vacuum cleaning machine is used to agitate the washing liquid. Whereas in the past, vacuum cleaning machines were used to operate reciprocating mechanisms which in turn agitated the washing liquid, it is my aim to directly circulate the air through the washing liquid, in a manner fully described below, thus providing an efficient method of washing clothes, dishes, etc., without using any other moving parts than those already incorporated in the vacuum cleaning machine.

It is an object of my invention to provide an inexpensive washing device, thereby increasing the utility of the vacuum cleaning machine. It is a further object of my invention to provide a portable washing machine that can be placed upon a stove and the water heated, that can readily be filled and drained, that can be adjusted to vary the degree of agitation, and that can dry the clothes, all as substantially hereinafter shown and described. Other and further objects will hereafter appear.

In the accompanying drawings, Figure 1 is a transverse vertical section of my washing device showing the vacuum cleaning machine in position. Figure 2 is a plan view of the same without the vacuum cleaning machine in position to more clearly disclose the construction. Figures 3 and 5 are transverse vertical sections of a modification of the same. Figure 4 shows the application of the washing device where the receptacle is replaced by an ordinary tub. Figure 5 is a section showing an application of my washing device.

The invention comprises a cylindrical receptacle or container 1, made of suitable material to hold a quantity of washing fluid in which the articles to be cleansed are immersed, and cover 2, for closing this receptacle so as to make it practically air tight; this being accomplished by means of clamping arrangements 4, 5, 6, and 7; hereafter designated as the cover clamping device, compressing gasket 3 at convenient points along the periphery of the cover. In the cover clamping device, the semi-elliptical steel spring 5 is pivoted in stud 4 which is secured to the cover by screw 7 through gasket 3 (cover is held tight against receptacle rim by additional force exerted when air is sucked from underside of cover); the spring 5 is elongated by cam 6, using rim 43 as a fulcrum, thereby compressing gasket 3, between the cover 2 and receptacle 1. This means of tightly fastening the cover 2 to receptacle 1 is used to make possible the use of an

inexpensive cover and container. It is obvious that the clamping device will vary with the type of cover and container used, such changes in design cannot materially effect the workings of my washing device. Attached to cover 2, is suction head 9, which passes through hole 8 and is secured to cover 2, by means of locknut 11 compressing gasket 32 thereby making the joint tight. Locknut 11 is arranged with slots 12 thus providing a continuous passageway between the interior of the receptacle 1, and opening 44 in suction head 9. Baffle plate 13 is secured to locknut 11, by means of a screw.

Centrally located at the bottom of the receptacle 1 is an inverted U-shaped ring, hereinafter referred to as the "agitating ring" 30 which is spaced from the bottom of the receptacle by means of legs or spacers 33 fastened or soldered to agitating ring 30. Threaded tube 29 is tightly secured to agitating ring 30 by means of set screw 3 and passes through receptacle (this set screw arrangement makes it possible to facilitate cleaning receptacle and ring) through hole 27 and is secured to the receptacle by means of locknuts 28 compressing gaskets 32'. Threaded tube 29 is arranged to receive hose coupling 23 to which flexible hose or tube 25 is tightly connected. At the other end of hose 25 is fastened another hose coupling 23, both being interchangeable, to which is connected the air flow regulation or relief valve 18, which can be regulated by sliding of solid disc 19 about thumb screw 20 disclosing more or less of opening 49 in the air flow regulator 18. The air flow regulator is arranged with set screws 22 and thumb screw 21 to fit any diameter of vacuum cleaning machine discharge, the joint being made tight by means of gasket 24. The suction end or nozzle 47 of the vacuum cleaning machine is tightly secured to suction head 9 by means of thumb screw 15 screwing down on suction end 47 through clamp 16 which is pivoted to suction head 9 through bolts 17. Clamp 16 swings about 17 making it easy to remove suction nozzle 47. This arrangement is universal for any shape or size of suction nozzle.

Air circulation is now made possible as follows: air is sucked from the upper portion of receptacle 1 through opening 12 into suction head 9 through opening 44 into suction nozzle 47, through vacuum cleaning machine fan, through discharge into air flow regulator 18, with an air by-pass at opening 49, through flexible hose 25 through tube 29 into U-shaped agitating ring 30, leaving it at edges 51 and 52 to re-enter receptacle 1.

The principle of operation is as follows: A vac-

uum cleaning machine 14, after being operated, without the dust bag, a short time to clear the machine of any latent dust is ready to be used in the washing cycle. The suction nozzle 47 is placed on suction head 9 so that it completely covers opening 44, then is clamped into position by means of thumb screws 15. Likewise, air flow regulator 18 is tightly fastened into position by tightening thumb screw 21, set screws 22 being preset for the size of discharge opening. The washing machine is now ready for use. The cover 2 is removed with the vacuum cleaning machine attached, the material to be cleansed is inserted in the receptacle and water added, either by pouring the water over the open top of the receptacle 1 or else by means of flexible tube 25 to the height of the water line 10 in the receptacle, approximately 7 inches. However, if too much water has been added the surplus can readily be drained by means of flexible tube 25, which when not in use is hooked on handle 34 by means of hose hook 26 to prevent draining of contents. The use of same tube for air flow and drain is fool-proof against draining while machine is in washing operation.

With receptacle 1 now filled with water and washing fluid to the proper level cover 2 together with the attached vacuum cleaning machine 14 is clamped into position through its clamping device and flexible tube 25 is coupled to the air flow regulator 18 through coupling 23. The vacuum cleaning machine 14 is then started effecting the recirculation of air and steam in the following manner. Air and steam is drawn from the upper portion of the receptacle 1 into the vacuum cleaning machine through suction head 9, and discharged through opening 48 forcing the air and steam through air flow regulator 18 down tube 25 and into the agitating ring 30, air then being forced out at varying points along its inside edge 51 and outside edge 52, returning air and steam to the upper portion of receptacle 1 thru the washing fluid and contents. The air leaving the outside edge 52 of the agitating ring 30 throws the material and washing fluid toward the center of receptacle 1 while the air leaving the inside edge 51 throws the material and washing fluid toward the receptacle wall, thereby giving a to and fro motion to the contents, in addition to the action of the air in its vertical travel, forcing soap suds thru the material; this latter action thoroughly looses the dirt from pores of the material while the former washes the dirt from the material and keeps it in suspension to be removed when the washing liquid is thoroughly discarded. It is desirable to vary the force of this agitation, making it weaker for fine fabrics and stronger for heavier and coarser fabrics, and for this purpose the air flow regulator 18 was devised. The operation of the air flow regulator is simple; thumb screw 20 is unloosened allowing a lateral motion to valve disc 19, as this valve disc is slid to expose more of opening 49, less air reaches the agitating ring 30, passing less air through the receptacle; likewise as less of the opening 49 is exposed, more air reaches the agitating ring passing more air through the contents and the receptacle causing more agitation as described. Furthermore, when vacuum cleaning machines are too powerful, a pressure is built up in the fan casing which cannot be entirely relieved by the agitating ring in which case air and steam tend to leak out from other

sources, such as fan bearings, etc.; to avoid this the air flow regulator 18, can be used as a relief valve by adjusting valve disc 19, until any such leaks if present are eliminated. Baffle plate 13 is used to avoid an excess of washing liquid from being carried over into the vacuum cleaning machine.

I find that approximately 15 minutes, more or less, is required for a complete washing operation, depending upon the nature of the materials being washed, the cleansing agent used and whether hot or boiling water is used. The washing operation completed, the flexible tube 25 is disconnected from the vacuum cleaning machine, at the regulator end, and the water drained through 25, and rinse water added. The rinsing operation is accomplished in the same manner as the washing operation. The rinsing can be repeated as often as desired for best results, the vacuum cleaning machine being operated only a few minutes for each rinsing.

Although the arrangement shown uses what is known as a handy size vacuum cleaning machine, the suction head 9 can readily be increased in size and shape to support and connect to any type of vacuum cleaning machine, or air circulating fan.

Figures 3, 4, and 5 illustrate a few minor modifications of the washing device. In Figure 3, the set up is similar to that already described except that suction head 9 is arranged to be unscrewed from coupling 35 which is secured to cover 2 by means of locknut 11 and gasket 32. By this means air flow regulator 18 can be interchanged with suction head 9. With air flow regulator in new position shown it becomes possible to damp dry the clothing as follows: Prior to the washing operation previously fully described, the coarsely woven wire disc 38 is secured to agitating ring 30 by means of screws 53. The introduction of this coarsely woven disc does not effect the washing operation as described. Likewise the material is thoroughly washed, rinsed and water drained as fully scribed. The suction head 9 is then removed and replaced by air flow regulator 18 and the vacuum cleaning machine fastened to 18 by tightening thumb screw 21, leaving suction nozzle 47 exposed to the atmosphere. The valve disc 19 is kept in a closed position. The vacuum cleaning machine is started, forcing dry air into the upper part of the receptacle 1. This air pressure compressed the clothes against wire disc 38 thereby forcing the water down and out through drain hose 25. Continued operation of the vacuum cleaning machine causes fresh dry air to pass through the material carrying the moisture along with it. The degree of drying depends entirely upon the temperature and quantity of air passed through the material.

As stated, Figure 4 shows the application of the washing device where the receptacle is replaced by an ordinary tub. The arrangement of parts and principle of operation remain the same, except rigid tube 39 replaces flexible tube 25 since draining is no longer a problem, with arrangements on tube 39 so that it rigidly keeps the agitating ring in position. Likewise, that the agitating ring must be increased in size and I find that for best results, the agitating ring should be about one fifteenth the working volume; by working volume being meant the space occupied by the washing liquid and contents, the working volume never exceeding two thirds the total volume of the container.

It must be understood that although the device is shown adapted to operate with any commercial type vacuum cleaner, I may utilize my general structure of the cleaner or working portion with a motor blower or air circulating device especially built for the particular receptacle and adapted to be mounted and connected to the cover thereof in lieu and in place of the blower portion of any commercial vacuum cleaner device.

What I claim and desire to secure by United States Letters Patent is:

1. A washing appliance adapted for combination with the blower portion of a vacuum cleaning device, comprising a washing receptacle, a cover for said receptacle, a suction chamber in said cover in communication with the receptacle, means for supporting said vacuum cleaning device by said cover and for connecting the suction nozzle of said vacuum cleaning device to said suction chamber, tubular means for connecting the discharge outlet of said vacuum cleaning device to an inlet in the lower portion of said receptacle.

2. A washing appliance adapted for combination with the blower portion of a vacuum cleaning device as claimed in claim 1 characterized by an auxiliary air flow regulator relief valve disposed in said tubular means connected to the discharge side of said cleaner.

3. A washing appliance adapted for combina-

tion with the blower portion of a vacuum cleaning device as claimed in claim 1 characterized by an air agitator and circulating plate ring centrally disposed at the bottom of said receptacle and in spaced relationship therewith adapted to circulate the air both centrally the receptacle and circumferentially thereof.

4. A washing appliance adapted for combination with the blower portion of a suction producing device, a receptacle, a substantially air tight receptacle cover, an air baffle plate spaced inwardly of said cover, a suction chamber in said cover, means for supporting and positioning a suction producing device on said cover with the suction nozzle thereof connected to said suction chamber, an auxiliary air flow regulator relief valve disposed on said discharge side of said suction producing device and operatively connected to a tubular hose, the latter also connected to the lower portion of said receptacle and to an air agitating and circulating plate ring centrally disposed in the bottom of said receptacle adapted to circulate air, both centrally the receptacle and circumferentially thereof, a coarse mesh screen disposed on the top of said plate ring, the whole operatively adapted to provide a substantially air tight unrestricted controlled air flow circulation in said receptacle.

ISRAEL H. MARANTZ. 30