

June 23, 1953

R. P. SAFFIOTI
PORTABLE FLOOR CLEANING DEVICE WITH
SPONGE COVERED CLEANING ROLLER

2,642,601

Filed Aug. 31, 1951

2 Sheets-Sheet 1

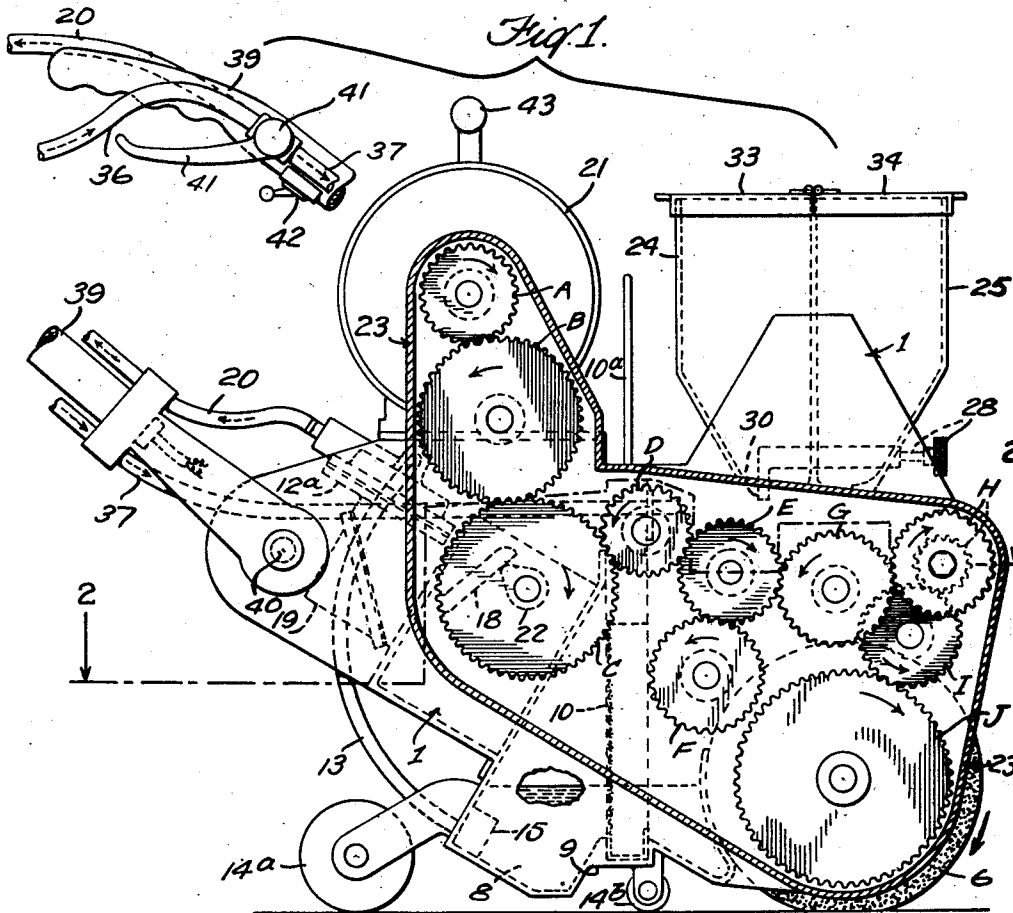
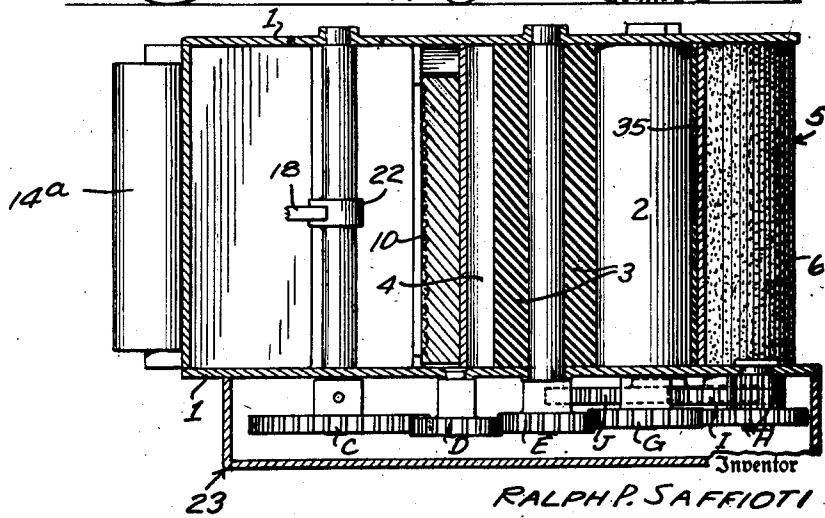


Fig. 2.



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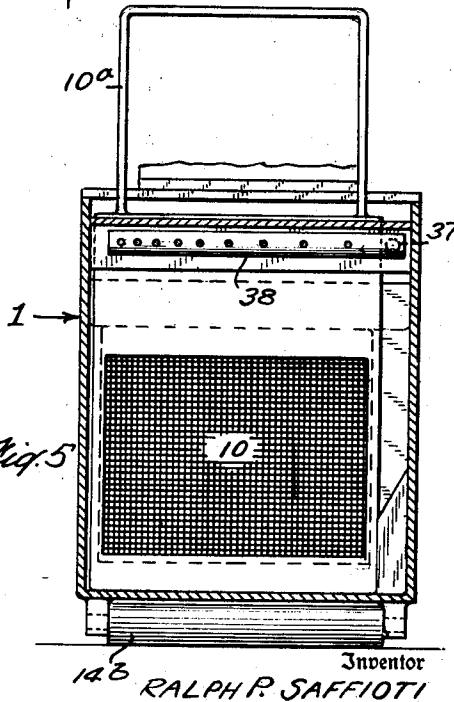
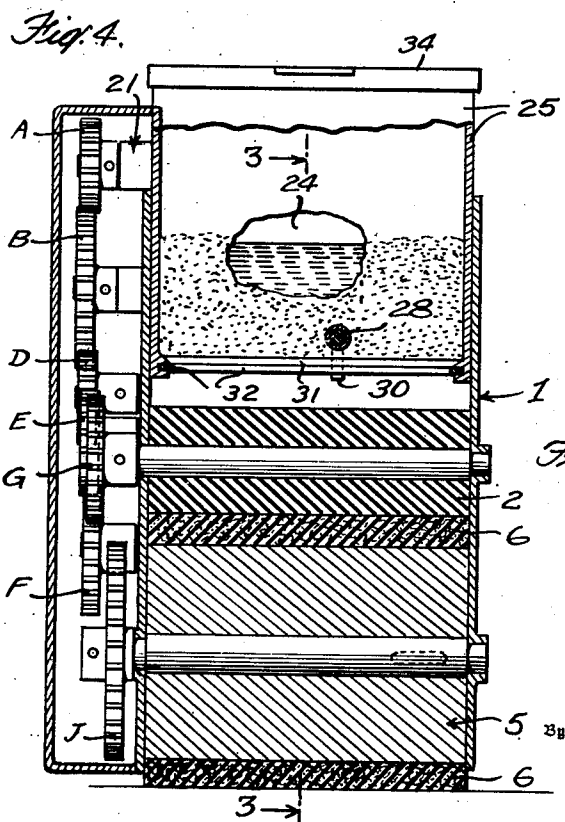
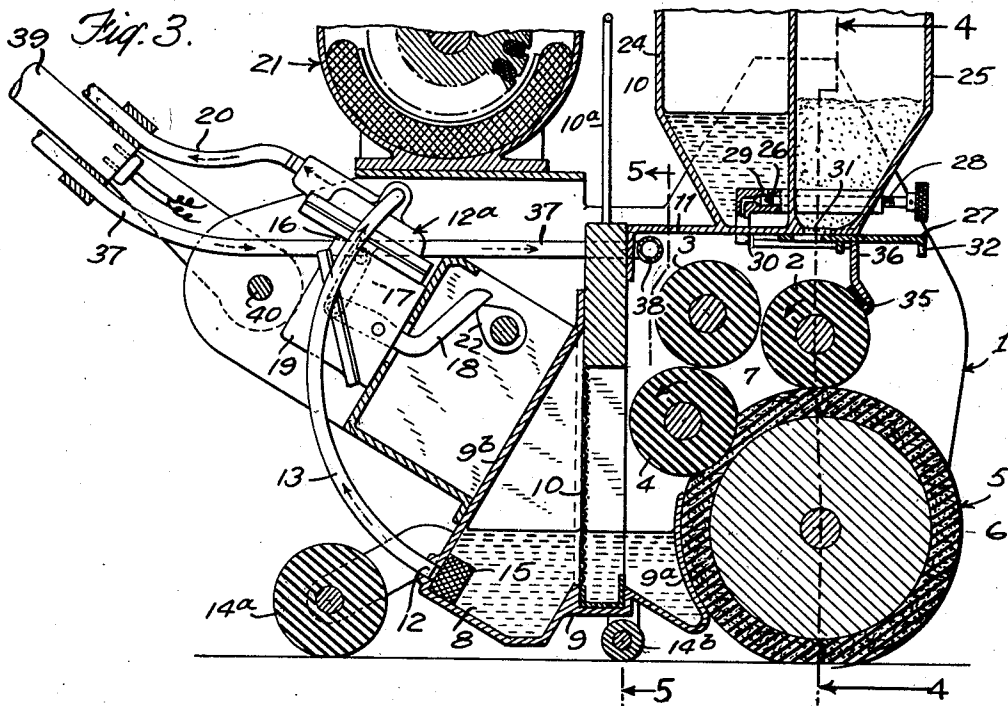
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UNITED STATES PATENT OFFICE

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PORTABLE FLOOR CLEANING DEVICE WITH
SPONGE COVERED CLEANING ROLLER

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Application August 31, 1951, Serial No. 244,624

7 Claims. (Cl. 15—98)

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This invention relates to a portable cleaning device which is especially adapted for use in cleaning rugs and floors.

An object of the invention is to provide a lightweight apparatus which can be easily operated under manual control to moisten the surface to be cleaned with a controlled amount of soapy water and to scrub and polish the surface, simultaneously disposing of the dirty water.

Other objects and advantages of the invention will appear from the following description.

To accomplish this, I provide a portable cleaner of the rotative cleaning roller type in which a moistened sponge covered roller is power driven in contact with the surface to be cleaned, water and soap in controlled quantities being delivered to the roller.

One of the features of the invention resides in the employment of cooperative rubber rollers which are also power driven and which are properly related to the cleaning roller and to each other to maintain water with or without soap in wetting contact with the sponge covered roller and to control the degree of wetness and to express the dirty water from the sponge covering.

The invention also comprehends other features of construction, including a novel pumping arrangement to remove the dirty water, and novel means for manual control of the delivery of water and soap to the cleaning device.

In general the cleaning device consists of an assembly of a power driven, sponge covered cleaning roller the diameter of which increases with the absorption of water, and two cooperative rubber rollers driven at the same peripheral speed as that of the cleaning roller, properly spaced with reference to the cleaning roller to express the dirty water from the sponge covering and to control the degree of wetness of the sponge material for its cleaning function. The space between these two cooperating rollers constitutes a water chamber to which clean water and soap are delivered under manual control, a third rubber roller being disposed in close proximity to the first two so as to form a top closure for the water chamber and being driven at an angular rate such that its peripheral speed preferably exceeds that of the other rollers.

The expressed dirty water is collected in a sump from which it is pumped by means under the control of the power means and may be disposed of in any convenient manner.

I shall now describe the illustrated embodiment of the invention and shall thereafter point out my invention in appended claims.

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Fig. 1 is a side elevation with certain parts in section and other parts broken away of the cleaning device showing the means employed to drive the pump and the rollers;

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary vertical section of the cleaning device taken on the line 3—3 of Fig. 4;

Fig. 4 is a vertical end section of the cleaning device taken on the line 4—4 of Fig. 3; and

Fig. 5 is a vertical section showing the screen taken on the line 5—5 of Fig. 3.

In referring by reference characters to the accompanying drawings the numeral 1 indicates the casing of the cleaning device in the inner face of which are rotatably mounted delivery rollers 2 and 3, a squeezing roller 4 and a cleaning roller 5 having a sponge covering 6. The cleaning device is illustrated as in operation; the sponge covering 6 on the surface of the cleaning roller is, therefore, wet and expanded, and is firmly engaged by the squeezing roller 4 and in contact with delivery roller 2 thus controlling the degree of wetness of the cleaning roller. The surface of the delivery roller 2 is disposed closely adjacent to the delivery roller 3 which is above and in close proximity to the squeezing roller 4. The region which is substantially bounded by the two delivery rollers, the squeezing roller and the cleaning roller constitutes a water chamber 7. The delivery roller 3 is preferably driven at a slightly higher rate of rotation than the delivery roller 2 the desired effect of which is to remove small foreign particles from the squeezing roller and to draw off between the delivery roller and the squeezing roller some of the dirty water which passes the point of squeezing engagement of the squeezing and cleaning rollers and enters the water chamber 7.

The lower region, which is delimited by the casing 1, bottom plate 9, forward plate 9a and the rear plate 9b, is designated the sump 8 which collects the dirty water that is squeezed from the cleaning roller. The front plate 9a and the rear plate 9b are integral with the bottom plate 9 of the sump and the front plate is in arcuate contact with the cleaning roller when the sponge covering 6 is wet and expanded. The approximate middle portion of the bottom plate 9 is designed to receive a screen 10 which extends between the two sections of a top plate 11 of the cleaning device. The purpose of the screen is to filter the larger particles and prevent them from reaching and possibly obstructing an outlet opening 12. The top of the screen 10 is provided with a screen handle 10a for vertical re-

moval of the screen. As shown in Figs. 1 and 3 there are affixed to the rear plate 9b and bottom plate 9 anti-friction supports, 14a and 14b which in combination with the cleaning roller support the cleaning device.

Located in the lower portion of the rear plate 9b is the outlet opening 12 which is protected by a strainer 15 and is connected to the intake valve of pump 12a by flexible conduit 13. As illustrated the pump 12a is a standard diaphragm pump used in conventional automotive practice as a gasoline pump. A housing 16 is mounted on the lower or diaphragm side of the pump 12a to house a vertical link 17 which oscillates the diaphragm and which is driven by a cam follower 18. The housing 16 is provided with a closure 19 which is removable in order to expose the interior of the pump 12a for maintenance and adjustment. The dirty water is expressed from the pump into an outlet hose 20 by means of which the water is fed to any convenient depository.

The means for operating the pump and driving the rollers will now be described although it will be understood that by doing so the applicant does not thereby intend to limit himself to the particular construction illustrated and described.

The pinion A is mounted on the armature of motor 21 and drives a series of gears B, C, D, E, F and G and the outer gear of a compound gear H. Mounted on the shaft of gear C is a cam 22 which imparts oscillating movement to the diaphragm of the pump 12a through vertical link 17 and cam follower 18. Mounted on the shafts of gear E, G and F are the delivery rollers 3 and 2 and the squeezing roller 4 respectively. A gear E is slightly smaller than gears F and G to provide for a higher rotative speed for delivery roller 3 than the delivery roller 2 and the squeezing roller 4. The inner gear of compound gear H engages idler gear I which in turn drives a large gear J. Mounted on the shaft of gear J is the cleaning roller 5. Gears E and G are driven in clockwise and counter-clockwise directions respectively. The adjacent areas of delivery rollers 3 and 2 accordingly move downwardly. Gears J and F are driven in clockwise and counter-clockwise directions respectively causing the contiguous areas of squeezing roller 4 and cleaning roller 5 to move upwardly. All the gears are protected by gear housing 23.

Powdered or liquid soap is delivered into the region immediately above the delivery rollers 2 and 3 from soap tanks 24 and 25 through a needle valve 26 for the liquid soap and through a slide valve 27 for the powdered soap. A screw needle 28 is adapted to alter the size of an opening 29 in the needle valve 26. Nozzle 30 leads from the opening end of the needle valve into the chamber above the delivery rollers. This chamber is also in communication with the soap tank 25 by virtue of an aperture 31 the size of which can be changed by sliding a flat hook piece 32. The hinged covers 33 and 34 atop soap tanks 24 and 25 respectively, can be raised when it is desired to fill the tanks. The soap and water is precluded from spilling over the forward portion of the delivery roller 2 by a rubber seal 35 secured in the bottom hook portion of a plate 36 in contact with the delivery roller 2.

Water is brought into the cleaning device by inlet hose 37 one end of which is attached to any convenient source of water supply and the other end is attached to a perforated pipe 38

which sprays the water into the chamber above the delivery rollers.

A pole handle 39 is fixed to a shaft 40 which is pivotally mounted between the end portions of side plates 1. A water valve 41 is stationed within convenient hand reach of the end portion of the pole handle and is for the purpose of controlling the quantity of water admitted to the cleaning device. Also, within convenient reach is a hand switch 42, which is in electrical connection with the motor 21 and turns on and off the motor 21.

Affixed to the top of the motor 21 is a grip 43 which consists of a cylindrical bar mounted on two flat pieces which are affixed to the motor. The combination of the grip 43 and the handle 39 increases the portability and mobility of the cleaning device when not in actual operation.

It is obvious that modifications may be effected by those skilled in the art in the above described apparatus embracing my invention within the scope of the following claims.

What is claimed is:

1. A portable cleaning device comprising a casing having anti-friction supports and movable over a surface to be cleaned, a sponge covered cleaning roller bearing in and protruding through the bottom of the casing and proportioned when wet to engage the surface, a squeezing roller mounted wholly within the casing in contact with the cleaning roller, means to drive the cleaning and the squeezing rollers in opposite directions with their contiguous areas moving upwardly, a pair of delivery rollers mounted in close proximity in the casing above the cleaning and squeezing rollers with one contacting the cleaning roller and the other in close surface proximity to the squeezing roller, a water chamber being formed and substantially bounded by the two delivery rollers, the squeezing roller and the cleaning roller and means to drive the delivery rollers in opposite directions with their adjacent areas moving downwardly.

2. A portable cleaning device comprising a casing having anti-friction supports and movable over a surface to be cleaned, a sponge covered cleaning roller bearing in and protruding through the bottom of the casing and proportioned when wet to engage the surface, a squeezing roller mounted wholly within the casing in position to engage the cleaning roller when the sponge covering is dry, means to drive the cleaning and squeezing rollers in opposite directions with their contiguous areas moving upwardly, a pair of delivery rollers mounted in close proximity in the casing above the cleaning and squeezing rollers with one disposed in contact relation to the cleaning roller when the sponge covering is wet and the other disposed in close surface proximity to the squeezing roller, a water chamber being formed and substantially bounded by the two delivery rollers, the squeezing roller and the cleaning roller, means to drive the delivery rollers in opposite directions with their adjacent areas moving downwardly, and means to deliver water to the space immediately above the delivery rollers.

3. A portable cleaning device comprising a casing having anti-friction supports and movable over a surface to be cleaned, a sponge covered cleaning roller bearing in and protruding through the bottom of the casing and proportioned when wet to engage the surface, a squeezing roller mounted wholly within the casing in position to engage the cleaning roller when the sponge cover-

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ing is dry, means to drive the cleaning and squeezing rollers in opposite directions with their contiguous areas moving upwardly, a pair of delivery rollers mounted in close proximity in the casing above the cleaning and squeezing rollers with one disposed in contact relation to the cleaning roller when the sponge covering is wet and the other disposed in close surface proximity to the squeezing roller, means to drive the delivery rollers in opposite directions with their adjacent areas moving downwardly, means to deliver water to the space immediately above the delivery rollers and means to deliver soap on to the top of one of said delivery rollers.

4. A portable cleaning device as in claim 2 wherein the said delivery roller which is disposed in close surface proximity to the squeezing roller is driven at a higher rotative speed than the other said delivery roller.

5. A portable cleaning device comprising a casing having anti-friction supports and movable over a surface to be cleaned, a sponge covered cleaning roller bearing in and protruding through the bottom of the casing and proportioned when wet to engage the surface, a squeezing roller mounted wholly within the casing in position to engage the cleaning roller when the sponge covering is dry, means to drive the cleaning and squeezing rollers in opposite directions with their contiguous areas moving upwardly, a pair of delivery rollers mounted in close proximity in the casing above the cleaning and squeezing rollers with one disposed in contact relation to the clean-

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ing roller when the sponge covering is wet and the other disposed in close surface proximity to the squeezing roller, means to drive the delivery rollers in opposite directions with their adjacent areas moving downwardly, means to deliver water to the space immediately above the delivery rollers, a plurality of soap tanks, and manually controlled means to deliver the soap in the desired form from the soap tanks to the space immediately above the delivery rollers.

6. A portable cleaning device as in claim 2 having a sump beneath the squeezing roller and pumping means to evacuate the said sump and feed its contents to the outside of the cleaning device.

7. A portable cleaning device as in claim 6 having a screen disposed within the cleaning device and in the region between the point of engagement of the squeezing and cleaning rollers and the outlet opening of the sump.

RALPH P. SAFFIOTI.

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