March 13, 1962 W. P. WALLACE 3,024,484

RUG SHAMPOOING MACHINE

Filed Aug. 19, 1960

FIG. 1.

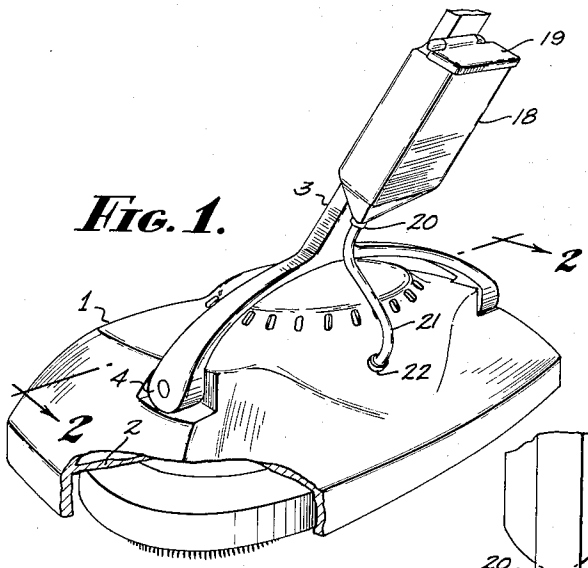
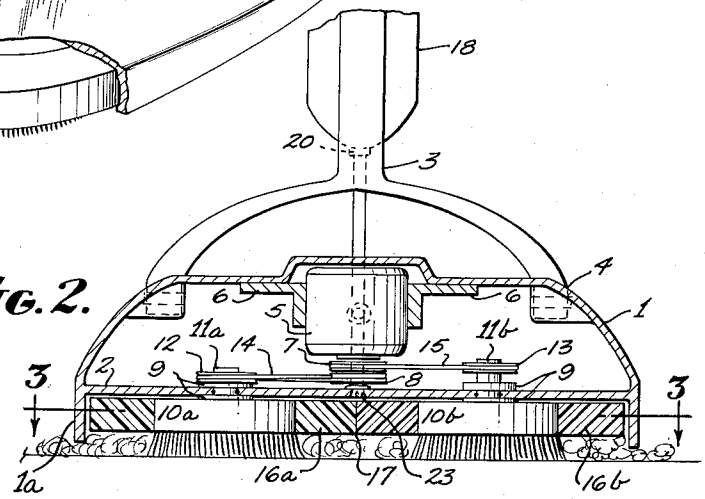


FIG. 2.



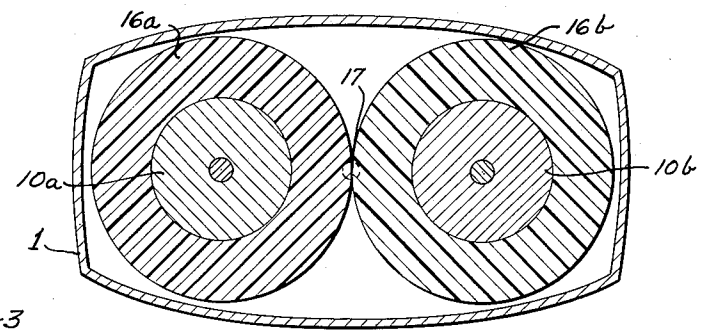
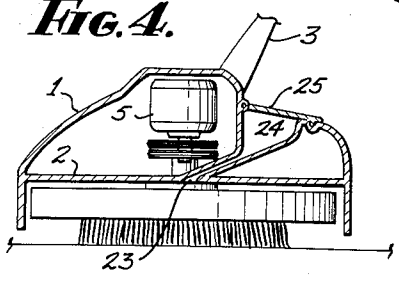


FIG. 3.

FIG. 4.



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RUG SHAMPOOING MACHINE

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This invention relates to a machine for shampooing rugs, carpets, and the like, and relates more particularly to a device wherein a high foaming detergent is aerated into foam prior to its application to the rug being cleaned.

The majority of rug cleaning devices available today are provided with brushes arranged to contact and scrub the rug or carpet; and the devices are provided with a container for supplying a detergent solution, the solution being metered directly onto the rug, whereupon it is worked into a lather by the action of the brushes. Rugs cleaned in this manner require many hours and even days to dry thoroughly because of the penetration of moisture into the body of the rug. Mildewing and molding of the rug often results; and furniture ferrules may leave rust spots which would permanently impair the appearance of the rug.

In order to overcome the inherent difficulties of this wet scrubbing or shampooing of rugs, carpets, and the like, I have developed a "dry" shampooing device and technique as disclosed in my co-pending application, Serial No. 858,473, filed December 9, 1959, and entitled Rug Shampooing Device. In that application, I taught the use of a wheeled tank containing sponge-like rollers for generation of an essentially dry foam, and the application of the foam as such to the carpet being cleaned, whereupon it is subjected to the scrubbing action of a set of stationary brushes mounted on the bottom of the device. This arrangement has been found to be highly effective to clean rugs, carpets or the like without unduly wetting the material being cleaned and producing excessive moisture.

I have now discovered an improved device embodying those basic principles, but employing rotary type brushes and an independent source of power for more efficient scrubbing. The brushes and foam generating means are coupled in such a way that a single drive unit operates them both. This device has the added advantage that it is easily converted for use as a floor waxer or polisher.

In view of the foregoing considerations, it is a fundamental object of the instant invention to provide a rug cleaning machine wherein a single driving unit can be utilized both to generate an essentially dry foam before its application to the rug or carpet being cleaned, apply the foam so generated, and thereafter attain a highly efficient scrubbing action.

A further object of the invention is the provision of a rug cleaning machine combining rotary scrubbing brushes and a foam generating means in such a way that by the rotation of the brushes, an essentially dry foam is generated and applied to the carpet or the like being cleaned.

Still a further object of the instant invention is to combine the rotary brushes and the foam generating means in such a way that the entire device retains its efficiency while being made more compact.

Still another object of the invention is to provide a simple and inexpensive rug cleaning device which in use, can freely pass over a freshly cleaned portion of a rug or carpet without leaving any tracking marks.

These and other objects of the invention which will be pointed out in more detail hereinafter, or which will be apparent to one skilled in the art upon reading these specifications, I accomplish by that construction and arrangement of parts of which I shall now describe certain exemplary embodiments.

Reference is now made to the accompanying drawings wherein:

FIGURE 1 is a perspective view of a rug shampooing machine in accordance with the instant invention, with a portion cut away to show the mounting of one of the foam generating sponges;

FIGURE 2 is a vertical sectional view taken along the line 2—2 of FIGURE 1;

FIGURE 3 is a horizontal sectional view of the device taken along line 3—3 of FIGURE 2;

FIGURE 4 is a vertical cross sectional view illustrating a modified form of the invention.

Briefly, in the practice of my invention, I provide a pair of rotary brushes arranged in side-by-side relation, the brush holders mounting sponge-like collars having their peripheries in flexing contact. A separate container is provided which meters liquid detergent to the area of contact between the two sponge collars. As a driving motor turns the two brush-collar combinations in opposite directions, the flexing action of the contacting collars in the presence of the detergent generates an essentially dry foam which is deposited to the rug or carpet being cleaned, and subjected to the action of the rotary brushes.

Referring now to the drawings, a shaped housing **1** of either light metal or plastic with a bottom plate **2** is provided; and it is fastened to any suitable yoked handle **3**, as by means of pivot pins **4**. Inside the housing **1** is a small electric motor **5** secured to the top of the housing by flanges **6**. The drive shaft of the motor **5** mounts sheaves **7** and **8** which are used to drive the brush assemblies.

Journaled in bearings **9** in the bottom plate **2** of housing **1** are two circular brushes **10***a* and **10***b*. Mounted on the shafts **11***a* and **11***b* extending from their respective brushes are sheaves **12** and **13**. A drive belt **14**, preferably of the conventional V type connects sheaves **8** and **12**, while a similar belt **15** connects sheaves **7** and **13**. The belt **14** is given a half twist so that brush **10***b* turns in the same direction as the drive shaft of motor **5**, whereas brush **10***a* turns in the opposite direction.

As will be apparent, the brushes **10** and **10***a* rest directly on the surface to be cleaned. The weight of the device provides sufficient pressure for efficient scrubbing with no downward pressure from the operator. Furthermore, it is obviously advantageous to have no other parts contacting the cleaned surface which might leave tracking marks.

Sponge-like collars **16***a* and **16***b* surround and are fastened to the holders for brushes **10***a* and **10***b*, the collars make flexing contact at point **17**, as best seen in FIGURE 3. I have found that synthetic sponge material formed from polyurethane is highly satisfactory, but it will be understood that other forms of blown or molded cellular material may be employed. The peripheral contact of the two sponge collars creates a flexing action of the sponge material as the brushes and collars turn, which action serves to aerate the detergent and generate foam.

It will be noted that the bottom plate **2** is recessed into the housing **1** a short distance, leaving a downward extending peripheral flange **1***a* as seen in FIGURES 2 and 4. This flange acts to deposit the foam on the surface being cleaned directly in the path of the brushes, and keeps it from being spread about the room.

A container **18** is provided to hold a supply of liquid detergent; in FIGURE 2 it is shown mounted on the handle **3**. The container **18** is provided with a hinged lid **19**, or any other practicable means for filling said container. At **20** is any suitable metering device, which could be an

adjustable type valve, or merely a small orifice. A flexible tube or conduit **21** is provided to conduct the liquid from the metering means **20**, through an opening **22** in the housing **1**, and then to an opening **23** in the bottom plate **2** of the housing, directly above the point of contact between the sponge collars. Alternatively, the container **18** could comprise the can or jar in which the detergent is supplied, suitable mounting means being provided to secure it to the handle and effect a connection to the tube **21**.

In the operation of the machine, a metered quantity of high foaming liquid detergent is deposited at the point of contact of the sponge collars, and thereby aerated into an essentially dry foam. This foam will be continuously deposited on the rug or carpet being cleaned, and agitated by means of the revolving brushes. The detergent acts to pick up dirt in the rug. After thorough scrubbing, the foam is permitted to remain on the rug until it has dried, whereupon the collected dirt is removed by a subsequent vacuum cleaning operation. Rugs shampooed in this manner remain essentially dry and are not subject to the disadvantages attendant with the direct application of a liquid detergent solution to the rug. At the same time a material saving is effected in the amount of detergent required to clean a given rug. Tests have shown that the dry foam procedure requires approximately $\frac{1}{10}$ the amount of detergent required by the direct application method. A further advantage of this invention is that the device can be readily converted and used as a floor polisher, waxer, or even sander.

It will be understood that modifications may be made without departing from the spirit and purpose of the invention. For example, in FIGURE 4, I have illustrated a modification wherein the liquid detergent supply is maintained in a reservoir **24** built as an integral part of the housing itself. Access to this reservoir is by means of a hinged lid member **25**. This reservoir would be connected directly to opening **23** in the bottom plate of the housing. The size of the opening would perform the function of the metering means shown at **20** shown in other figures. Other modificaions could certainly be made, and consequently I do not intend to limit myself except as pointed out in the claims which follow.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A rug shampooing machine comprising a housing, a pair of rotary brushes mounted therein, means for generating foam integrally coupled with said brushes, said foam generating means comprising a cellular sponge-like collar surrounding and secured to each of said brushes, means for rotating said brushes and foam generating means, and means for supplying a foamable liquid to said foam generating means.

2. The device claimed in claim 1 wherein said sponge collars are formed from polyurethane.

3. A rug shampooing machine comprising a housing, a pair of rotary brushes extending downwardly therefrom and mounted on spaced apart parallel axes of rotation, cellular sponge-like collars surrounding and secured to said brushes, said collars being of a size to contact each other and be slightly compressed at their point of tangency, means for revolving said brushes and collars in opposite directions, and means for supplying a foamable liquid to said collars at their point of tangency.

4. A device according to claim 3 wherein said sponge-like collars are formed from polyurethane.

5. A device according to claim 3 wherein said housing is provided with an elongated handle, and wherein the said means for supplying a foamable liquid comprises a container attached to said handle, a means for metering the flow of detergent from said container, and a conduit for directing said metered flow to the point of tangency of said sponge collars.

6. The device claimed in claim 3 wherein said means for supplying a foamable liquid comprises a reservoir integral with said housing, said reservoir having a metering orifice directly over the point of tangency of the collars.

7. A device according to claim 3 wherein said housing incorporates a downwardly extending peripheral flange to direct the foam being generated onto the surface being acted upon.

References Cited in the file of this patent

UNITED STATES PATENTS

1,949,659	Ritter	Mar. 6, 1934
2,358,119	Wilson	Sept. 12, 1944