Feb. 28, 1961 R. W. LINENFELSER 2,972,764

RUG CLEANING DEVICE

Filed Feb. 25, 1958

FIG. 2

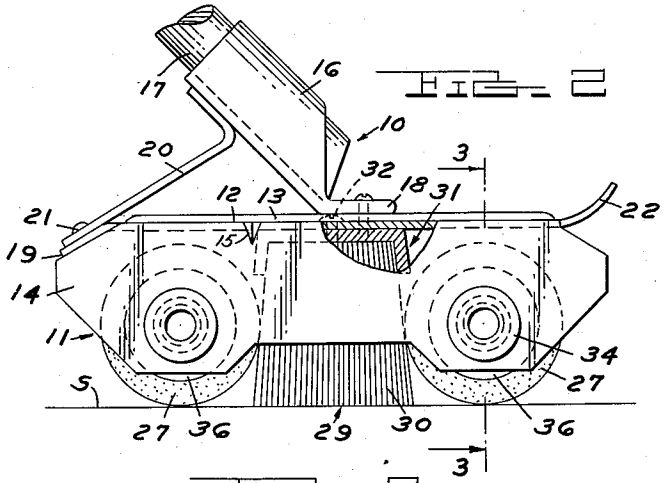


FIG. 3

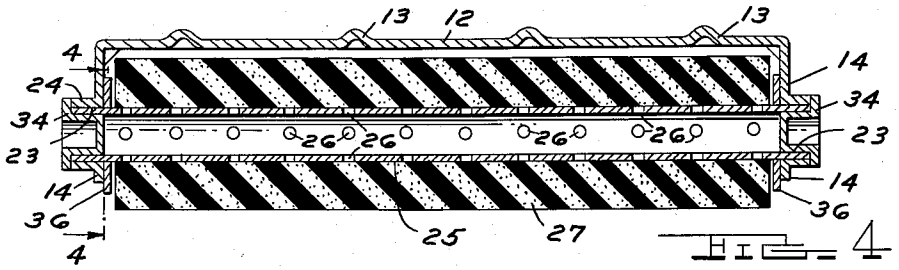


FIG. 4

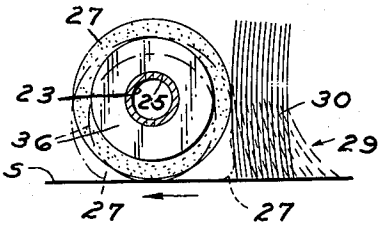
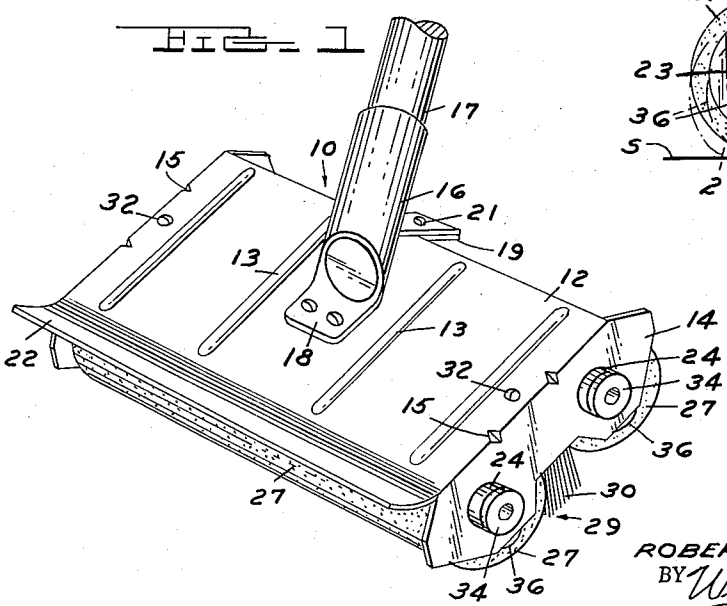


FIG. 1



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United States Patent Office 2,972,764 Patented Feb. 28, 1961

2,972,764

RUG CLEANING DEVICE

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Filed Feb. 25, 1958, Ser. No. 717,390

5 Claims. (Cl. 15—114)

The present invention relates to improvements in a device for cleaning rug and like surfaces, such device being of the general character illustrated and described in my copending application for United States Letters Patent Serial No. 688,728, filed October 7, 1957, of which this application is a continuation-in-part.

It is an object of the invention to provide a cleaning device of this type featuring spaced rollers of a sponge-like, liquid pervious material and a coacting brush unit disposed therebetween, in which the rollers and scrubbing brush unit are mounted by a housing of improved sheet metal construction having plural functions in the operation of the device.

Another object is to provide a sheet metal housing structure for the combined brush and roller type cleaning device as described, in which the housing structure has provisions for journaling the rollers and mounting the brush unit, as well as to afford an auxiliary scraper or doctor element improving the effectiveness of the device in use. This housing structure is unitary and one piece in nature and is formed by simple and inexpensive metal stamping or like shaping operations.

A still further object is to provide a rug cleaner of the sort disclosed in my above identified application, including liquid pervious rollers of sponge rubber coacting with a central brush unit to produce a copious foam of liquid cleaning agent or detergent, in which provision is made to prevent undue compression and flattening of the rollers. This would detract from their intended function in combination with the brush unit.

Yet another object is to provide a cleaning device in accordance with the preceding paragraph in which the compression limiting means takes the form of washer-like rings loosely surrounding a pair of axial detergent containing tubes to supply the compressible rollers with cleaning agent. These rings limit downward floor compression of the rollers without imposing excessive frictional resistance to the floor operation of the device.

The foregoing as well as other objects will become more apparent as this description proceeds, especially when considered in connection with the accompanying drawings illustrating a preferred embodiment of the invention, wherein:

Fig. 1 is a fragmentary perspective view of the improved device in accordance with the invention;

Fig. 2 is a side elevational view, partially broken away and in section;

Fig. 3 is a view in vertical section along line 3—3 of Fig. 2; and

Fig. 4 is an end elevational view, as from the line 4—4 of Fig. 3, somewhat schematically showing one of the compressible cleaning rollers and associated brush unit, the normal uncompressed and unstressed position of these components being indicated in solid line, and their compressed condition in dotted line, respectively.

The reference numeral 10 generally designates the improvement, depicted as embodied in a roller and scrubbing brush type device for cleaning surfaces such

as rugs. Device 10 comprises a one piece stamped sheet metal roller and brush housing 11 formed by conventional slitting and stamping provisions to provide a horizontal top or cover plate 12 of rectangular outline, preferably ribbed longitudinally at 13 for stiffness and rigidity, and a pair of 90° downwardly offset side confining flanges or walls 14 at either end of the plate 12. The housing 11 may, if desired, be provided with spaced inward indentations or embossments 15 in the bends connecting plate 12 and flanges 14, for a purpose to be described, as well as to stiffen the housing in this bend zone.

A tubular handle holder or fitting 16 for the reception of a handle 17 is fixedly secured to the center of top plate 12, as by forming an angular offset 18 in the fitting and riveting or screwing the offset to the plate. Handle fitting 16 is braced by an angled rear bracket 20; and a rear marginal portion 19 of the top plate 12 is angularly offset downwardly in parallelism with adjacent corresponding surfaces of the end flanges 14, at which it is fixedly connected to the latter. Portion 19 supports and anchors the bracket 20, as through the agency of rivets 21 or other type fastener.

The opposite margin of the top plate 12 is formed to provide a scraper or doctor element 22 of upwardly and outwardly curved contour. In forming the housing structure, this marginal portion will be separated from the flange portions of the housing by slotting or slitting, then appropriately stamped in the outline shown in Fig. 2.

The end walls or flanges 14 of the housing 11 are provided with laterally aligned pairs of journal openings 23 which receive the parallel dispensing tubes 25 for free rotation; and collars 24 surround and are secured to these tubes outwardly of flanges 14 to restrain their end movement. In accordance with the principles of my prior application, the tubes 25 carry a plurality of longitudinally and circumferentially distributed perforations or orifices 26, and each of the tubes has fixedly sleeved thereover a roller 27 of sponge rubber, synthetic sponge rubber or other liquid pervious material.

The brush unit of the improved cleaner is generally designated 29. It comprises a mass of flexible bristles 30 of approximately the same length extending parallel to and between the axes of rollers 27. These bristles are mounted in a holder element 31 of downwardly facing channel section which extends the full distance between opposite end walls or flanges 14 of the housing. The bristles 30 and holder 31 are pre-assembled, and are then secured to the lower surface of top plate 12 by means of screws, rivets or equivalent fasteners 32. The indentations 15 referred to above facilitate this locating and assembling procedure.

The interior of the liquid containing tubes 25 is closed at opposite ends by hollow plastic plugs 34, at least one plug of each tube being removable for refilling.

It has been found that the soft and readily deformable character of the sponge rubber rollers 27 is apt, in the event excessive downward force is exerted, to impair the action of the rollers 27 and brush unit 29 in generating copious lather in the detergent issuing from the rollers to the brush, as contemplated in the use of the device; and that there is a predetermined degree of compression for optimum foam generation which should not be exceeded.

Therefore, in order to limit compression and deformation of the sponge rubber rollers by an unpracticed user, the present invention contemplates the use of a pair of loose bearing rings 36 at each end of each roller 27, immediately within the flanges 14. These rings loosely encircle the respective tubes 25 and are relatively loose in the axial sense between the roller 27 and the adjacent

flanges **14**, thus insuring against excessive frictional resistance to turning of the rollers.

The compressed and uncompressed conditions of the rollers and brush unit are indicated, respectively, in solid and dotted line in Fig. 4. In the former condition, as also depicted in Fig. 2, the uncompressed rollers and the bottom surface of brush unit **29** are substantially flush with a floor or rug surface S, whereas, as shown in dotted line in Fig. 4 (on the assumption that the device is moving to the left under a maximum compressive force), the bearing rings **36** act as positive stops preventing excessive force of engagement between the distorted sponge rubber of the roller **27** and the adjacent bristles **30**.

The use of the device involves its reciprocatory movement under desired pressure over a rug or like surface, preferably at a right angle to the axes of rollers **27**, in which manipulation copious foam is worked up and applied by the rollers and brush unit **29** to the surface. When an area has been adequately cleaned, the device is inverted and the scraper **22** is drawn over the rug surface to take up the suds in a uniform way. This at the same time restores the rug nap uniformly and completes the cleaning job.

Referring to Figs. 2 and 4, it will be seen that the peripheries of the rollers normally engage the bristles of the brush, and the rollers are journaled on the head in position to engage and roll upon the surface being cleaned during movement of the head over the latter surface with the brush bristles in contact therewith. As the device is moved back and forth, the bristles of the brush flex toward and against the peripheral surface of one roller or the other. Hence as the roller rotates in contact with the brush, its peripheral surface is squeezed and has a frictional engagement with the brush. The squeezing and continuous rubbing engagement between the brush and roller due to the rotation of the latter produces a foaming action on the cleaning fluid used with the device. The rings **36** limit the compression of the sponge rollers and absorb the excess pressure.

The device is very simple and inexpensively manufactured for low cost distribution, due to the minimum number of parts and their exceedingly simple assembly. It possesses all of the effectiveness of the device shown and described in my copending application, and, indeed, it is substantially improved in this respect by the compression control action contributed by the roller bearing rings.

The drawing and the foregoing specification constitute a description of the improved rug cleaning device in such full, clear, concise and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claims.

What I claim as my invention is:

1. A device for cleaning the surfaces of rugs and the like comprising a movable head, a scrubbing brush fixedly carried by said head, a roller having a liquid pervious peripheral surface of a resilient deformable material, said roller being journaled on said head in position to engage and roll upon the surface to be cleaned during movement of said head over the latter surface with said scrubbing brush in contact with the latter surface, said roller further being positioned adjacent said scrubbing brush and the bristles of said brush being flexible for flexure toward and against the peripheral surface of said roller during movement aforesaid of said head and rotation of said roller to squeeze from the peripheral surface of said roller and produce a foaming action on cleaning fluid used in conjunction with said device.

2. A device as in claim 1 having roller limit means for preventing excessive compression of the peripheral surface of said roller in use.

3. A device as in claim 1, said roller limit means including rings engageable with the surface to be cleaned and loosely journaled on said roller at opposite ends thereof for free rotation, said rings being of smaller diameter than said roller in the normal uncompressed condition of the peripheral surface of said roller.

4. A device for cleaning the surfaces of rugs and the like comprising a movable head and a handle attached to said head, an elongated scrubbing brush fixedly carried by and extending across the bottom of said head, rollers of liquid pervious resilient deformable sponge material journaled on said head and extending across the bottom of said head at opposite sides of said brush with their axes of rotation generally parallel to the direction of length of said brush, said rollers being of a diameter to engage and roll upon the surface to be cleaned during movement of said head over said surface with said brush in contact with said surface in directions transversely of the length of said brush, said rollers further being positioned adjacent said scrubbing brush and the bristles of said brush being flexible for flexure toward and against the peripheral surface of one roller or the other during movement aforesaid of said head and rotation of said rollers to squeeze from said rollers and produce a foaming action on cleaning fluid used in conjunction with said device.

5. A device as in claim 4 having roller limit means for preventing excessive compression of the peripheral surfaces of said rollers, said roller limit means including rings engageable with the surface to be cleaned loosely journaled on said rollers at opposite ends thereof for free rotation, said rings having circular peripheries and being of smaller diameter than said rollers in the normal uncompressed condition of said rollers.

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UNITED STATES PATENT OFFICE

CERTIFICATION OF CORRECTION

Patent No. 2,972,764 February 28, 1961

Robert W. Linenfelser

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 15, for the claim reference numeral "1" read -- 2 --.

Signed and sealed this 1st day of August 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents