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SHAMPOOER WITH CONFIGURED COMPRESSIBLE FORM APPLICATING ROLLER

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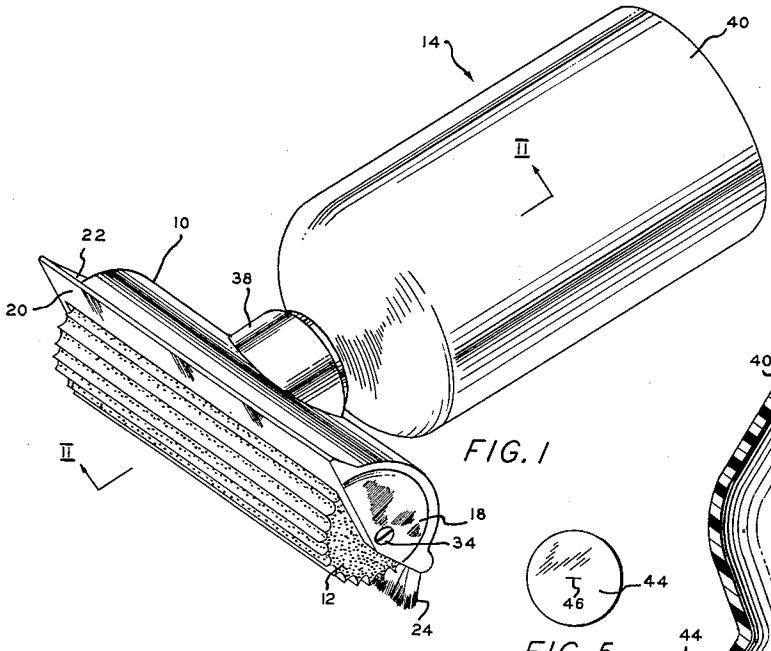


FIG. 1

FIG. 5

FIG. 2

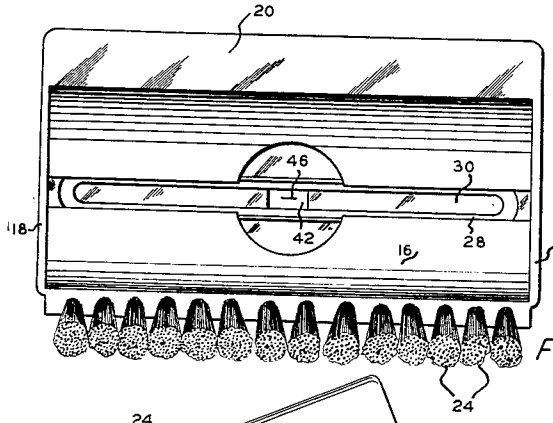


FIG. 3

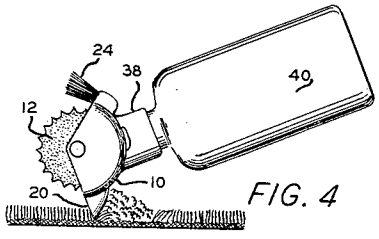


FIG. 4

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SHAMPOOER WITH CONFIGURED COMPRESSIBLE FOAM APPLICATING ROLLER

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The invention pertains to a liquid applicator and particularly relates to a liquid applicator incorporating brushing and scraping means wherein the device may be employed to clean rugs, fabrics and similar articles by the combination of a soaping and scrubbing operation.

The invention is directed to a cleaning device which may be held in the operator's hand and is particularly adaptable for cleaning small surfaces such as automobile upholstery and localized areas of rugs and carpets. It is well known in the cleaning arts that a combination of soap, or other cleaning compounds, and a brushing action provided good cleaning results and the invention is directed to a simple device employing these principles which may be very easily operated without the operator becoming soiled or wetting his hands.

Liquid detergents of superior cleaning characteristics are now available upon the market and many of these detergents provide the best cleaning action when in the form of foam or suds and it is an object of the invention to provide a small, hand-held cleaning device or shampooer employing liquid detergents wherein foam or suds may be readily produced.

Yet another object of the invention is to provide a cleaning device employing a liquid detergent which is capable of cleaning rugs or a fabric without unduly wetting the same.

A further object of the invention is to provide a liquid applicator wherein a cellular compressible roller is employed to create a foam from a liquid detergent and brush means are employed to work the foam into the article being cleaned. The foaming and brushing being simultaneously accomplished upon the invention being moved back and forth across the article being treated.

Another object of the invention is to provide a cleaning device using a liquid detergent wherein positive means are provided for feeding the detergent to a roller which creates a foam and means are utilized to evenly distribute the detergent over the roller.

Yet another object of the invention is to provide a liquid applicator which may be employed for purposes other than cleaning, for instance, applying paint in the manner similar to that of conventional paint rollers.

These and other objects of the invention arising from the relationship and details of an embodiment thereof will be apparent from the following description and accompanying drawing wherein:

FIG. 1 is a perspective view of an applicator in accord with the invention,

FIG. 2 is an elevational sectional view of the invention, taken along section II—II of FIG. 1,

FIG. 3 is a bottom view of the body member, with the roller, shaft and distributor strip therefor removed, as taken along III—III of FIG. 2,

FIG. 4 is an elevational view of the applicator of the invention as inverted wherein the scraper is removing the foam from the article being cleaned and

FIG. 5 is a detail view of the valve element employed with the invention.

The general appearance of the device of the invention will be best appreciated from FIGS. 1 and 4 wherein the invention basically consists of a body member **10** having a roller **12** journaled therein and a reservoir generally indicated at **14** is affixed to the body member and serves the dual purpose of containing the cleaning liquid and also, functions as a handle to be gripped by the operator.

The body member **10** is preferably composed of a molded synthetic material of relatively rigid and tough physical characteristics. The body member is provided with a concave cylindrical recess **16** which extends substantially the entire width thereof and the recess is defined at its ends by the laterally extending end portions **18**. It will be apparent from FIGS. 1 and 2 that the body member encompasses less than 180° of the roller **12** and a scraping or blade portion **20** is formed on the body member extending radially from the axis of the cylindrical recess **16**. The scraper blade **20** is preferably integrally formed upon the body member and is enforced at the ends by the web portions **22**. A plurality of brush bristles **24** are molded into the body member portion **26** and extend therefrom as to define a brushing edge extending the width of the body member. The brush bristles **24** are shown as formed in a plurality of groups, FIG. 3, however, the bristles may be arranged in other patterns into the body member.

A plurality of substantially rectangular recesses **28** and **30** are defined in the cylindrical recess **16** of the body member and substantially extend the entire width thereof, FIG. 3. The recess **30** is of lesser width than the recess **28** and is formed concentric to the larger recess whereby the longitudinal sides of the recesses will be parallel. An elongated strip of plastic **32** is fitted within the larger recess **28** and is so dimensioned as to be somewhat loosely associated therewith along its longitudinal edges or portions of the edges as to permit fluid to flow around portions of the strip **32** throughout its length. Upon the strip **32** being within the recess **28**, FIG. 2, it willl be appreciated that the recess **30** defines a passageway extending the width of the entire body member and fluid within the passage may leak or pass around the strip **32** throughout its length as to be distributed throughout the width of the body recess **16**.

The sudsing, foaming and application of the cleaning liquid upon the article to be cleaned is accomplished through the roller **12** which is rotatably and concentrically located within the recess **16**. A roller **12** may be mounted upon a shaft **34** which is rotatably journaled within holes defined in the body end portions **18**. The shaft **34** may be constructed of a pair of semicylindrical portions of the same material as the body member, if desired. The roller member **12** is preferably formed of a compressible cellular tough material, such as foamed polyurethane and is of a generally cylindrical configuration having a width substantially equal to that of the body member recess **16**. The outer surface of the roller **12** is formed with a plurality of longitudinally extending concave recesses **36** which intersect each other as to define a plurality of ridges or ribs as illustrated in FIGS. 1 and 2. It will be appreciated that the ridges are of relatively sharp defined configuration and upon rolling the roller over the surface to be treated, the ridges will compress and the liquid detergent upon the roller will be worked by the squeezing and expanding of the cells of the roller to produce a foam which will deposit upon the article being treated. When the device is being used, it will be held in the position of FIG. 2 such that the liquid detergent within the recess **30** will flow around the strip **32** and will be wiped from the housing portions adjacent the slot **28** by the roller ridges and thereby deposited upon the roller.

The body member **10** is provided with a central boss element **38** having a threaded bore therein and a flexible walled container or bottle **40**, such as is commonly termed a squeeze bottle and are usually constructed of styrene

or similar synthetic material having a threaded neck which may be threaded into the bore of the boss **38**. The body member **10** is provided with a central opening **42**, FIG. 3, which communicates with the recess **30** and the threaded bore of the boss portion **38**. A valve element **44**, FIG. 5, is located within the threaded bore of the boss and is of a circular configuration having a small central slot **46** extending therethrough. The valve element **44** is formed of rubber or similar material and is maintained in position by the end of the neck of the bottle **40** which compresses and holds the valve by its peripheral portions against the body member **10**. The purpose of the valve element **44** is to require a definite collapsing of the reservoir to force the liquid detergent therein into the recess **30**. The valve slot **46** will normally close itself and prevent the fluid from flowing from the reservoir unless the pressure in the reservoir is sufficient to force the detergent through the restricted slot opening as when the operator squeezes the bottle to distribute additional detergent upon the roller.

In operation, the bottle **40** is filled with a detergent and water solution and is threaded into the bore of the boss **38** as shown in the assembled relation of FIG. 2. The operator will then squeeze the bottle **40** a couple of times to force the liquid detergent into the recess **30** which will thereupon drip down upon the roller **12**. The roller and brush are then positioned upon the article to be cleaned, as shown in FIG. 2 and moved back and forth thereacross rapidly wherein the rolling action of the roller will cause a suds to occur due to the compression and decompression of the cells within the roller and the action of the ridges and grooves **36**, as explained above. While the roller is being rotated back and forth upon the surface to be treated the bristles **24** are maintained in engagement with the surface being treated as to work the suds into the rug or similar article and agitate the soap therein to provide a thorough cleaning action. An occasional squeeze of bottle **40** will provide detergent as needed.

After the desired scrubbing by the bristles and application of detergent is accomplished, the operator rotates the device 180° to the position shown in FIG. 4 and by drawing the scraper blade **20** over that portion previously brushed and sudsed, the scraper will collect and pick up the suds which remain. A cloth may then be used to remove the suds from the scraper blade. In that the above described action may be very quickly done and the suds are relatively slow to wet the fabric of a rug or carpet, quickly removing the suds from the article cleaned will prevent excessive wetting thereof.

In addition to being used as a cleaning device, it is contemplated that the invention may be used to apply paint upon flat surfaces in a manner of conventional paint rollers. When used in such application, there is no need for the scraper blade and brush bristles, of course, and an embodiment of the invention for this purpose would not have these components formed thereon. The paint would then be placed within the liquid reservoir and applied to the roller as needed.

It is appreciated that various modifications to the invention may be apparent to those skilled in the art without departing from the spirit and scope thereof and it is intended that the invention be defined only by the following claims.

I claim:

1. A substantially cylindrical homogeneous liquid application roller for producing a cleansing foam formed of a compressible cellular foam polyurethane material having an outer peripheral surface, a plurality of parallel, longitudinally extending compressible ridges integrally defined on said outer surface, said ridges being defined by a plurality of parallel longitudinally extending intersecting concave grooves, adjacent grooves intersecting at a sharply defined line constituting the peripheral terminating edge of said ridges.

2. A liquid applicator and cleaner comprising, in combination, a body member, a substantially cylindrical compressible cellular foam roller rotatably mounted on said body member, integral longitudinally extending ridge elements defined on said roller, a plurality of brush bristles mounted on said body member defining a brushing edge, said bristles being disposed upon said body member whereby said roller and said brushing edge simultaneously engage the surface to be treated, a flexible wall liquid reservoir attached to said body member, an elongated, open-sided recess defined in said body member adjacent and opening toward said roller and extending parallel to the axis thereof, loosely fitting cover means associated with said recess, said recess and cover means defining a liquid distributor for said roller, a passage defined in said body member interconnecting said reservoir and said recess, a resilient valve disc interposed in said passage, and a self-closing opening defined in said valve disc adapted to permit liquid to flow therethrough upon a predetermined pressure being produced in said reservoir.

3. A liquid applicator and cleaner comprising in combination, a body member of generally semicylindrical configuration defining a generally semicylindrical recess, first and second axially extending edges defined on said body member constituting the peripheral termination of said body member, a projection defined on said body member on the opposite side thereof with respect to said recess, a groove defined in said body member axially extending substantially the length thereof and adjacent said recess throughout its length, a loosely fitting cover strip enclosing said groove whereby a limited clearance is defined between said strip and said recess that liquid may slowly flow past said strip into said recess, a bore defined in said projection, a flexibly walled reservoir affixed to said projection in communication with said bore, a passage defined in said body member interconnecting said bore and groove, a resilient valve disc interposed between said bore and passage, a self-closing opening defined in said valve disc, a cylindrical cellular roller rotatably mounted on said body within said recess formed of a foamed compressible material, a plurality of easily compressible longitudinally extending ridges defined on the periphery of said roller of the material thereof, bristles mounted on said body member adjacent said first edge disposed adjacent said roller and a scraper blade defined on said body member adjacent said second edge extending away from said roller.

4. In a liquid applicator and cleaner as in claim 3 wherein said roller ridges are defined by a plurality of parallel longitudinally extending intersecting concave grooves, adjacent grooves intersecting at a sharply defined line constituting the termination of said ridges.

References Cited in the file of this patent

UNITED STATES PATENTS

1,236,126	Wightman	Aug. 17, 1917
2,029,056	Carlson	Jan. 28, 1936
2,229,707	Testi	Jan. 28, 1941
2,528,657	Hobe	Nov. 7, 1950
2,810,924	Slingluff	Oct. 29, 1957
2,892,202	Williams	June 30, 1959
2,932,045	Rabelow	Apr. 12, 1960
2,951,256	Hulsh	Sept. 6, 1960
2,972,764	Linenfelser	Feb. 28, 1961
2,975,462	Yonkers et al.	Mar. 21, 1961

FOREIGN PATENTS

775,900	Great Britain	May 29, 1957