Dec. 8, 1959 H. E. ETHRIDGE 2,915,889

RUG CLEANING DEVICE

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Fig. 1.

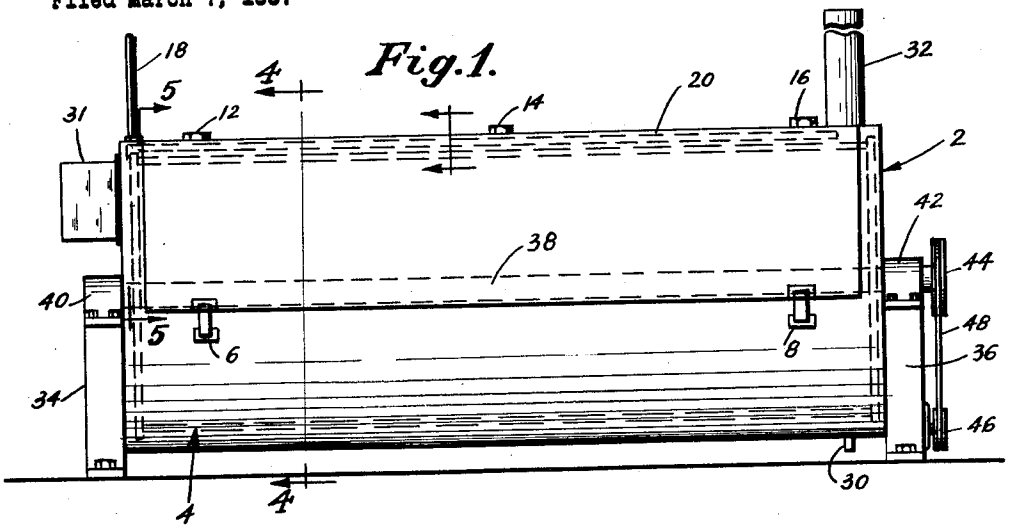


Fig. 2.

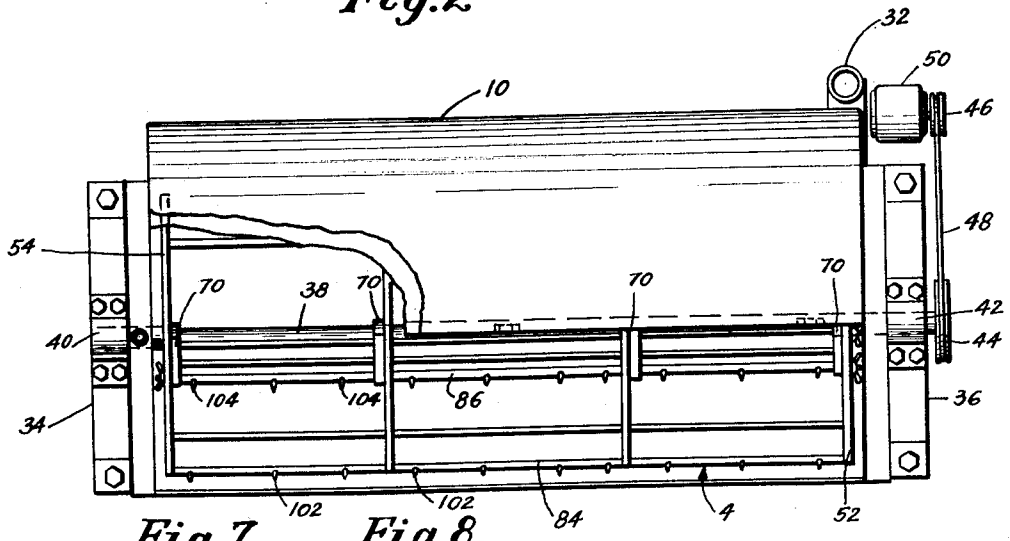


Fig. 7.

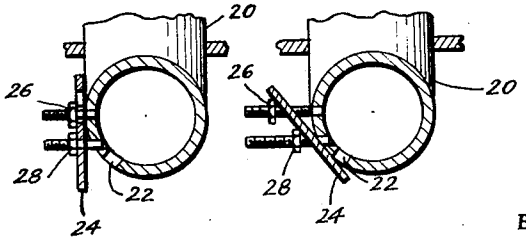


Fig. 8.

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Fig. 3.

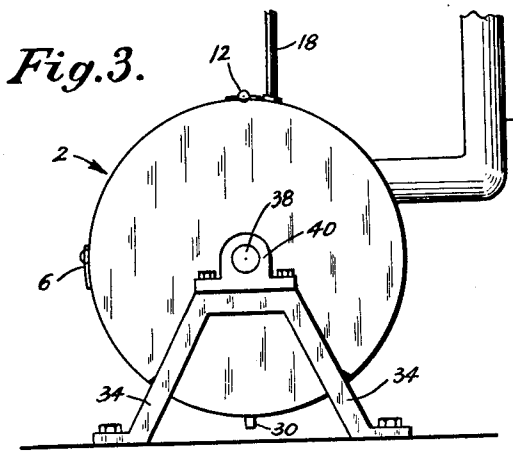


Fig. 4.

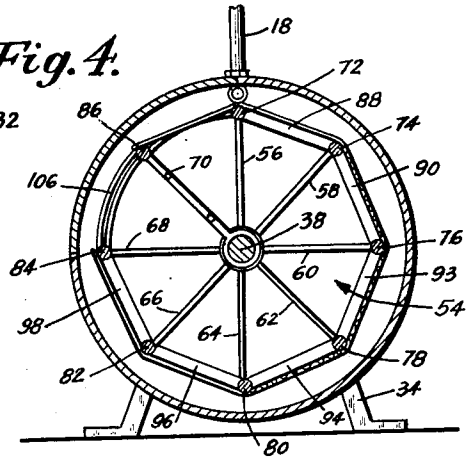


Fig. 6.

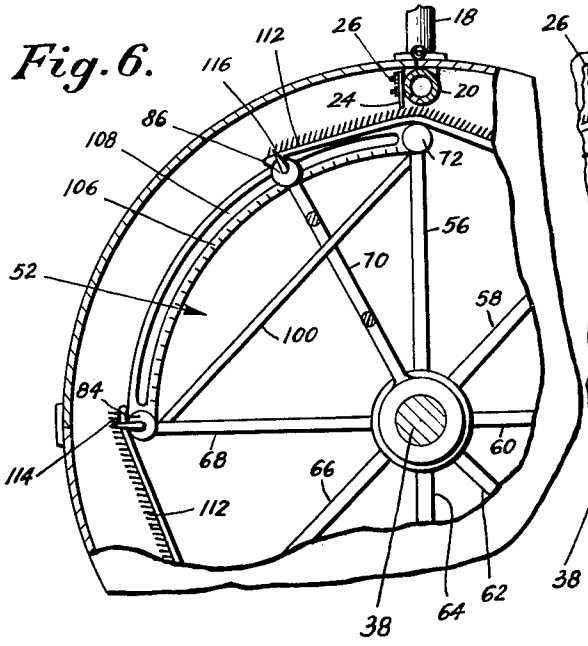
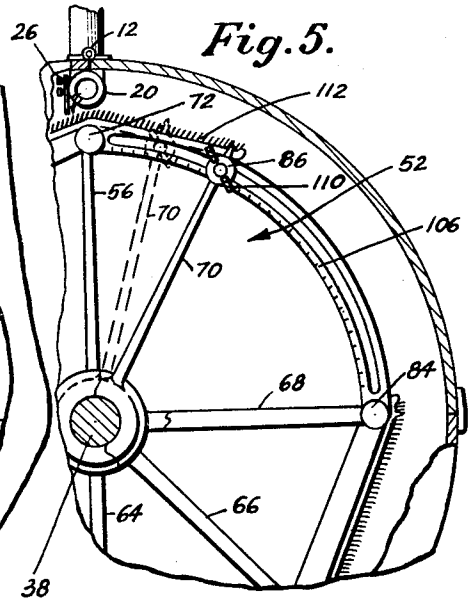


Fig. 5.



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RUG CLEANING DEVICE

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2 Claims. (Cl. 68—62)

This invention relates to an apparatus for cleaning rugs, blankets, curtains, drapes and the like.

In the cleaning of many types of articles, such as rugs for example, it is imperative that there be no shrinkage of the material either during the cleaning or drying. With bulky fabrics, such as rugs for example, it is also imperative that the cleaning solvent thoroughly penetrate the fabric.

Accordingly, it is an object of the present invention to devise an apparatus which will prevent fabrics from shrinking in the cleaning and/or drying process.

A more specific object is to provide an apparatus which will enable rugs and the like to retain their shapes during the cleaning operation.

Another object is to provide a more efficient rug cleaning.

Still further objects and the entire scope of applicability of the present invention will become apparent from the detailed description given hereinafter; it should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention as defined in the claims will become apparent to those skilled in the art from this detailed description.

In the drawings, which are illustrative, and in no sense restrictive:

Figure 1 is a front elevation of the apparatus;

Figure 2 is a top plan view of the apparatus with the lid open;

Figure 3 is an end view of the apparatus;

Figure 4 is a sectional view along the line 4—4 of Figure 1;

Figure 5 is a sectional view along the line 5—5 of Figure 1;

Figure 6 is a view similar to Figure 5 but looking in the opposite direction to show the measuring scale;

Figure 7 is a sectional view of one form of fluid pipe illustrating the means for regulating the flow of liquid in an open position; and

Figure 8 is a view similar to Figure 7 but showing the regulating means in a partially closed condition.

In Figure 1 there is shown the sealed tank 2 having mounted for rotation therein octagon-shaped rug reel 4 which is about 5 feet in diameter and 12 feet long. The tank can be closed by locking latches 6 and 8. The top 10 of the tank can be pivoted upwardly in order to open the tank with the aid of hinges 12, 14 and 16. Cleaning solvent is introduced into the tank 2 through inlet 18 and pipe 20.

Pipe 20 extends horizontally of the tank for substantially the entire length thereof. A portion of feed pipe 20 is cut away for the full length in order for solvent to pass onto the rug or other article to be cleaned. In this manner, the solvent can be applied under pressure which can be adjusted by regulating the size of the opening 22 in the pipe. One means for regulating the opening is

shown in Figures 7 and 8 wherein there is provided a metal adjustment plate 24 which extends the full length of the feed pipe 22. There are also provided screws 26 and 28 to secure the metal adjustment plate to the solvent feed pipe. The pressure can be increased or decreased by adjusting the screws to increase or decrease the size of the opening. In this way it is also possible to influence the direction of flow of solvent onto the rug.

Dirty solvent is drained from the tank 2 through outlet 30. If it is desired to use the apparatus for drying as well as cleaning, then after the cleaning and extracting cycles, air is heated in oven 31 and forced into the apparatus in order to dry the article on the reel. Solvent fumes (and hot air in the drying cycle) are removed through exhaust pipe 32.

The tank 2 is supported on pedestals 34 and 36. Rug reel 4 is supported on shaft 38 which extends through the tank 2 and is mounted for rotation on bearings 40 and 42. Shaft 38 is connected via pulleys 44 and 46 and belt 48 to motor 50.

Connected to shaft 38 are spiders 52 and 54 which form the opposed ends of reel 4. For increased structural strength two additional spider members can be provided between the end spiders to divide the reel 4 into three equal compartments. The arms 56, 58, 60, 62, 64, 66, 68 and 70 of the spider are of identical length and with the exception of rug pin arm 70 are fixed so as to provide a central angle between two adjacent arms (other than between arm 70 and arms 68 and 56 of 45°). Secured to the ends of the arms of the spider and perpendicular thereto are provided longitudinal pipes 72, 74, 76, 78, 80, 82, 84 and 86 which extend the length of the rug reel from spider 52 to spider 54. At the outer extremity of the spiders there are provided metal braces 88, 90, 93, 94, 96 and 98 between the adjacent longitudinal arms and there is also provided a brace 100 between pipes 72 and 84. Pipe 84 has metal pins 102 for securing one end of a rug or other bulky fabric along the entire length thereof. In a similar manner, pipe 86 has metal pins 104 for securing the opposite end of the rug.

Between the ends of arms 56 and 68 there is provided an arcuate measuring bar 106. The measuring bar is provided with a suitable scale, e.g., in feet and inches as shown in Figure 6. In order to permit rug pin arm 70 and attached longitudinal pipe 86 to move freely, measuring bar 106 can be cut away as at 108. Rug pin arm 70 can then be fixed in any desired position by tightening wing nut 110. Figure 5 illustrates possible alternative positions for rug pin arm 70.

When it is desired to clean a rug 112 (or other fabric), one end 114 of the rug is secured to longitudinal pipe 84 by means of pins 102. The reel 4 is then rotated by hand or mechanically to roll the rug onto the reel. The opposed end 116 of the rug is then secured to longitudinal pipe 86 by means of pins 104 and rug pin arm 70 is rotated about shaft 38 until the rug is taut and then is locked into position with the aid of wing nut 110 in the manner previously set forth. In this way, the rug is measured to exact size and is maintained throughout the cleaning and, if desired, subsequent drying so that it cannot shrink. It will be observed that the rug mounting means comprises continuously disposed angular areas including six sides of a regular octagon and a pair of sides of inversely variable width, which variable width is determined by the position of movable arm 70.

After the rug, or other fabric, is secured to the reel, the tank is closed and solvent, e.g., Stoddard solvent 140° F. (or any other solvent conventionally employed in the processing of wearing apparel, etc. in dry cleaning plants) is sprayed onto the rug through solvent pipe 20. Normally, sufficient solvent is added to half fill the tank 2. The reel is then set in rotation at a relatively slow rate,

e.g., 20 r.p.m. Cleaning results from the flat surface of the octagonally-shaped reel striking against and passing through the solven on one side, and then as it turns and rises on the other side, a reverse action takes place resulting in forcing the cleaning solvent back and forth through the rug material. Continuously through the cleaning process clean solvent enters at the top through solvent pipe **20** and dirty solvent drains off at the bottom through exit pipe **30**. The dirty solvent then passes through filters or is otherwise purified and returned for repeated use. Preferably, after the reel has rotated several turns in one direction, e.g., 3 turns, its direction of rotation is reversed and this procedure is continued throughout the cleaning step. At the end of the cleaning step, the solvent inflow is stopped and the solvent is drained off through exit pipe **30**. Then the speed of the octagonally-shaped reel is greatly increased, e.g., to 125 r.p.m., in order to extract the solvent and any remaining dirt by centrifugal force. Finally, the last traces of solvent are removed from the rug in a drying step wherein the speed of rotation is preferably again reduced, e.g., to 20 r.p.m. In the drying step hot air is forced through the rug to aid in removal of the solvent as vapor through exhaust pipe **32**. It will be observed that the rug is held to its original measurements throughout the cleaning, extracting and drying steps.

In addition to the advantages previously set forth, it will be observed that by extracting the rug while it is still secured to the rug reel that the rug is never creased or wrinkled and the nap is forced into an upright position as it was when new.

As will be appreciated by those skil'ed in the art, while for most efficient operation the drying step is carried out using the rug reel, it is also possible to dry the rug on conventional racks in the case of small plants which are not equipped to economically carry out the drying while the rug is on the reel.

The only hand labor required in the instant process is in the loading and un'oading of the machine, and even these steps can be made virtually automatic.

I claim:

1. An apparatus for cleaning a bulky fabric, said apparatus comprising a tank, fabric supporting reel means rotatably mounted within said tank, said fabric supporting reel means having eight arcuately spaced circumferentially disposed members to form an octagonal reel for supporting the fabric in tubular form, means mounting one of said members for circumferential movement into different positions with respect to all of the other members, said one member and at least one other of said members carrying means for securing the fabric whereby the fabric is held taut against said members and about said fabric supporting reel means, six sides of said octagontal reel being of at least substantially equal width, and the other two sides of said octagonal reel being of inversely variable widths with respect to one another as determined by the position of said one member.

2. An apparatus for cleaning a bulky fabric as defined in claim 1 and further including a solvent dispensing means having an adjustable out'et means, for dispensing solvent over substantially the entire width of said fabric.

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