April 4, 1961 H. A. SCHRABER 2,977,784

DRY CLEANING APPARATUS

Filed May 21, 1956

FIG. 2

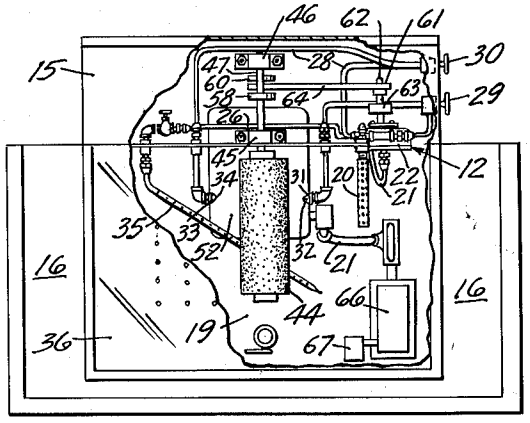


FIG. 1

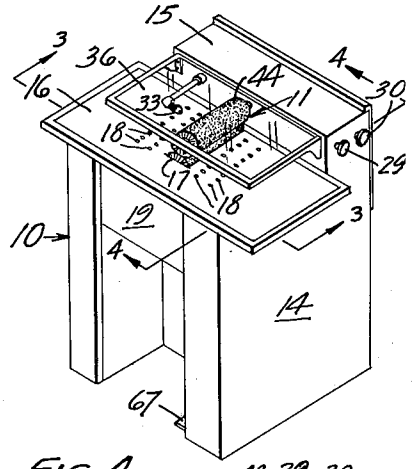


FIG. 3

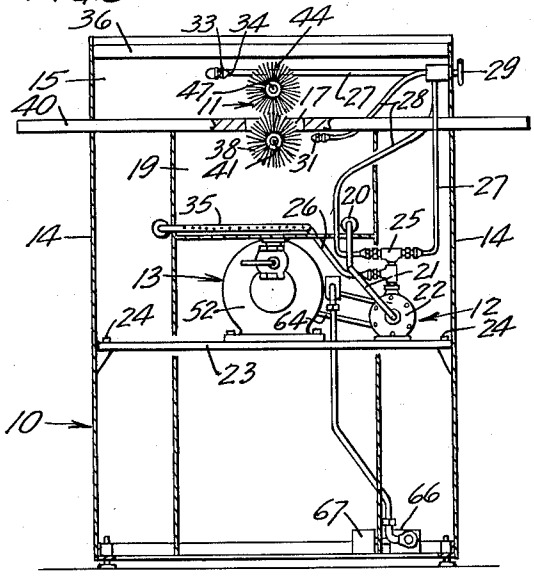


FIG. 4

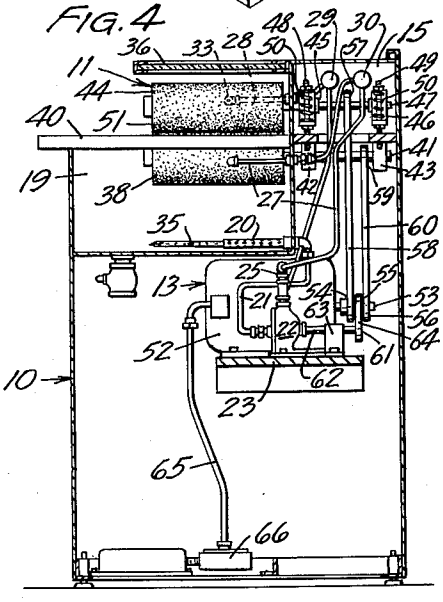


FIG. 5

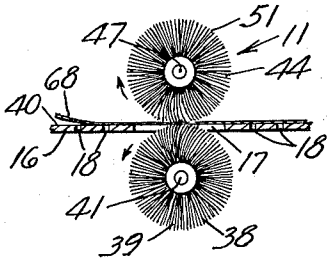
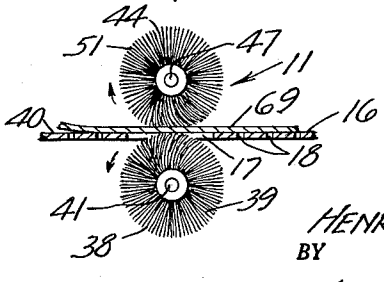


FIG. 6



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DRY CLEANING APPARATUS

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2 Claims. (Cl. 68—38)

This invention relates to dry cleaning apparatus, and has special reference to a mechanism for brushing and applying dry cleaning fluid to soiled garments before they are run through regular dry cleaning operations.

This application is a continuation-in-part of my application Serial No. 416,893, filed March 17, 1954, for "Dry Cleaning Device," now abandoned in favor of this application.

In the art of dry cleaning, it often occurs that clothing will have areas in extremely soiled condition so that ordinary dry cleaning will not remove all of the dirt and grime. For this reason, it has become necessary for dry cleaning establishments to engage in what is known as "pre-spotting" or pre-cleaning so as to condition the over-soiled portions of garments before they are subjected to the usual cleaning operations. Such pre-cleaning ordinarily has been done by hand and requires the employment of labor of a skilled nature which, in turn, is expensive, particularly because of the technique involved in obtaining thorough cleaning without weakening or destroying the cloth.

It is, therefore, an important object of my invention to provide a simple and efficient mechanical brushing means coupled with application of spotting or pre-cleaning fluid to condition over-soiled portions of garments before they are subjected to ordinary cleaning operations.

Another object of the invention is to provide dry cleaning apparatus which will give a gentle, but thorough, preconditioning to over-soiled areas of clothes, even where the clothing is constructed of artificial fibers of a delicate and easily ruptured nature.

A further object of the invention is to provide apparatus of the class described wherein brush elements and spray elements are related in such a manner as to properly and automatically apply pre-spotting fluid either directly to the cloth to be cleaned or upon the cleaning brushes.

A still further object of the invention is to provide dry cleaning apparatus having a pair of cooperating brushes which will give a gentle but thorough cleaning action to both surfaces of cloth to be cleaned without distorting or pulling the cloth and irrespective of the thickness of the cloth.

These and other objects and advantages of my invention will more fully appear from the following description, made in connection with the accompanying drawings, wherein like reference characters refer to the same parts throughout the several views and in which:

Figure 1 is a perspective view of my dry cleaning apparatus;

Figure 2 is an enlarged top view thereof with the table top and cover removed;

Figure 3 is an enlarged vertical section of my apparatus on the line 3—3 of Figure 1;

Figure 4 is another enlarged vertical section taken on the line 4—4 of Figure 1;

Figure 5 is a diagrammatic representation of the relative positions of the roller brushes and their bristles with respect to a thin and delicate piece of cloth; and

Figure 6 is a diagrammatic representation similar to Figure 5 but showing the relative positions of the roller elements and bristles when a thick piece of cloth is interposed.

With continued reference to the drawing, my dry cleaning apparatus is shown in complete perspective in Figure 1, and comprises generally a base or housing 10, a roller brush assembly 11, fluid spray mechanism 12, and means 13 for operating and driving the device during use.

Base or housing 10 consists of a side wall structure 14 having an elevated rear portion 15 which houses the drive and mechanism for the brushes and spray system. The base 10 also is provided with a removable table top 16 having openings formed therethrough for proper operation of the brushes and to permit excess fluid to flow therethrough. A large opening or slot 17 is disposed transversely of table top 16 while smaller openings 18 are formed through the area of table 13 adjacent the large transverse slot 17. The flow of excess fluid on table top 16 may, therefore, return through the openings 18, as well as 17.

Also forming a part of the base 10 is a reservoir 19 which underlies the openings 17 and 18, as shown particularly in Figure 3. The reservoir 19 is provided with a lower screened outlet 20 which communicates with a return line 21 for bringing excess fluid back to pump 22 which, in turn, is mounted on a support 23 secured to inner walls 14 of base 10 by such means as bolts 24. Pump 22 forces the returned fluid through a multiple branch fixture 25, branching off to separate lines 26, 27 and 28. A valve 29 is interposed in line 27 and a valve 30 is interposed in line 28, as shown. The valve members may extend outwardly of the rearward extension 15, as shown in Figure 1, so that the fluid supply may be controlled readily by an operator. Line 28 terminates within the reservoir 19 and below table top 16 in a nozzle 31 which is, in turn, provided with upwardly directed orifice 32 for wetting cloth to be cleaned and for maintaining the roller brush assembly 11 in moist condition. The other fluid line 27 terminates in a nozzle 33 having a spray orifice 34, as shown in Figure 3, which is directed toward the roller brush assembly from above the table top 16. The line 26 terminates within the reservoir 19 in a perforate agitator tube 35 lying against the bottom thereof for maintaining the recirculated fluid in a more-or-less homogeneous condition. A hood or shield 36 of transparent material overlies the roller brush assembly 11 and may be secured to the upper portion 15 of the base 10, as shown in Figure 1.

The roller brush assembly 11 comprises a first roller brush 38 which rotates on a fixed axis disposed below the table top 16 in such a manner that bristles 39 will normally extend slightly above the upper plane 40 of table top 16. An axial shaft 41 of the roller brush 38 is journaled in bearings 42 and 43, as shown in Figure 4. The bearings 42 and 43 are mounted in fixed relation to the housing or base 10 as shown. A second roller brush 44 is journaled in a pair of bearings 45 and 46 in such a manner that the axial roller shaft 47 lies generally parallel with, and above, the axial roller shaft 41 of roller 38. The bearings 45 and 46 are mounted for vertical floating in the respective bearing mounts 48 and 49, which, in turn, are secured to the housing or base 10. The shaft 47 is continuously biased downwardly by means of compression springs 50 which are interposed between the bearing mount 48 and the floating bearings 45 and 46, respectively. The net effect of the floating mount is, of course, to bring the bristles 51 of the upper roller brush 44 into meshed engagement with the bristles 39 of

lower roller brush 38 when those brushes are in dormant relation.

The prime mover for the drive mechanism 13 is motor 52 which is provided with a shaft 53 upon which are mounted three sheaves 54, 55 and 56, as shown in Figure 4. The sheave 54 is aligned with sheave 57 which, in turn, is mounted on the floating shaft 47 and is interconnected by an angulated V-belt 58, as shown. The V-belt 58 has enough natural resilience and yield in its contact with the sheaves 54 and 57 to permit the required vertical movement of shaft 47. The motor sheave 56 is aligned with a sheave 59 mounted on the roller shaft 41 and driven by V-belt 60. Another sheave 55 is aligned with sheave 61, secured in turn, to pump shaft 62 and journaled in bearing 63 which, in turn, is secured to the mounting base 23, as shown in Figure 4. Belt 64 interconnects the sheaves 55 and 61 for operating pump 22 whenever the prime mover 52 is energized.

Motor 52 may be energized through an electrical conduit 65 which is connected to a switch 66 secured to a lower portion of the housing or base 10. A foot pedal 67 is pivotally mounted on switch 66 for controlling the operation of motor 52. An external source of electrical current (not shown) is connected to the switch 66 in the normal manner.

In the use and operation of my dry cleaning apparatus, the motor 52 is energized by means of the foot pedal 67 and the fluid pump 22 is caused to circulate dry cleaning fluid from the inlet 20 through the opened valves 29 and 30 so as to be ejected from the respective nozzles 31, 33 and 35.

Referring now to Figure 5, a garment having thin fabric 68 is placed on the table top 16 over slot 17 and between rotating brushes 38 and 44. The bristles 39 and 51 of the respective brushes are soft in nature and, hence, will come out of their intermeshed engagement to bear against the respective upper and lower sides of cloth 68 in the manner shown in Figure 5. The bent bristles at the point of contact define substantially a plane which is approximately in alignment with the upper surface of table top 16. The pressure of springs 50 will cause the roller brush 44 to bear against roller brush 38 with a predetermined amount of force, causing the bristles 39 and 51 to gently work in opposed relation in the plane specified without exerting any appreciable degree of pull or distortion upon the thin cloth 68.

Referring now to Figure 6, a much heavier piece of clothing such as a man's overcoat may be inserted at an area 69 between the respective roller brushes 38 and 44 with the motor energized as before. Since the roller shaft 41 remains fixed with respect to the table top 16, the bristles 39 thereof will bend to the same degree as previously described in connection with the thin and delicate cloth 68. However, since cloth 69 is many times thicker, the roller brush 44 will rise in its resilient mounting against the compression of springs 49 and 50. The bristles 51, however, will still maintain substantially their same bent configuration, exerting approximately the same degree of brushing force.

In either case, the lower surface of the cloth will lie in approximately the same plane as that of the upper surface of table 16, while the upper surface of the cloth lies higher to a greater or lesser degree depending on the thickness of the cloth. Only the roller shaft 47 and the upper brush 44 move relatively upward to accommodate a thicker cloth, yet keeping the cloth flat irrespective of the thickness thereof.

The sprayed fluid which is ejected from the respective nozzles 31 and 33 will saturate the cloth in either case and will maintain the brushes 44 and 38 in moist condition during the operation. Shield 36 prevents splattering of fluid above the table top 16 and the table top itself prevents splattering of the fluid from the bristles of lower brush 38. Excess fluid returns through the main slot 17 as well as the smaller openings 18 to the reservoir 19 from which it is, in turn, recycled to the opening 20.

It may thus be seen that I have provided a novel and useful dry cleaning apparatus which will gently and effectively clean cloth material ranging from delicate artificial fibers to coarse and thick material.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention.

What I claim is:

1. Apparatus for drycleaning soiled cloth which comprises, a table top having an opening formed transversely therein, a cylindrical brush having soft and flexible bristles rotatably mounted in fixed bearing relation below said table top and having its normal circumference extending slightly above the plane of the table through said transverse opening, a second cylindrical brush having soft and flexible bristles mounted on a substantially parallel axis above the first named cylindrical brush, a spring suspended bearing mount for said second cylindrical brush vertically shiftable toward and away from said table top and the fixed axis brush, and a resilient belt drive for rotating said brushes and biasing said second cylindrical brush towards the fixed axis brush whereby the normal circumferences of each of said cylindrical brushes will intersect when non-operative and will form an intersecting plane substantially in alignment with that of the table top when in rotating condition during operation.

2. A device for cleaning soiled clothes which comprises, a base structure, a table top having a cloth-supporting upper surface and a transverse opening formed therein, a cylindrical brush rotatably mounted with its axis in fixed bearing relation with respect to the table top and having soft and flexible bristles, the normal circumference of which extend slightly upwardly through the transverse opening, a second cylindrical brush having soft and flexible bristles and lying axially parallel to and above the first mentioned brush, a spring-mounted bearing assembly for said second cylindrical brush, a flexible belt drive assembly for rotating both of said cylindrical brushes, said drive assembly urging the upper brush downwardly toward the lower brush and in normal bearing contact therewith whereby to deflect the bristles of the brushes at the area of contact and thereby define a plane substantially aligned with that of said table top, a reservoir underlying said table top and housing the fixed-axis cylindrical brush, and means adapted to spray dry-cleaning fluid downwardly toward the table top and upwardly therebeneath to saturate cloth as it is being cleaned, said cloth being adapted to be supported for movement in flat sliding contact over said table top and between the respective brushes in the plane of contact.

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