May 19, 1931. S. CHASE, 4TH., ET AL 1,806,237

CARPET CLEANING MACHINE

Filed March 2, 1925

Fig. 1.

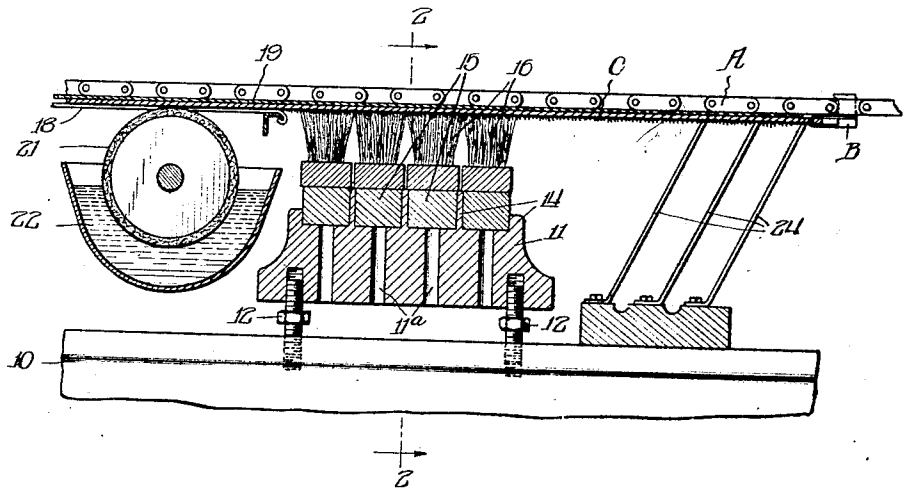
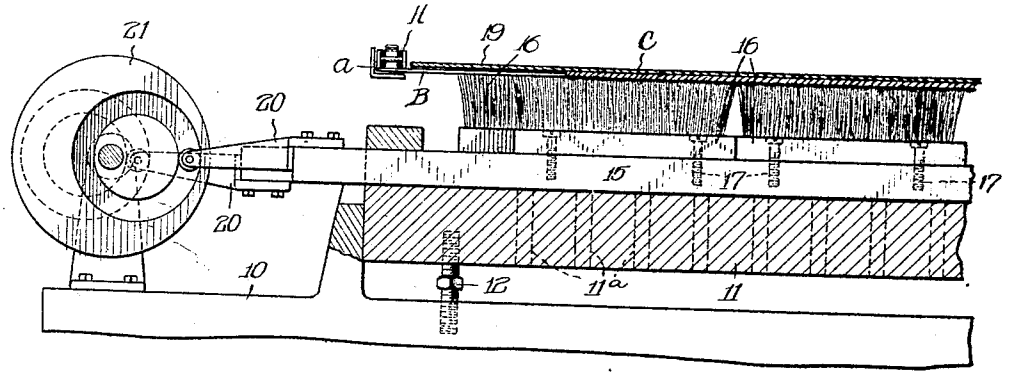


Fig. 2.



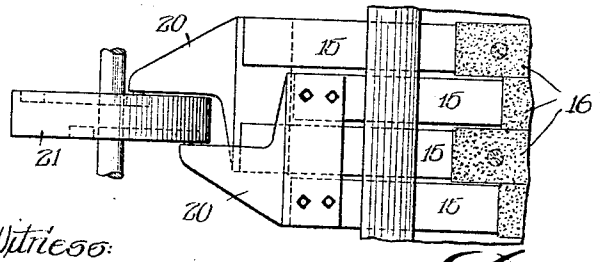


Fig. 3.

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Patented May 19, 1931

1,806,237

UNITED STATES PATENT OFFICE

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CARPET CLEANING MACHINE

Application filed March 2, 1925. Serial No. 12,516.

This invention relates to machines for the cleaning or renovating of fabrics such as carpets and rugs. It is of particular advantage in installations where the cleaning operations are carried on in an automatic fashion, incident to a continuous progressive feed of the material which is operated upon.

One of the objects of the present invention is the provision of an improved brushing or scrubbing apparatus which will be effective to apply cleansing treatment to interior portions of heavy fabric, such as a high pile carpeting, with minimum destructive surface abrasion.

Another object is the provision of a mechanism which will operate automatically to apply the desired scrubbing treatment to the intended surface of the fabric without working the soap or other cleansing solution on to the back surface of the fabric. This is of particular importance in the automatic cleaning of rugs of different sizes.

Another object is the provision of mechanism which will prevent wrinkling, shrinking and stretching of the fabric during the scrubbing operation.

Another object is the provision of a mechanism which will subject all portions of the surface of the fabric to uniform scrubbing, and be highly effective at the edges, which portions are particularly likely to be dirty in rugs.

Another object is the provision of a mechanism which is easily installed and operated and occupies but little space, so that it may be installed in a carpet cleaning machine either as a unit or as a series of units.

Another object is the provision of such a mechanism which may be kept in adjustment and repair easily, which permits adjustments for compensation for wear or different thicknesses of the fabric operated upon, which is largely self-cleaning and self lubricating and which may be operated at varying speeds.

Another object is the provision of a mechanism which will be economical in consumption of soap or other cleansing material, even though continued in operation when no material is being operated upon. This is of particular importance where a succession of rugs is to be cleaned.

Other and further objects of the invention will be pointed out hereinafter, indicated in the appended claims, or obvious to one skilled in the art upon an understanding of the instant disclosure.

For the purpose of this application we have elected to portray an embodiment of the invention by means of diagrammatic illustration in the drawing forming a part of this specification. It is to be understood, however, that the actual constructions therein shown are to be considered as simply illustrative, as our invention, once its principle is understood, may be embodied in a great variety of fashions by one expert in the art.

In said drawings:

Fig. 1 is a diagrammatic sectional elevation of mechanism illustrative of the nature of our invention, said section being a longitudinal one, taken parallel to the line of travel of the article being operated on.

Fig. 2 is intended to represent a partial transverse sectional elevation, taken at the side of the machine; and

Fig. 3 is a detail in the nature of a part plan view of the end portion of the scrubbing mechanism.

It will be understood that the parts of the mechanism illustrated in these figures are designed to be incorporated in a machine which is equipped to transmit a sheet of fabric in the nature of a piece of carpet, a rug or the like, progressively with the surface which is to be subjected to the scrubbing operation presented downwardly. Such a means is here diagrammatically illustrated by the chain A which is moved longitudinally on a track *a* and which carries a clamp B which is a stiff member that extends across the machine and engages the sheet of fabric C along its forward margin so as to convey it through the machine in an outspread condition.

Such machine comprises a suitable frame including a portion, designated by the reference character 10, which forms a support for a guide member 11, which is vertically adjustable, as by means of screws 12. This

guide member is formed with upwardly extending guide flanges 14, between which are disposed brush bars 15 arranged collaterally for reciprocation longitudinally on the guide member. Upon the brush bars 15 are mounted the brushes 16, same preferably being formed in sections which are demountably fastened to the bars 15 as by means of the bolts 17. It will be understood that the guide member 11 and the bars 15 are arranged to extend transversely of the direction of feed of the fabric. A support for the fabric during its movement to the brushes is afforded by a series of wires 18 which extend longitudinally of the machine in the direction in which the fabric is transmitted, which wires terminate adjacent the brushes in such relationship that a sheet of fabric moving from them has its lower surface presented in contact with the bristles of the brushes. Over the wires and brushes lies a smooth retaining plate 19 properly supported on the machine frame in such fashion as to retain the sheet of fabric upon them. The ends of the bars 15 project laterally as illustrated in Figs. 2 and 3, and the ends of the alternate bars are connected by yoke members 20. These yoke members have operative connection with an actuating means such as the cam 21, whereby reciprocating motion is transmitted to the bars in such fashion that the coincident reciprocating movements of juxtaposed bars are in opposite directions. In such fashion the brushes are transmitted across the sheet of fabric incident to its progressive movement so that its under surface is subjected to the scrubbing action of the bristles.

Ahead of the brush unit there is supported on the machine frame the soaping roller 21, which is supplied with gelatinous soap solution, or other cleaning material, from a trough 22. This roller is disposed with its periphery tangent to the sheet of fabric supported on the wires 18 and is rotated by suitable mechanism to pick up material from the trough 22 and apply it to the under surface of the fabric incident to the progressive movement of the latter over the roller. Back of the brush unit is supported a suitable wiping or squeegee device 24 arranged to wipe or squeeze material from the under surface of the sheet of fabric incident to its progressive movement thereover.

In operation of the apparatus, the sheet of fabric is drawn by the conveyor chains and clamp progressively through the machine in the direction indicated by the arrow in Fig. 1, with the surface to be subjected to the scrubbing operation presented downwardly, being held in a flat out-spread condition by the clamp and the retaining plate 19. As the fabric moves over the soaping roller 21 it receives a uniform application of cleaning material which it carries with it as it moves on to a position over the brushes. The reciprocating action of the latter works the cleaning material into the fabric and subjects it to a thorough scrubbing action effective to loosen the dirt and cause it to be taken up by the cleaning material. With the brushes disposed in close collateral association and the juxtaposed brushes moving in opposite directions, the fabric is held flat between them and the retaining plate 19, so that it will not be wrinkled or stretched by the rubbing action of the brushes. This is of particular advantage at the margins of the fabric, as there is it also held flat against the retaining plate and the cleaning material prevented from working back on to its upper surface. It will be seen that each portion of the fabric is subjected to the action of each of the brushes in turn so that all portions of its surface are thoroughly scrubbed. Passing from the brushes the fabric moves into contact with the wiping device 24 which cooperates with the retaining plate 19 to squeeze out and wipe off the cleaning material, which carries away with it the dirt which it has picked up during the scrubbing operation. In the use of gelatinous soap solution, such as is quite generally employed in the cleaning of carpeting, this apparatus is of particular advantage in that it works the solution thoroughly into the heavy pile surface of the fabric without frothing it up into a light lather and throwing it about onto other portions of the apparatus. While wet, the soap solution forms an effective lubricant for the reciprocating bars, and any excess which finds its way into their seats is drained away through channels 11ª provided in the guide member. By adjustment of the screws 12 the height of the brushes may be varied to compensate for the wearing down of their bristles and to accommodate them to fabrics of different thicknesses. Another advantages gained by the transversely reciprocating brush arrangement accrues from the fact that in practically all high pile rugs and carpets the weft of the fabric runs transversely. Consequently the transverse movement of the brushes is effective in obtaining a deep penetration of the cleaning material between the weft yarns and the extraction of the dirt from those places, where it has the greatest accumulation. A scrubbing action longitudinally of the fabric is at the same time obtained by its progressive movement in contact with the brushes.

It will be understood that while we have illustrated and described only a single unit, that a plurality of the same may be incorporated in the machine, so that the fabric in the course of its passage through the latter, is subjected to a series of scrubbing and wiping operations. The apparatus is of great practical advantage because it does not waste cleaning material and may be operated con-

tinuously to scrub a succession of rugs and the like and because it may be assembled in a relatively small floor area.

We claim:

1. In a fabric cleaning machine, in combination, a retaining plate for a sheet of fabric, means for moving fabric progressively on said plate, brushes arranged collaterally below the plate for contact with fabric thereon, means for reciproacting juxtaposed brushes simultaneously in opposite directions and means for adjusting the brushes toward and from the plate.

2. In a fabric cleaning machine, in combination, a conveyor operable to move a fabric progressively in out-spread condition, brushes disposed collaterally below the conveyor for operation on the fabric and means for simultaneously reciprocating juxtaposed brushes in parallel opposite directions transversely of the direction of movement of the conveyor.

3. In a fabric cleaning machine, in combination, means for moving the fabric progressively, collaterally arranged brushes extending transversely below the path of the fabric, means for simultaneously reciprocating juxtaposed brushes in parallel opposite directions, means ahead of the brushes for applying cleaning material to the fabric and means behind the brushes for removing cleaning material from the fabric.

In testimony where we have hereunto subscribed our names.

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