July 11, 1933. H. L. SHUTTLEWORTH 1,917,555

METHOD OF FINISHING CARPETS

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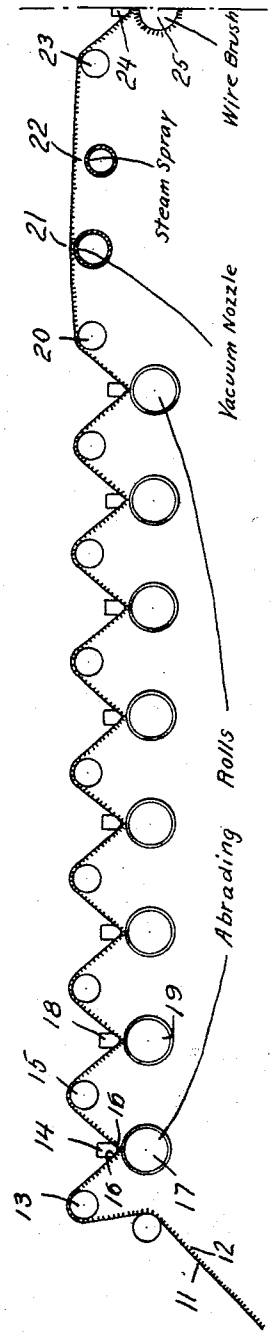


Fig. 1A.

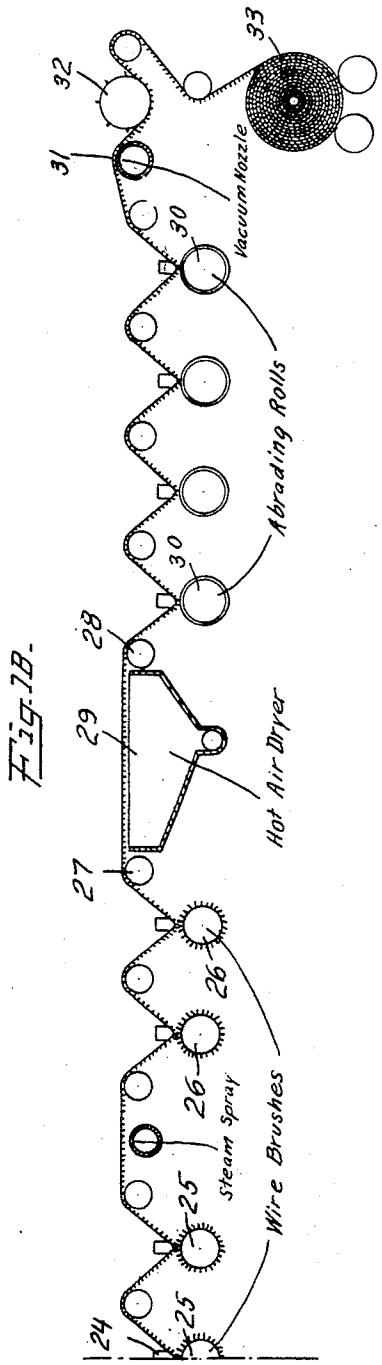


Fig. 1B.

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METHOD OF FINISHING CARPETS

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This invention is concerned with a method of finishing fabrics and particularly with a method of softening the appearance of pile fabrics such as carpets or rugs and giving a sheen to the pile.

Rugs and carpets are generally a woven pile fabric having a dyed wool pile and, when the fabric has been woven and the pile evenly trimmed, the feeling and appearance is still rather harsh and unpleasant and lacks the softness and uniformity which is desirable and representative of the better qualities of fabric.

One of the main reasons for the harsh appearance of the fabric is the scales which are attached to the wool fibres and make the pile look rough and dull. It is customary to wash these rugs or carpets in a chemical bath to remove these scales from the wool fibre and thus soften the appearance and feel of the carpet, but this process is expensive and has the disadvantage that it often changes the colors in the carpet and weakens the fibres in the pile so that the wearing qualities of the rug are seriously impaired.

In order to overcome these difficulties and produce a carpet having a soft luxurious feel and appearance and to give the pile the desired sheen, but not impair the wearing qualities thereof, I have devised the process of this invention. This process not only accomplishes these results and eliminates the necessity of washing but is far cheaper to carry out than the usual washing process and requires very little equipment.

According to the new method, the fibres making up the pile are broken up and spread apart and the scales removed from the fibres by mechanical abrasion. The abrading action may be carried on by means of any suitable abrasive mechanism employing sandpaper, emery cloth, ground glass, abrasive wheels, or the like, although I prefer to use rolls or belts having an abrasive surface which may be forced against the surface of the pile under regulated pressure so as to effect removal of the scale from the pile fibres for a substantial distance, the depth in the pile to which the scales are removed being dependent upon the pressure with which the fabric is acted on, the duration of the operation and the kind and condition of the fabric used.

In addition to the abrading operation described, the new method includes a series of operations performed on the fabric to complete the finishing treatment, these steps in the method including removal of the loose fibres and abrading material from the treated fabric, steaming the pile to raise or straighten it, and brushing the pile surface. Preferably, the abrading action is carried on in two stages with the fabric cleaned, steamed and brushed after each stage.

For a better understanding of the invention, reference may be had to the accompanying drawing in which there is illustrated schematically mechanism for performing the successive steps of the method.

In the drawing a carpet or rug 11 having a pile 12 is fed over a supporting roller 13, under a bar 14 and over another supporting roller 15. The bar 14 is lower than the rollers 13 and 15 and has an angularly cut face 16 around which the carpet passes, the bending of the carpet in its movement beneath the bar spreading the pile and making accessible the individual tufts thereof. Below the bar 14 is a rotating roll 17 carrying sandpaper, emery cloth or the like upon its surface and bearing against the carpet as it passes under the bar. This roll is driven by any suitable source of power and is forced against the carpet resiliently, as by means of springs or a weight.

Instead of being surfaced with abrading material, the roll may be made of steel with its surface formed with sharp corrugations or cutters which produce the abrading effect.

After passing over the roller 15 the carpet passes under a second bar 18 where a second abrading roll 19 rotating in the opposite direction from the first abrading roll contacts with it and abrades the opposite sides of the pile fibres and at the same time causes a rearranging thereof. The carpet may then pass over additional rolls and under additional bars and the abrading may be repeated until the fibres have been thoroughly treated.

The carpet passes from the last roll, a sup-

porting roller 20 and over a vacuum nozzle 21 where the loose fibres and the abrading material detached from the abrading rolls are removed from the pile.

From the vacuum nozzle the carpet passes over a steam spray 22 and thence over a supporting roller 23, and under a bar 24 similar to the bar 14 where the pile is spread. While the pile is in the spread condition it is brushed by a driven wire brush 25 which is pressed against it by means similar to those used with the abrading rolls. In the process illustrated, the carpet is steamed, brushed, steamed, and brushed again by brushes 26, each brushing operation thus being carried on by means of a pair of brushes.

After the carpet has passed the brushes it passes over supporting rollers 27 and 28 between which is located a hot air dryer 29 from which the carpet may pass into contact with a second series of abrading rolls 30 and over a final vacuum nozzle 31, the rolls 30 preferably running all in the same direction. Beyond the nozzle 31 a driven roll 32 with spikes in its surface pulls the carpet through the apparatus and it is wound into a roll at 33.

I have described the new method as involving abrasion of the pile while it is in a flexed condition so as to break apart the pile fibres as the fabric passes beneath the bars 14 just above the abrading devices, but it may be desirable in some instances to abrade the fabric in a flat position or to flex it to a less degree during abrading than has been illustrated.

Various other changes may be made in carrying out the new method as will be apparent to those skilled in the art. For example, the number of abrading operations employed and the kind of abrading devices used in each operation will vary with the character of the goods being treated and the effect that is desired. The new method may be employed on fabrics either with or without preliminary washing and various types of abrasive devices and abrasive materials may be made use of. Similarly, the number and kind of brushing devices employed will vary with the type of material being treated.

I am aware that it has been proposed heretofore to brush pile fabrics with wire or bristle brushes in order to remove loose fibres and straighten the pile but such brushing operations do not achieve the same results as are obtained by my method since the brushing does not effect removal of the scale from the fibres nor produce the sheen and soft appearance which is accomplished by abrading.

I claim:

1. A method of finishing a pile fabric which comprises subjecting the pile surface to abrasion in opposite directions to remove the scales from the fibres of the pile to a substantial depth and soften the appearance of the fabric.

2. The method of finishing a pile fabric which comprises subjecting the pile surface to abrasion in a plurality of directions while the fabric is bent to loosen the pile, said abrasion removing the scales from the pile yarns to a substantial depth removing the loose material from the pile, and steaming and brushing the fabric to remove the remaining loose fibres and rearrange the fibres of the pile.

3. The method of finishing a pile fabric which comprises subjecting the pile surface to abrasion in a plurality of steps, said abrasion removing the scales from the pile yarns to a substantial depth, removing the loose material from the pile, moistening the pile to raise it, brushing the pile, and again abrading the pile surface.

4. The method of finishing a pile fabric carpet to remove the scales from the fibres of the pile and soften the appearance of the fabric, which comprises bending the fabric to loosen the pile, abrading the bent fabric in a plurality of directions, removng loose material from the fabric by vacuum, removing the remaining loose fibres and rearranging the pile by steaming and wire brushing the fabric in a plurality of directions, drying the fabric, again bending and abrading the fabric and again removing the loose material from the fabric by vacuum.

5. A method of finishing a pile fabric which comprises removing the scales from a substantial length of the pile tufts by abrasion, steaming the pile surface to raise the pile, brushing the pile, and again abrading the pile.

6. A method of finishing a pile fabric which comprises removing the scales from a substantial length of the pile tufts by abrasion, cleaning the pile by vacuum action, raising the pile by steaming and brushing, and again abrading the pile.

7. A method of finishing a pile fabric which comprises removing the scales from the tufts by abrasion to a substantial depth, raising the pile by steaming and brushing, drying the pile surface, and abrading the dried surface.

8. A method of finishing a pile fabric which comprises abrading the pile from opposite directions to remove scales from the pile yarns to a substantial depth, raising the pile by steaming and brushing, and again abrading the pile.

In testimony whereof I affix my signature.

HOWARD L. SHUTTLEWORTH.