Dec. 17, 1940. M. R. GREISER 2,225,497

METHOD AND APPARATUS FOR TREATING PRINTED RUGS

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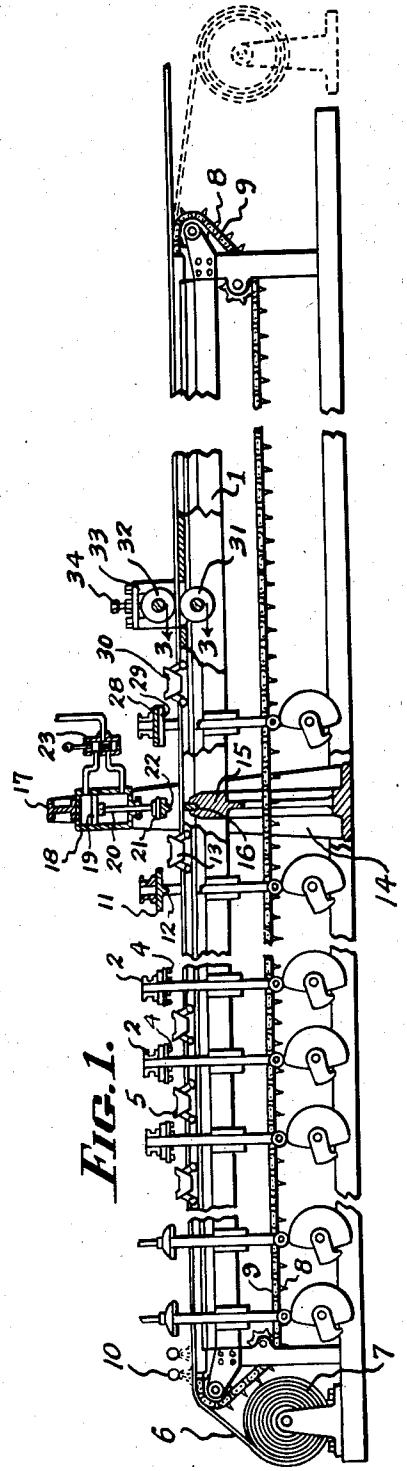


FIG. 1.

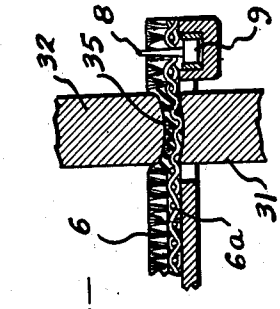


FIG. 3.

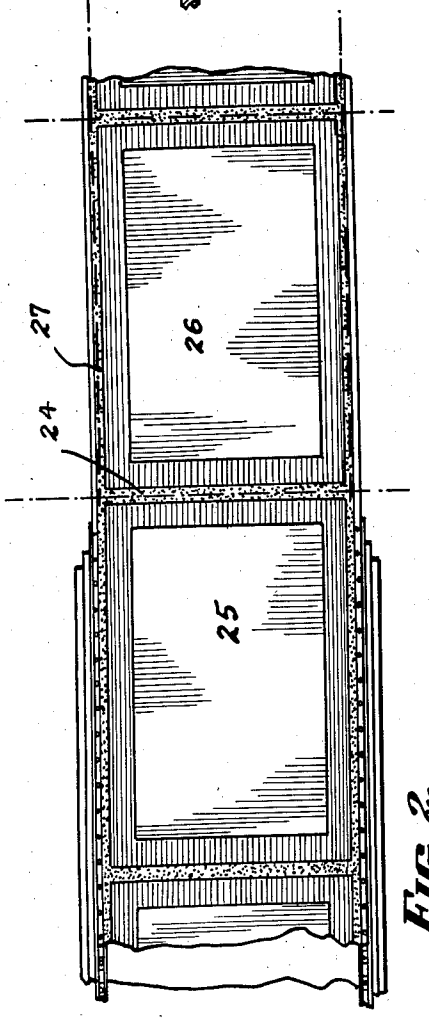


FIG. 2.



FIG. 4.

INVENTOR.
MELVIN R. GREISER
BY Allen & Allen
ATTORNEYS.

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METHOD AND APPARATUS FOR TREATING PRINTED RUGS

Melvin R. Greiser, Cincinnati, Ohio, assignor to Carthage Mills Incorporated, Carthage, Ohio, a corporation of Ohio

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3 Claims. (Cl. 91—67.9)

A market has been created in recent years for rugs made of a fabric characterized by a pile and bearing a design formed by a printing operation.

My present invention is not limited as to the kind or character of fabric being treated but is directed to the solution of certain problems common to all woven fabrics of the general class referred to, which are printed upon printing machines of the general type heretofore employed in the manufacture of felt base flooring. The printing machine employed, and the one which I shall briefly describe for the purpose of making an exemplary disclosure, is a step-by-step printing machine having a table, a plurality of vertically reciprocable printing blocks and a plurality of horizontally reciprocable die fountains or pans for coating the printing surfaces of the blocks, together with suitable means for operating these elements. Lengthwise of the table and at either side there are moving conveyor means having pointed pins upon which the edges of the so-called web of soft goods are impaled. These means not only tend to keep the web stretched across the table but also have to do with the movement of the web to bring it to proper registry beneath the printing blocks. The printing of the rug design is done wholly within the impaled edges so that when the printing of the rugs is finished, the edge portions of the sheet have to be cut off as by means of rotary slitters. Also, since the printing is done on long webs, the web has to be severed in the space between rugs. Thus when the printing is done upon material comprising a woven fabric base as is usual, there will be no woven selvedge edge in the completed rug since all edges have been formed by a slitting or shearing operation. It has been the practice in the past to use fabrics which have been given one or more back coatings of rubber latex so that the rubber tends to prevent fraying and raveling of the rug along the cut edges. This, however, is a matter of very considerable expense, and it is an object of my invention to permit the use of fabrics which have not been treated as described, while making these fabrics non-raveling at their edges.

It is an object of my invention to provide a novel means and a method for treating rugs at the edges to prevent fraying and raveling, which process and means are economical and can be used and practiced during the ordinary operation of making the rug without interruption thereof. It will be understood that these rugs are printed face side up, and also that the slitting operation for cutting away the perforated side edges is usually practiced immediately after the completion of the printing operation. It may be pointed out that it is the side edges of the rug which present the greatest problem because many rugs are provided with fringe at the ends and the sewing of the fringe to the ends of the rug usually is effective in preventing fraying at the ends.

The several objects of my invention which have been pointed out hereinabove or will be apparent to one skilled in the art upon reading these specifications, I accomplish by that certain structure and arrangement of parts of which I shall now describe the aforesaid exemplary embodiment. Reference is made to the drawing wherein:

Figure 1 is an elevational view with parts in section of an exemplary machine embodying my invention.

Fig. 2 is a plan view of a strip of material after having been given my treatment.

Fig. 3 is a sectional view through the machine taken along the lines 3—3 of Fig. 1 and showing the action of pressure members.

Fig. 4 is a sectional view of the edge of a completed rug.

In Fig. 1, I have shown a machine comprising a bed 1, above which are mounted for vertical reciprocation certain frame members 2, carrying printing blocks indicated at 4. There are the usual mechanical means for actuating these printing blocks. Pans 5 are mounted for horizontal sliding movement on the bed and contain the ink or dye used to coat the printing blocks. Before the making of an impression the blocks are coated, as is well understood, by rolls in these pans, the pans and rolls sliding beneath the blocks. A web of fabric 6 is shown as being unwound from a roll 7 and as being impaled upon the points 8 of a chain conveyor member 9 so as to carry it along the bed of the machine. In following the practice of my copending application, the sheet or web is first treated with a mordant as at 10, after which the printing is carried on by means of the printing blocks. This obviates the use of mordant with the dye and gives a better printing operation. The machine in Fig. 1 is shown diagrammatically and considerably fore-shortened. It will be understood that there will be a series of printing blocks for printing the main design of the rugs and also a series of printing blocks for printing the end border designs, as is well understood in this art.

My invention is based upon my discovery that I can print rubber latex onto the face of the fabric with suitable printing means and then by the immediate application of pressure means drive the latex down through the pile of the fabric and into the base web thereof, all as a continuous operation and without interruption of the printing.

To this end I have shown in Fig. 1, a printing block 11 arranged for reciprocation in the ordinary way and so actuated by the mechanical movement means of the machine that it will print between the end borders of adjacent rugs. This printing block has essentially a long narrow printing surface 12 extending across the sheet substantially from side to side, and so located as to print between the end borders of the rug. The printing surface 12 is fed with rubber latex or other suitable substance for the purpose, by means of the ordinary printing pan or fountain 13 actuated in the usual manner.

After the rubber latex has been printed upon the web at the place indicated, the web moves forward a step as in current practice in these machines, and comes between the cooperating parts of a pressure mechanism which I will now describe. On standards 14, one on either side of the machine, I mount a cross bar 15 beneath the table and bearing a pressure die 16, the standards 14 having a cross head 17 located above the table. One or more pressure means, such as fluid pressure cylinders 18, are located on this cross head and the pistons of these cylinders 19 are connected by means of rods 20 to a head 21 bearing a cooperating pressure member 22. A suitable valve 23 may be provided to actuate the cylinder or cylinders 18 and thereby to move the head 21 to bring the pressure elements 16 and 22 together under great force.

Thus immediately after the web has been printed by the printing surface 12 with a line of latex 24 (see Fig. 2) lying between adjacent rugs 25 and 26, the movement of the mechanism brings the line 24 between the pressure members 16 and 22. These by the operation of the valve 23 (it is within the skill of the man in the art to couple up this valve with the operating mechanism of the machine so as to give to the movement of the head 21 the same time relationships as have the movements of the printing heads) are brought together against the fabric, and before the latex has dried, it is squeezed down into the base web or webs of the fabric.

It is within the scope of my invention to apply pressure to the printed latex surface in any way desired. I have illustrated a fluid pressure cylinder arrangement as exemplary only of my invention. Other mechanical or electrical devices may be employed.

For the treatment of the side edges of the fabric as at 27 in Fig. 2, I provide additional printing means. These comprise one or more printing heads 28 in Fig. 1 having printing surfaces 29 located near the edges of the web and extending longitudinally. The printing surface 29 is fed with latex from a suitable pan 30. The result of the operation of the printing head or heads 28 is to form a printed line of latex at the edges of the rug. I can, if preferred, provide the same general type of pressure means for treating these lines of latex; but because the fabric upon which the rug designs are being printed has a longitudinal movement, I have found it possible to provide a simpler continuously acting mechanism. I have shown such a mechanism in Fig. 1, where 31 indicates a roll journaled beneath the table, and 32 a roll journaled thereabove in bearings slidable in a housing 33 having suitable screw down or pressure control means 34. The rolls 32 and 31 need not be substantially wider than the printed strip of latex 27. An action is shown in Fig. 3. Advantageously one of the rolls may have slightly convex outer surfaces, the outer surfaces of the other roll being correspondingly concave. Fig. 3 indicates how the latex 35 is squeezed down into the compressed fabric so as to penetrate the base web 6a thereof.

Usually the active compression of the rubber latex squeezes so much water out of it as to cause coagulation thereof, eliminating the necessity of a separate drying operation. In any event, when the latex has set, the rugs may be slit or sheared in the areas 27 or 24 without fraying or raveling. Depending somewhat upon the quantity of latex employed, it will be found that the portion of the rug subjected to compression has its nap matted and bound by the latex; but this forms only an exceedingly narrow margin at the edges of the rug and is ordinarily entirely unobtrusive and inconspicuous when the rug is in use. Normally the width of the compressed area along the side of a rug after shearing will be of the order say of a quarter of an inch, and in some instances less. Nevertheless binding of the threads of the base or body fabric together by means of latex prevents fraying or raveling of the base fabric, and the same effect is secured in this regard as would be secured by an exceedingly expensive operation of coating the whole of the rear face of the rug fabric with latex. Moreover, I have succeeded in securing this effect by an operation which does not interrupt the printing, which is a printing operation itself, and which is carried on essentially from the same side of the rug as is the design printing, so that there is no problem in my method of reversing the fabric and backcoating it. The operation does not slow up the printing since it is carried on in timed relationship to it, does not require a great quantity of extra machinery and is very simple and easy to perform. It gives an adequate non-raveling effect and some measure of anti-slippage effect at the edges of the rug.

Modifications may be made in my invention without departing from the spirit of it, as will be evident. Likewise, there are a number of equivalents for the particular mechanism shown, and it is well within the skill of the worker in the art to adapt the teachings of this specification to the printing of rugs by other means, all without the exercise of invention. Consequently, I desire the appended claims to be construed as not limited otherwise than as set forth in their express terms.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A method of making pile fabric rugs which includes the steps of printing on the pile face of a web transverse bands and longitudinal marginal bands with a latex cement, pressing said cement bands into the fabric and slitting said treated fabric along lines intermediately through said bands whereby to produce individual rugs having edge portions which will not ravel.

2. A method of making pile fabric rugs which includes the steps of printing on the pile face of a web transverse bands and longitudinal marginal bands with a fluid rubber, pressing said fluid rubber into the fabric and slitting said treated fabric along lines intermediately through

said bands whereby to produce individual rugs having edge portions which will not ravel.

3. A method of making so-called soft goods rugs characterized by a pile and having a base comprising a woven fabric which includes the steps of printing a design on the face of such fabric, and concurrently printing marginal portions and transverse bands on the pile face with a latex cement, and immediately thereafter treating said portions which have been printed with latex cement, with heavy pressure to force said cement into the fabric, and slitting said fabric along lines intermediately through said cement treated portions, whereby to produce individual rugs having edge portions which will not ravel.

MELVIN R. GREISER.