

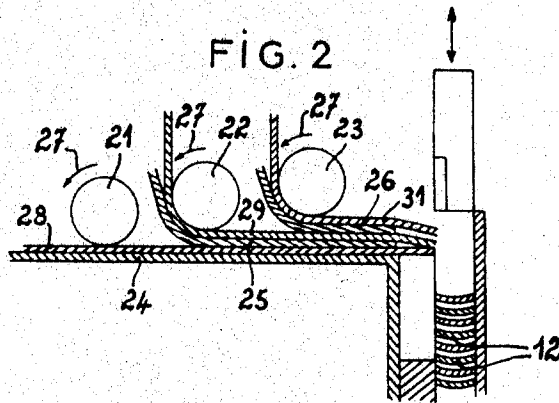
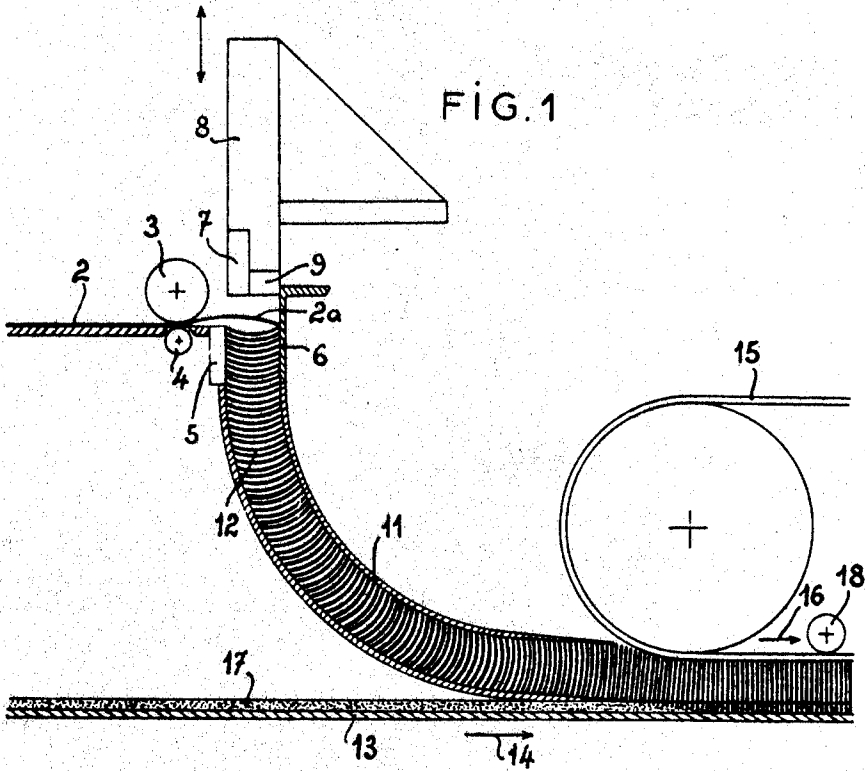
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P. J. M. PARTENSKY

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METHOD AND APPARATUS FOR MAKING NONWOVEN PILE FABRICS

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INVENTOR

PIERRE JEAN MARC PARTENSKY

BY *Young & Thompson*
ATTYS.

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**METHOD AND APPARATUS FOR MAKING
NONWOVEN PILE FABRICS**

Pierre Jean Marc Partensky, Lyon, France, assignor to
B.T.B. Benoit-Le Tapis Brosse, Societe Anonyme, Lyon, France

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4 Claims

ABSTRACT OF THE DISCLOSURE

Nonwoven pile fabrics are manufactured by embedding the pile in a plastic support or backing. A sheet of yarn is pushed against a wall at the mouth of a downwardly extending passage, and a blade shears the yarn against an edge of the passage, to cut the pile. The blade has a heel that presses the pile down the passage, from which it emerges between conveyor belts one of which supports the plastic layer and the other of which pushes the cut pile into the plastic layer.

The present invention concerns the production of nonwoven pile fabrics, such as carpet by embedding the pile into a support or backing of plastics material.

According to the invention a method for the manufacture of nonwoven pile fabrics by embedding the said pile in a support or backing of a plastics material is characterised in that it includes the steps of repeatedly pushing a sheet of yarn against a wall in such a way that each end of the pile is slightly bowed, and cutting the sheet at the desired length by a cutting device having a mobile blade and push heel which introduces the rows of cut pile thus obtained into a smooth passage which extends and has its outlet such that the rows of pile are introduced between a conveyor belt 13 on which an adhesive support has been deposited and a driving belt 15 which applies the rows to and embeds them in the adhesive support carried by the first mentioned belt, the speed of the two belts being equal or different according to whether a fabric having a straight or inclined pile is desired.

This method has the advantage of not causing any transverse displacement of the pile after embedding in the adhesive support end, in consequence, does not produce in this support the formation of irregularities.

Also according to the invention a machine is provided for carrying out the method aforesaid characterised in that it includes two superimposed feed rollers adapted to feed repeatedly a horizontal sheet of yarns or fibres in such a way as to bring the free end of the sheet into abutment against a wall which is located beyond a cutting device which is adapted to cut the sheet to the desired length for the pile at a position above the inlet to a passage of rectangular section, having smooth inner walls, into which the rows of cut pile are introduced by a heel attached to a mobile blade of the cutting device, the outlet of said passage being such as to discharge the rows of cut pile perpendicularly onto a conveyor belt covered with an adhesive support and including a further belt disposed parallel to and above the first mentioned belt in such manner as to ensure the embedding of the pile into said support.

The invention will be further apparent from the following description, with reference to the accompanying schematic drawing, which shows, by way of example only, one embodiment of a machine for carrying out the method of the invention.

Of the drawing:

FIG. 1 is a longitudinal section of the machine; and
FIG. 2 is a part section similar to that of FIG. 1 showing a modified feed device.

Referring now to the drawing and more particularly FIG. 1 thereof, it will be seen that a sheet 2 of yarns or fibres, possibly finished, passes between feed rollers 3 and 4.

The fixed counter-blade 5 of a cutting device is disposed beyond the roller 4 and has its upper edge in a horizontal plane which is tangential to that part of the roller 4 in contact with the sheet 2.

The rollers 3 and 4 feed the sheet 2 intermittently in such a way that its front end 2a is carried into abutment with a vertical wall 6 located beyond the counter blade 5. The feed of the sheet 2 is such that the ends of these yarns or fibres are slightly bowed. The moving blade 7 of the cutting device is carried by a support 8 which is slidable vertically above the end of the sheet 2. The mobile blade 7 is provided with a push heel 9 whose width is such that the assembly of the blade 7 and push heel 9 can be introduced between the counter-blade 5 and the wall 6.

The space between the counter-blade 5 and the wall 6 is extended by a passage 11 of rectangular section. The height of this passage corresponds to the length of the pile 12 and its width to that of the sheet 2. The inner walls of the passage are absolutely smooth and the profile of the passage describes a quarter circle so that its outlet end is tangential to a horizontal conveyor belt 13 moving in the direction of the arrow 16. In front of the passage 11 a driving belt 15 whose lower branch moves in the direction of the arrow 16 is disposed above the belt 13.

The outer surface of this belt 15 is preferably of a rough character.

The belt 13 is loaded before reaching the passage 11 with a layer of adhesive material 17. The distance between the belt 13 and the lower branch of the belt 15 corresponds to the length of the pile 12. This distance is accurately adjusted by a pressure roller 18 applied to the lower branch of the belt 15.

The machine operates in the following manner:

The rollers 3 and 4 feed the sheet 2 forwardly by successive length each corresponding to the length of the pile 12. The free end 2a of the sheet 2 comes into abutment against the wall 6 and becomes slightly bowed, whilst the sheet 2 is moving forward. The support 8 is in the top position shown on the drawing. It is then brought into the bottom position in such a way that the end 2a of the sheet 2 is cut and the row of pile thus obtained is pushed by the blade 7 and the heel 9 between the counter-blade 5 and the wall 6. This entry of a new row of pile 12 causes the advance in the passage 11 of all the rows previously cut. Thus each time a new row of pile 12 is cut, a row previously cut is driven out of the passage 11 and deposited vertically on the belt 13. The upper end of the said row is then driven under the lower branch of the belt 15 which causes simultaneously with its forward movement in the direction of the arrow 16 the embedding thereof into the adhesive material 17.

If the speed of the belts 13 and 15 are the same, the pile 12 being carried along by both its ends at the same speed, remains verticals, i.e. perpendicular to the surface of the adhesive material 17. If, however, the speeds of the belts are different the pile 12 is laid at a slant dependent upon the speed difference.

The fact that, on its introduction, first between the counter-blade 5 and the wall 6 and then within the passage 11, the pile 12 is slightly bowed allows the pile during the whole of its passage to maintain a direction perpendicular to the upper and lower walls of the passage 11. The pile 12 embedded in the adhesive material 17 is then conveyed towards a drying device such as a tunnel shaped oven,

FIG. 2 shows a varied embodiment of the device feeding the sheet 2. This device includes three feed rollers 21, 22 and 23 for each of which a support surface 24, 25 and 26 respectively is provided. Each roller feeds a sheet of yarns of fibres of different colours 28, 29 and 31 respectively. It is thus possible to vary as desired the colour of successive rows of the pile 12.

It will be appreciated that it is not intended to limit the invention to the above examples only, many variations being possible, without departing from the scope thereof.

Thus for example, to limit the strain of cutting, particularly in very wide machines, the number of mobile blades may be increased, such blades working in turn or simultaneously.

What is claimed is:

1. A method for the manufacture of non-woven pile fabrics by embedding the said pile in a support or backing of a plastics material characterised in that it includes the steps of repeatedly pushing a sheet of yarn against a wall in such a way that each end of the pile is slightly bowed, and cutting the sheet at the desired length by a cutting device having a mobile blade and push heel which introduces the rows of cut pile thus obtained into a smooth passage which extends and has its outlet such that the rows of pile are introduced between a conveyor belt on which an adhesive support has been deposited and a driving belt which applies the rows to and embeds them in the adhesive support carried by the first mentioned belt.

2. A method as claimed in claim 1, and moving the two belts at equal speed thereby to produce a fabric having the pile perpendicular to the support.

3. A method as claimed in claim 1, and moving one belt at a speed different from that of the other belt,

thereby to produce a fabric having the pile disposed at an acute angle to the support in which it is embedded.

4. A machine for manufacturing nonwoven pile fabrics, comprising two superimposed feed rollers adapted to feed repeatedly a horizontal sheet of yarns or fibres in such a way as to bring the free end of the sheet into abutment against a wall, a cutting device which is adapted to cut the sheet to the desired length for the pile at a position above the inlet to a passage of rectangular section, having smooth inner walls, a heel attached to a mobile blade of the cutting device for introducing the rows of cut pile into said passage, the outlet of said passage being so positioned as to discharge the rows of cut pile perpendicularly onto a conveyor belt covered with an adhesive support, and a further belt disposed parallel to and above the first-mentioned belt in such a position as to press the pile into said support.

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HAROLD ANSHER, Primary Examiner

P. DIER, Assistant Examiner

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