Production of patterned fabrics.

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Description

This invention relates to the production of patterned fabrics and is concerned with the problems which arise as a result of the different usage rates of the yarns of different colours. These problems are associated with a wide variety of different production processes such as knitting, embroidery, lace-making, carpet making and so forth. The basic difficulty stems from the fact that at the end of a production run the quantity of yarn remaining in the creel will differ widely from colour to colour and in the majority of cases this residual yarn will represent a source of waste which cannot normally be avoided.

The operation of a gripper Axminster carpet loom provides a typical example of the problem referred to and the invention will therefore be described in terms of such a loom although it will be understood that the principles involved are also applicable to the other processes referred to above and indeed to any process involving different usage rate of different colours of yarn.

In a gripper Axminster carpet loom the tuft yarns are presented to the grippers by means of yarn carriers each of which carries a number of yarn ends corresponding to the number of different colours in the carpet, typically eight. Each yarn carrier is controlled by a Jacquard mechanism which brings each yarn carrier into the correct position to present to the respective gripper a yarn end of a selected colour in accordance with the pattern being woven. Since there has to be a yarn carrier for each tuft position across the width of the carpet, there are hundreds of such carriers for normal carpet widths and a total of thousands of ends of tuft yarns. Each individual tuft yarn is drawn from a package and the large number of packages involved are mounted in a creel.

The length of tuft yarn withdrawn from each package depends on the frequency with which the colour in question appears at the respective point in the width of the carpet in accordance with the pattern being woven. If, for example, there is a predominant background colour, relatively large quantities of the yarn of this particular colour will be withdrawn from the respective packages while colours which occur relatively infrequently at specific locations will cause the withdrawal of only very small quantities from the packages in question. When a standard pattern is being woven and a loom produces this pattern for days or weeks on end, tuft yarn packages will need to be replaced periodically and if tag-ending is used, this can be done without any interruption of the production. For the reasons already given, some packages will need to be replaced at frequent intervals while others will provide sufficient yarn for the whole of the production run. At the end of the run any unfinished packages can merely be returned to stock since if the colours are standard, they will be required again in due course.

The position is quite different, however, when carpet is being woven to the requirements of a specific contract. Such a contract may require both a non-standard pattern and non-standard yarn colours and will inevitably require a specific length of carpet. In order to provide non-standard colours, the tuft yarns have to be specially dyed for the job in question and it is necessary to make at least a rough assessment in advance as to the weight of each colour required. By analysing a single repeat of the pattern, it is possible to obtain a general indication of the weights of yarn of the different colours which will be required and to dye the different quantities of yarn accordingly.

For the reasons already explained, however, some packages of yarn in the creel will be completely used up and will have to be replaced, while others will be only partly used. Accordingly in order to allow for this it is necessary to dye appreciably more than the calculated weight of yarn for each colour and at the end of the run this excess will represent waste since it is most improbable that the same colour yarn is likely to be required in order to supply a subsequent contract order. From an economic point of view the cost of this waste yarn must be included in the price of the carpet and, as a consequence, any carpet which is specially woven to order is correspondingly more expensive.

In a method according to the invention of producing a patterned fabric on a textile machine the pattern is analysed to determine the length of yarn required to each position in the pattern in order to produce a predetermined length of fabric and the required lengths of yarn are supplied to the positions in a creel, corresponding to the respective positions in the pattern. This involves making a much more detailed analysis of a single repeat of the pattern than referred to above and instead of merely calculating the total weight of yarn of each colour required for that repeat, using the analysis to determine the quantity of yarn of each colour required for each individual tuft position across the width of the carpet, that is to say the quantity of each yarn colour which needs to be made available to each individual yarn carrier. This calculation having been made, a quantity of yarn equal to, or in practice very slightly in excess of the calculated amount of each colour of yarn, is placed at the appropriate point in the creel to supply the respective yarn carrier.

As a consequence, when the production run is complete, all that is left remaining in the creel is any deliberate excess which is provided over and above the calculated quantity for each yarn carrier.

While it is possible to provide exactly the calculated amount, this would lead to the risk that, owing perhaps to minor irregularities in the operation of the loom, one or more yarn ends might run out just before the end of the run and there would be no further yarn available of that particular colour. In other words, the slight excess is preferably provided in order to allow for minor irregularities either in operation of the loom or possibly in the calculation and this excess may be made as small as is found feasible in practice.
without involving any risk of any yarn end running out before the end of the production run. In this way it is possible to reduce any wastage to insignificant proportions and thus to reduce the cost of the carpet production accordingly.

Although it is possible in theory to carry out the required analysis for the quantity of yarn of each colour required for each yarn carrier, merely by visual inspection and calculation, this is extremely time consuming and is a job which is carried out much more efficiently under computer control. One particularly suitable form of computerised system which is capable of being used to carry out such analysis is the pattern design system manufactured by Sci-Tex Corporation Limited.

The system stores full details of a complete repeat of any required pattern in its memory and on this basis can make any required mathematical calculations based on that pattern. In particular, the system can calculate the total length of tuft yarn of each colour in each longitudinal row of the pattern, that is to say the total length of tuft yarn of each colour which needs to be made available to each yarn carrier, either for a single repeat or for the number of repeats required for any particular length of carpet. The results of the calculations may either be in the form of a print-out or in the form of an information store such as a punched tape or a magnetic tape or disc which can be used for the direct control of metering devices whereby the required quantity of yarn may be provided at each respective position in the creel. Prior to supplying the yarn to the different creel positions, the total quantity of yarn of each colour may be calculated and the required quantity of yarn dyed accordingly.

It is, of course, necessary to prepare a creel in advance in accordance with the particular pattern to be produced and this primarily involves supplying the correct lengths of yarn of the correct colours to the respective containers. This is preferably achieved by a method and apparatus in accordance with the co-pending Divisional application no: EP—A—154 355 which involves feeding each individual yarn between a pair of metering rollers followed by an air jet through which the yarn passes and which blows the yarn into the container and compacts it, the metering rollers being controlled to stop the feeding action when the required length of yarn has been supplied.

The invention will now be described in more detail, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a diagrammatic view of an Axminster carpet loom showing the general arrangement of the associated yarn supply creel;

Figure 2 is an elevation of apparatus for supplying yarn to groups of containers making up the creel of Figure 1;

Figure 3 is an end view of the apparatus of Figure 2 seen from the left in that Figure;

Figure 4 is a sectional view to an enlarged scale of the upper part of the apparatus in Figure 2;

Figure 5 is a sectional view also to an enlarged scale of the lower part of the apparatus seen in Figure 2;

Figure 6 is a view similar to Figure 5 but showing a later stage in the operation;

Figure 7 is a plan view of a gripper mechanism seen in elevation in Figures 5 and 6;

Figure 8 is a view from the left hand side of the lower part of the apparatus seen in Figures 5 and 6, but with bottom gates in an open position;

Figure 9 is a plan view to an enlarged scale seen along the line IX—IX in Figure 4;

Figure 10 is a vertical section seen along the line X—X in Figure 9;

Figure 11 is a vertical section seen along the line XI—XI in Figure 9;

Figure 12 is a sectional plan view on the line XII—XII in Figure 11;

Figure 13 is a view to an enlarged scale of indexing mechanism forming the lower part of Figure 2;

Figure 14 is an enlarged sectional view of the bottom left hand corner of Figure 13;

Figure 15 is a sectional view seen from the left hand side of Figure 14;

Figure 16 is a view to an enlarged scale of cross-indexing apparatus forming part, of the arrangement seen in Figure 13; and

Figure 17 is a plan view corresponding to Figure 16.

Turning first to Figure 1, a gripper Axminster carpet loom shown diagrammatically as 10 has a creel which, in accordance with normal practice is arranged in two levels, a floor level 11 and an upper level 12 mounted on a platform 13 extending above the loom. The tuft yarns held by the creel, instead of being wound in packages in the usual way, are held in vertical tubular containers arranged in rectangular groups each mounted in a wheeled trolley 15. The individual yarns extend upwardly from each trolley, being illustrated only in connection with the trolley identified specifically as 15A where they are indicated generally as 16. Each yarn passes upwardly into its own individual tube, groups of which extend downwardly to the loom 10 at 17. Similar tubes extend upwardly from above each trolley 15 as indicated diagrammatically at 18, and since there may be several rows of trolleys in the creel, very large numbers of tubes are involved. In a typical example, each trolley may include eighteen rows each of sixteen containers, giving a total of two hundred and eighty eight yarns per trolley. For a particular pattern of carpet, there may be as many as thirty two trolleys arranged in four rows of eight. When the creel is initially set up, the individual yarns have to be threaded along their respective tubes to the loom, but when the creel is periodically replenished, lengths of yarn can be left in the tubes 18 so that the leading ends of the fresh lengths of yarn merely need to be knotted to the trailing ends of the lengths of yarn remaining in the tubes so that they can be pulled through the tubes and pieced up in the loom. Each individual yarn container supplies yarn to
a respective point in the pattern to be woven and thus, in the case of a gripper Axminster loom, as illustrated, each individual yarn is supplied to a respective yarn carrier. As previously described, the length of yarn in each container is carefully controlled to correspond to that required for the respective position in the pattern and the remainder of the description is concerned with the apparatus used for supplying each container of a group mounted in a trolley with the appropriate length of yarn. Although the description of Figure 1 has been related specifically to a gripper Axminster carpet loom, it will be understood that similar principles apply to the production of other types of patterned fabric where individual yarn supplies are directed to respective points in the pattern. Although Figure 1 illustrates all the yarns as being held in containers, it is quite possible that at least a small proportion of the yarns, particularly where relatively large quantities are required, should be wound on packages in the usual way, but this is not illustrated in the drawings.

Turning now to the feeding of the calculated lengths of yarn of the different colours to the individual containers of a group, Figure 2 shows the general arrangement of apparatus for this purpose. As already mentioned, a typical arrangement of containers in a trolley 15 comprises eighteen rows, each of sixteen containers. As an indication of typical dimensions, each container may be 85 mm square and 1200 mm long with a wall thickness of 1.5 mm. Although it is possible to fill all sixteen containers in a row simultaneously, the apparatus seen in Figures 2 and 3 includes only eight filler heads, each indicated generally as 20 and only one of which is seen in Figure 2. As can be seen from Figure 3, the filler heads 20 are spaced so as to fill alternate containers 21 and in operation, a trolley 15 is indexed through the apparatus by means of mechanism to be described later so as to supply yarn to alternate containers in each of the eighteen rows (to quote the example referred to previously) and when this operation is complete, the trolley 15 is indexed laterally by a distance equal to the pitch of containers in the rows and the process is repeated so as to supply yarn to all the intervening containers.

The yarns supplied to the containers 21 are drawn from packages, one of which is seen at 25, mounted on a frame 26. The yarn shown as 27 passes through guides 28 and 29 and thence to a pair of metering rollers 30 and 31 seen in more detail in the enlarged view of Figure 4. The lower roller 30 is made of steel and is positively drawn while the roller 31 is rubber covered to avoid slip and is pressed against the roller 30 by an air cylinder 32 seen in Figure 2. The metering action is performed by the upper roller 31 which is controlled by a computer produced tape or other form of information store corresponding to the respective position in the pattern. When the required length of yarn has been delivered, the roller 31 is raised to stop the feed. If yarn is not required in any particular container, the respective roller 31 remains in the up position.

After passing between the rollers 30 and 31, the yarn 27 passes downwardly through an air injector jet indicated generally as 35 in Figure 4 and in more detail in Figure 10 which will be described later. The effect of the air jet is to maintain the downward movement of the yarn 27 and, more importantly, to supply compressed air to the interior of a first or upper container 40 to which the yarn is compacted by a compacting effect on the yarn as it accumulates towards the bottom of the container. There are, of course, as many upper containers 40 as there are filler heads 20, that is to say eight in the present example, as can be seen from Figure 3. The yarn accumulates in random fashion at the bottom of each container 40 and the compacting effect of the compressed air from the jet 35 is augmented by periodic pulses of higher pressure air. The pressure at the jet may be normally between twenty and thirty pounds per square inch (137—206 kN/m²) but this is increased to a pressure of eighty pounds per square inch (551 kN/m²) for example at intervals of about two seconds. This sudden increase in pressure has the effect of acting on the top of the packed yarn and compacting the body of the yarn beneath. Although not illustrated, the pulses of increased pressure may conveniently be obtained by charging an air reservoir at the increased pressure referred to and then abruptly discharging the air by way of a valve into the main airstream of the jet.

The amount of yarn fed into each upper container 40 is controlled individually as described above, but in general (with an exception to be mentioned later) does not fill the container above a point just below the ram 42 seen in Figure 4 which is formed with a central opening 43 for the passage of the yarn. The ram 42 is carried by four vertical rods 44 passing through seals 45 in the top 46 of the container 40, as seen in Figure 11 and described in more detail later. The upper ends of the rods 44 are fixed to a crosshead 50 which slides vertically on a guide rod 51 extending downwardly from a support 52 and controlled by an air motor 53.

The air motor 53 runs on a vertical guide 54 extending between supports 55 and 56. Although the type of air motor used is of no means critical, a suitable type of such motor is one available commercially under the name ROL-AIR MOTA sold by Kay Pneumatics Limited. This motor operates on a peristaltic principle which utilises a pair of nipping rollers indicated diagrammatically as 58 which co-operate with an air hose constituting the guide 54. Air pressure is supplied to the opposite ends of the hose by way of lines 59 and 60 connected to a reversing valve. When air is supplied to the bottom of the hose 54 the pressure acting beneath the nip of the rollers 58 drives the motor 53 upwardly and the application of air pressure to the top of the hose drives the motor 53 downwardly. When the filling of the
container is complete, the ram 42 is brought into action and driven downwardly by the motor 53 to compact the yarn against the bottom of the container 40.

As seen in Figures 5 and 6, the bottom of each upper container 40 is constituted by a pair of gates 61 each extending from a bush 62 turning about an axe 63, the angular position of which is controlled by a cam 54, the other end of which is connected to the piston rod 65 of an air cylinder 66. In the full line position of the gates 61, they resist the downward pressure exerted by the ram 42 so that the yarn is compacted as previously described. In the position shown in Figure 5, the ram 42 has just operated to force the compacted yarn into a container 21 and has returned to its uppermost position (not seen). The position of the ram illustrated in Figure 6 corresponds to the maximum compaction of the quantity of yarn which has been fed to the upper container 40 and at this point, the air cylinders 66 are operated to swing the gates 61 downwardly into the vertical positions shown in dotted lines as 61'. This allows the compacted body of yarn to pass downwardly into the container 21 which is of the same cross section as the container 40 and is in register with it as a result of indexing movement of the trolley 15 on which it is mounted.

The downward movement of the ram 42 then continues until all the compacted yarn has been forced into the container 21 except for a length of yarn which extends upwardly from the compacted mass, through the opening 43 into the ram 42 and back to the rollers 30 and 31. The ram 42 then returns upwardly to its initial position and the gates 61 return to the full-line, closed position of Figure 5 so as to clamp the length of yarn between them. The individual rams 42 operate independently of one another, their time of operation depending on the quantity of yarn to be transferred from an upper container 40 to a lower container 21. If no yarn at all is to be supplied to any particular container, the respective ram does not operate at all.

On the other hand, if any lower container 21 is required to accommodate a particularly large quantity of yarn, that is to say more than can be held by an upper container 40, a modified form of operation is necessary. As the yarn, compacted only by air pressure approaches the top of the container 40, the gates 61 are opened without interrupting the feed of yarn. The yarn already in the container 40 is thus allowed to drop into the corresponding lower container 21, the movement being assisted by the air pressure. Since each container 40 is considerably longer than the respective lower container 21, the plug of yarn spans the gap between the two containers and filling of the upper container 40 proceeds as previously. When the full required amount of yarn has been delivered to the upper container 40, the ram 42 returns to the same manner as previously described, compressing the complete body of yarn and forcing it all into the lower container 21. The ram 42 then returns and the gates 61 close, as previously described.

The opening of the gates 61 is controlled on a time basis, i.e. by means of a signal from an electrical timer rather than in response to a signal that the correct amount of yarn has been supplied to the upper container. In practice, this timing corresponds to a point when the container 40 is approximately two-thirds full. As mentioned previously, feeding of the yarn continues without interruption and the final operation of the ram 42 to compress all the yarn into the lower container 21 takes place in exactly the same manner as previously described. This modified mode of operation represents the exception referred to above in which the total quantity of yarn supplied is greater than that which would normally fill a container 40 without mechanical compaction.

When all the rams have returned to their initial positions, the apparatus is ready for the indexing of the trolley which is represented by movement to the left as seen in Figures 5 and 6. Before this movement occurs, the containers 40 are raised slightly, e.g. by 25 mm, to provide working clearance with the tops of the containers 21. This upward movement is produced by an air cylinder 70 connected to one arm of a bell crank 71 pivoted to the frame at 72 and the other arm of which is connected to the assembly of containers 40, as seen in Figure 2.

The method of breaking the length of yarn extending from the gates 61 will now be described in more detail, with reference to Figures 5 to 7. As soon as the gates 61 have closed to clamp the yarn, the length of yarn extending between the gates and the top of the container 21 and indicated as 70 is engaged by a gripper mechanism indicated generally as 71 and seen in plan view in Figure 7 in relation to the container 21. The mechanism includes a fixed jaw 72 and a movable jaw 73 controlled by an air cylinder 74. Both jaws are supported by an L-beam 75 seen in dotted lines in Figure 7, which extends along the gripper mechanisms of all the containers 40. This in its turn is carried by an arm 78 pivoted at 79 and operated by a further air cylinder (not shown) so as to move from the position of Figure 5 to that of Figure 6. As a first stage in the operation, the jaw 73 is moved to the closed position to grip the yarn 70 and the mechanism 71 is then moved to the position of Figure 6 so as to break the yarn 70 between the gripper and the point where it is held by the gates 61. At the same time, the trolley 15 and hence the container 21 is indexed to the left as already described. As a consequence, the yarn below the gripper jaws 72, 73 is held above the left hand side of the container 21 which, as a result of the indexing movement is no longer beneath the corresponding container 40, the next container in the sequence having moved into this position.

While the yarn 70 is held in this position a pusher member 82 mounted for vertical movement in guides (not shown) as indicated by the
double headed arrow in Figure 6 is controlled to move from an upper position shown in Figure 5 to a lower position shown in Figure 6 in which a forked end portion 83 engages the length of yarn 70 and presses it into a small notch in the top of the wall of the container 21. Each container has such a notch, as can be seen at 84 in Figures 5 and 6. This notch is sufficiently narrow to grip the yarn end and the pusher member 82 is then retracted to leave the yarn end held in position after which it is released by opening of the jaws 72, 73 of the gripper mechanism 71. Each filled container 21 in the trolley 15 is thus left with a projecting yarn end held in the notch 84 and these ends are thus readily available for joining to the yarn ends projecting from the tubes 18 of the creel, as previously described. After joining, it is a simple matter to pull each yarn through its tube for piecing up in the respective yarn carrier of the loom.

Figure 8 shows further details of the gates 61 in the open position indicated as 61° in Figure 5. As shown, the gates are perforated to allow free passage of air which is blown into each upper container 40 to compact the yarn against the gate 61 at the bottom of each container. The walls of the containers themselves are impervious and the air which flows downwardly through the compacted mass of yarn must therefore be able to escape freely through the gates 61.

Figures 9 to 12 show constructional details of the air jet 35 and the ram 42 at the upper end of each upper container 40. The injector air jet 35 includes a central passage 86 for the passage of yarn which broadens out at 87, air being supplied to this broader part by an inclined passage 88 leading from an annular space 89. Air is supplied to the space 89 by a line 90 provided with a screw connection 91. The flow of air down the passage 88 assists the movement of the yarn through the passage 86 and the resultant air pressure within the container 40 compacts the yarn at the bottom.

The ram 42, as seen from Figures 9 and 12 is square in shape to match the shape of the cross section of the container 40 and has an appreciable clearance from the wall of the container to avoid the risk of compacted yarn becoming jammed. The central opening 43, however, is circular to avoid any corners which might trap the yarn.

The remaining Figures illustrate the mechanism for indexing trolleys beneath the filling arrangement already described. As seen in Figures 1 and 2, each trolley is provided with a swivel castor 95 at each corner and remains supported on these castors during the successive stages of filling and indexing. For purposes of accurate location and indexing, each trolley is connected to an indexing frame 100 by means of a pair of pegs 101 which are moved upwardly to engage corresponding holes close to the forward corners of each trolley, best seen in Figure 13. Each peg 101 is mounted for vertical movement in a corresponding socket in structure 102 mounted beneath the frame 100 and is controlled for movement in its socket by connection to an arm 103 fixed to a shaft 104 which extends across the width of the indexing frame 100 to control both pegs 101. The shaft 104 is rocked between its two positions by means of an arm 105 which is itself operated by an air cylinder 106. Once the trolley has been coupled to the frame 100 by means of the pegs 101, it accurately follows the movement of the frame both from left to right as seen in Figure 2 and also in a direction at right angles to this.

The frame 100 is supported at each side by rollers 110 running between lower and upper rails 111 and 112 fixed to the main frame of the apparatus. The frame is indexed from left to right as seen in Figures 2 and 13 by means of a drive chain 114 passing around sprockets 115 and 116. The sprockets 116 on each side are driven in steps by a chain drive 117 by means of an electric motor 118 operating through a clutch/brake unit 119 and a speed reducing gear box 120 to produce the necessary indexing motion from left to right. To ensure accurate indexing, the position of the trolley 15 in relation to the frame 100 is constantly monitored by a detector arm 140 which is pivoted to the frame 100 and biased against the front of the trolley. The upper end of the arm 140 carries a micro-switch 141 which controls the clutch/brake 119 and co-operates with a bar 142 formed with spaced projections 143. The pitch of the projections 143 is equal to the required indexing distance and each time the plunger of the micro-switch engages a projection 143, indexing movement is interrupted.

The first step of movement brings the first row of containers 21 in the trolley 15 into register beneath the filling containers 40 and each successive step of indexing brings the next row of containers 21 into this position. As described above, each step of indexing is associated with breakage of the yarns from the filled containers so that, after the last row of containers has been filled, one further step of indexing is required in order to break the yarns from the last row of containers.

As described previously, only alternate containers in a row are filled as a result of a single operation so that, after the trolley has completed one sequence of indexing, i.e. to fill alternate containers in all the rows, a second sequence is necessary in order to fill the intervening containers. The trolley is accordingly indexed in the reverse direction to bring it back to its starting position, and is then cross-indexed by a distance equal to the pitch of the containers in the rows so that the intervening, unfilled containers are brought into register beneath the upper filling containers 40.

The cross indexing mechanism is illustrated in Figures 16 and 17. As seen from Figure 16, the structure 102 defining the socket for reception of each peg 101 is mounted for horizontal sliding motion on a bar 121 extending between pairs of brackets 122 extending downwardly from the frame 100. The members 102 are inter-connected for this sliding movement by a bar 124 which slides through the brackets 122 and has a project-
ing portion 125 to which is pivoted a connecting rod 126 driven by an eccentric 127. The eccentric 127 forms part of a gear wheel 128 meshing with a smaller pinion 129 which, in its turn, is driven by an electric motor 130 by way of a clutch/brake unit 131 and a speed reducing gear box 132. An angular displacement of the eccentric 127 through approximately one quarter of a revolution in an anti-clockwise direction moves the connecting rod 126 to the position shown in dotted lines as 126', thus moving the bar 124 a corresponding distance to the right. This moves the parts 102 also to the right to the position shown in dotted lines at 102' and hence indexes the trolley as a whole by a corresponding distance to the right on its swivel castors 95. The filling sequence is then repeated to fill all the remaining containers and to break all the yarns, after which the trolley is again reverse-indexed and finally removed from the machine in readiness for transfer to the creel.

Claims

1. A method of producing a patterned fabric on a textile machine in which the pattern is analysed to determine the length of yarn required for each position in the pattern in order to produce a predetermined length of fabric and the required lengths of yarn are supplied to the positions in a creel, corresponding to the respective positions in the pattern.

2. A method according to claim 1 in which the pattern is stored in a computer, to provide information as to the length of yarn required for each position in the pattern and this information is used to control metering devices for supplying yarn to each position in the creel.

3. A method according to claim 2 in which, for at least most of the positions in the creel, the metering devices supply the yarn to containers from which the yarn may subsequently be withdrawn during the production of the fabric.

4. A method according to any one of the preceding claims in which the fabric is pile fabric and the creel holds the yarns for forming the pile.

Patentansprüche


4. Verfahren nach irgendeinem der vorstehenden Ansprüche, bei dem das Gewebe ein Tuchgewebe ist, und das Rahmengestell die Garnne zur Bildung des Tuches hält.

Revendications

1. Procédé de production d'une matière textile à motif sur une machine textile, caractérisé en ce que l'on analyse le motif pour déterminer la longueur de fil requise pour chaque position dans le motif afin de produire une longueur de matière textile préalablement déterminée et en ce que les longueurs de fil requises sont amenées jusqu'aux positions dans un râtelier, correspondant aux positions respectives dans le motif.

2. Procédé suivant la revendication 1, caractérisé en ce que le motif est mémorisé dans un ordinateur, pour donner l'information relative à la longueur de fil requise pour chaque position dans le motif et en ce que l'on utilise cette information pour commander des dispositifs de mesure utilisés pour amener le fil dans chacune des positions dans le râtelier.

3. Procédé suivant la revendication 2, caractérisé en ce que pour au moins la plupart des positions dans le râtelier, les dispositifs de mesure amènent le fil dans des récipients d'où le fil peut ensuite être extrait au cours de la production de la matière textile.

4. Procédé suivant l'une quelconque des revendications précédentes, caractérisé en ce que la matière textile est du tissu à poils et en ce que le râtelier maintient les fils pour former le poil.