

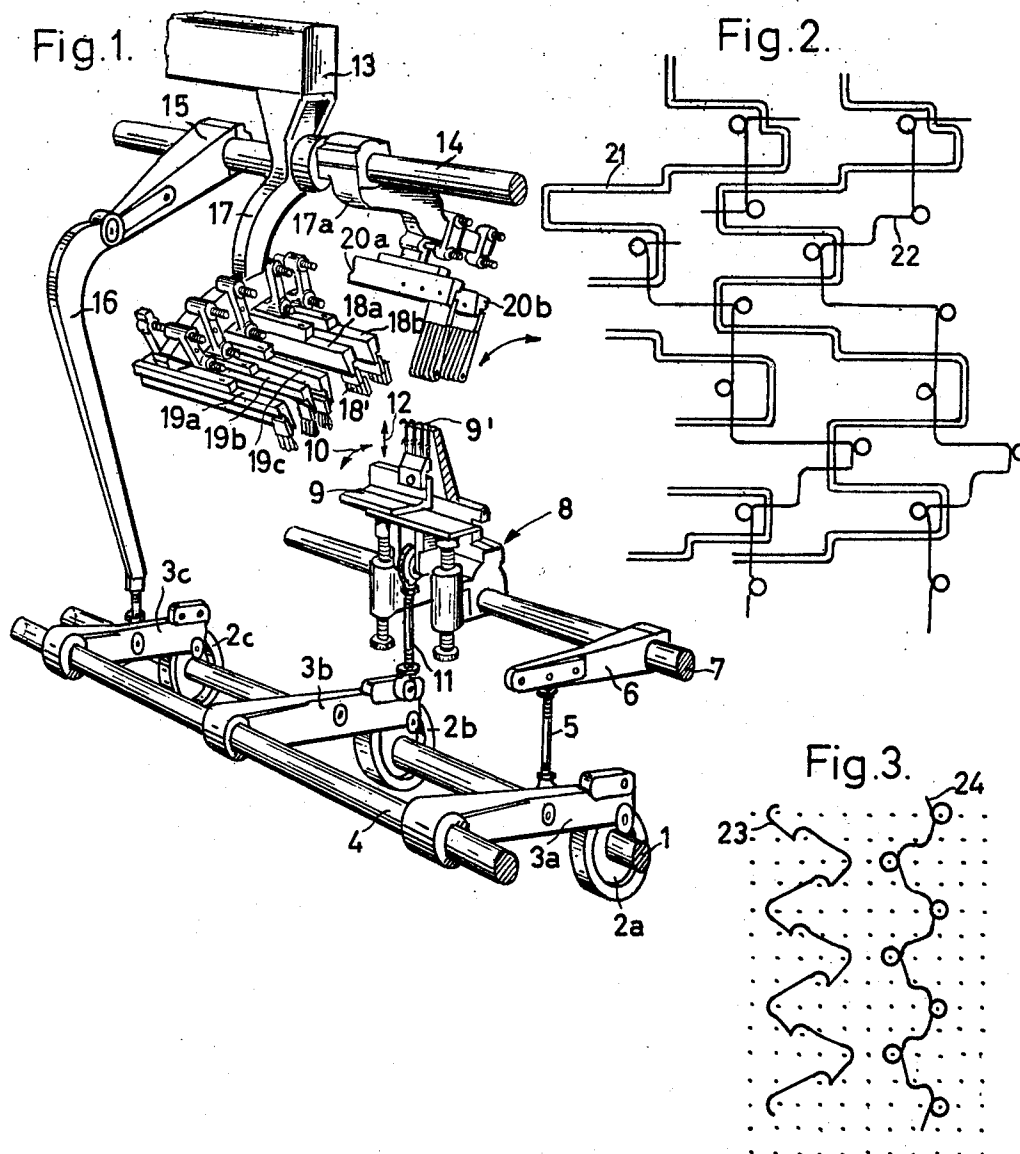
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METHOD AND APPARATUS FOR MAKING KNITTED IMITATION FUR

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**METHOD AND APPARATUS FOR MAKING
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ABSTRACT OF THE DISCLOSURE

A fabric having a fur-like appearance is knitted on a Raschel knitting machine having a swinging single needle bed, a yarn guide assembly secured against swinging movement and including guide bars for making a ground fabric and at least one guide bar equipped with chenille yarn guides, and at least one other guide bar which swings in front of the chenille yarn guide bar. Chenille yarns are laid in coursewise on the ground fabric and overlaps of the yarns from the swinging other yarn guide secure the chenille yarns to the ground fabric.

BACKGROUND OF THE INVENTION

This invention relates to fabrics having a fur-like appearance, and particularly to a method and Raschel knitting apparatus for making knitted imitation fur.

It is known to imitate Persian lamb fur by adhesively securing chenille yarns in a random pattern on a ground fabric. The chenille yarn cannot be secured firmly enough to the ground fabric unless relatively long sections of the yarn are directly superimposed on the fabric. The product, therefore, is rather flat and does not have the loose texture characteristic of fur. The adhesives employed have limited resistance to the chlorinated hydrocarbons commonly employed by dry cleaners, and the useful life of the afore-described imitation furs is relatively short.

The operations involved in securing the chenille yarns to the ground fabric are rather complex and slow and, therefore, costly.

The primary object of this invention is the provision of fabric having a fur-like appearance, which is capable of being produced at lower cost than the afore-described known material, yet is more pleasing in its appearance and more durable.

SUMMARY OF THE INVENTION

The invention, in one of its aspects, resides in a modified Raschel knitting machine equipped with an elongated needle bar and a multiplicity of guide bars mounted on a support, as is basically known. The latch needles on the needle bar have backwardly directed hooks and cooperate with a yarn guide assembly of the afore-mentioned guide bars, which includes two ground fabric yarn guide bars and a chenille yarn guide bar carrying chenille yarn guides. A first actuating mechanism moves the needle bar and the yarn guide assembly relative to each other in a backward-and-forward direction.

Another one of the afore-mentioned guide bars is forwardly offset from the chenille yarn guide bar, and a second actuating mechanism causes relative backward-and-forward movement of the last-mentioned guide bar and of the above-mentioned yarn guide assembly. A common drive mechanism is connected to the actuating mechanisms in such a manner as to operate the same in timed sequence.

The apparatus outlined above may be used for knitting a ground fabric from a first group of yarns, laying in chenille yarns in a coursewise direction on the ground fabric, and making overlaps of a second group of yarns on

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the chenille yarns and the ground fabric for securing the chenille yarns to the ground fabric.

Additional features, further objects and many of the attendant advantages of this invention will readily be appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the attached drawing.

BRIEF DESCRIPTION OF THE DRAWING

10 In the drawing:

FIG. 1 shows the knitting implements of a Raschel knitting machine together with a portion of the drive and actuating mechanism in a perspective view;

15 FIG. 2 is a point paper diagram illustrating the yarn guide movements in knitting a ground fabric according to the method of the invention; and

20 FIG. 3 diagrammatically illustrates the corresponding laying-in movements of chenille yarn guides and of other yarn guides which fasten the chenille yarns to the ground fabric of FIG. 2.

**DESCRIPTION OF THE PREFERRED
EMBODIMENT**

25 Referring now to the drawing in detail, and initially to FIG. 1, there is shown as much of an otherwise conventional Raschel knitting machine as is needed for an understanding of this invention.

The main cam or drive shaft 1 of the machine which rotates continuously during knitting carries three cams 2a, 2b, 2c and as many non-illustrated functional and structural duplicates of these cams and of associated motion transmitting trains as the width of the machine requires. The cams are engaged by arms 3a, 3b, 3c which are fulcrumed on a stationary bar 4 parallel to the shaft 1.

35 A push rod 5 hingedly connects the arm 3a with an arm 6 on a shaft 7 journaled in the machine frame in a manner not illustrated. A bracket 8 fixedly mounted on the shaft 7 guides a needle bar 9 with latch needles 9', only a fraction of the needle bar and of the associated needles being shown, and the hooks of the needles facing backward. When the push rod 5 moves up and down with the arm 3a, the bracket 8 oscillates forward and backward together with the needle bar 9, as indicated by the double arrow 10.

40 A push rod 11 hingedly connects the arms 3b with the needle bar 9 and moves the bar 9 and the latch needles 9' up and down on the bracket 8, as indicated by the double arrow 12, when the cam shaft 1 rotates.

45 A horizontal bar 13 of the supporting machine frame, not otherwise illustrated, carries a depending arm 17 provided with a bearing for a guide bar rocking shaft 14. A radial guide bar swing lever 15 on the shaft 14 is hingedly linked with the arm 3c by a connecting rod 16.

50 The arm 17 carries a yarn guide assembly including three guide bars 19a, 19b, 19c which are equipped with conventional yarn guides and are moved endwise on the arm 17 in a conventional manner by a pattern mechanism including a drum and chains, not illustrated. The arm 17 also carries two longitudinally movable guide bars 18a, 18b in front of the bars 19a-19c. The guide bars 18a, 18b are equipped with tubular chenille yarn guides 18' known in themselves.

55 A bracket 17a fixedly attached to the rocking shaft 14 carries two other guide bars 20a, 20b which swing forward and backward with the shaft 14 relative to the assembly on the arm 17 during rotation of the cam shaft 1, as indicated by a double arrow and are moved endwise by the non-illustrated patterning mechanism of the machine.

60 During operation of the illustrated knitting machine, there is a first relative forward-and-backward movement

there is a first relative forward-and-backward movement of the guide bars 18a, 18b, 19a, 19b, 19c and the needle bar 9 and a second relative forward-and-backward movement of the guide bars 18a, 18b, 19a, 19b, 19c, and of the guide bars 20a, 20b. Because of the shogging movements of the guide bars, there may additionally be lateral movement of all guide bars relative to the needle bar 9.

The knitting of imitation fur on the illustrated machine is illustrated in FIGS. 2 and 3 which are based on the assumption that only one of the guides 18a, 18b is threaded with chenille yarn 21, and only one of the swinging yarn guides 20a, 20b is threaded with a yarn 22 (FIG. 2). The ground structure is knitted from yarns 23, 24 threaded in to two of the yarn guides 19a, 19b, 19c (FIG. 3).

The chenille yarns 21 perform laying-in movements in front of the latch needles 9' while the yarns 22 threaded into one of the swinging yarn guides 20a, 20b make overlaps in front of the chenille guides and fix the chenille yarns to the ground fabric.

The chenille yarns, while firmly anchored in the fabric, are held only in relatively widely spaced points so that they closely duplicate the loose appearance of hair on natural fur. The knitted fabric can be cleaned in conventional dry-cleaner's fluid without suffering the deterioration common with conventional fur imitation materials which rely on adhesives for securing chenille threads to a fabric base.

While only four guide bars were threaded in the foregoing example, it will be understood that both guide bars 18a, 18b may be threaded with chenille yarns, and that the chenille yarn or yarns may be fastened to the ground structure by yarns laid-in by more than one of the swinging guide bars 20a, 20b. The ground fabric may also be modified in an obvious manner.

While the illustrated actuating and drive mechanisms for the several guide bars and the needle bar are preferred at this time, it is possible, of course, to use a needle bar secured against forward-and-backward movement and capable only of vertical reciprocating movement, to mount the yarn guide assembly of the guide bars 18a, 18b, 19a, 19b, 19c on the rocker shaft 14, pivotally to arrange the arm 17a on the rocker shaft 14, and to swing the arm 17a relative to the yarn guide assembly by a motion transmitting train interposed between the arm and the drive shaft 1 in a manner obvious from FIG. 1.

It should be understood, therefore, that the foregoing disclosure relates only to a preferred embodiment of the invention, and that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purpose of the disclosure that do not constitute departures from the spirit and scope of the invention set forth in the appended claims.

What is claimed is:

1. In a method of knitting a fur-like fabric on a Raschel knitting machine having a row of latch needles with backwardly directed hooks, four rows of yarn guides threaded with corresponding yarns, and actuating mechanism for causing relative forward and backward motion of the needles and of the yarn guides, and shogging motion of the yarn guides, two rows of said yarn guides moving back and forth through said row of needles while knitting a ground fabric on said needles from the yarns on the yarn guides of said two rows, the improvement which comprises:

(a) making underlaps only with the yarn guides of a third row, the yarn guides of said third row being threaded with chenille yarn and held in front of

said needles during said knitting of the ground fabric; and

(b) moving the yarn guides of the fourth row of yarn guides back and forth relative to the other three rows of yarn guides and said needles to make overlaps of the yarn threaded through said fourth row of yarn guides, for thereby securing said chenille yarn to said ground fabric.

2. A Raschel knitting machine comprising, in combination:

(a) a support;

(b) an elongated needle bar mounted on said support;

(c) a row of latch needles on said needle bar, said needles having backwardly directed hooks;

(d) two guide bars mounted on said support and carrying respective rows of ground fabric yarn guides;

(e) a third guide bar carrying chenille yarn guides and mounted on said support in front of said two guide bars, said two guide bars and said third guide bar jointly constituting a guide bar assembly;

(f) first actuating means for moving said needle bar and said guide bar assembly relative to each other in a backward-and-forward direction transverse of the direction of elongation of said needle bar and for thereby moving said ground fabric yarn guides back-and-forth through said row of latch needles while keeping said chenille yarn guides in front of said latch needles;

(g) a fourth guide bar carrying an associated row of yarn guides;

(h) second actuating means for moving said fourth guide bar backward-and-forward relative to said guide bar assembly and said needle bed and for thereby moving the yarn guides associated with said fourth guide bar back and forth between a position in front of said chenille yarn guides and a position in the back of said latch needles; and

(i) joint drive means for operating said first and second actuating means in timed sequence.

3. A machine as set forth in claim 2, further comprising means securing said yarn guide assembly on said support against movement in said backward-and-forward direction.

4. A machine as set forth in claim 2, wherein said chenille yarn guides are tubular and said chenille yarn guide bar is forwardly offset from said ground fabric yarn guide bars.

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