April 14, 1942. H. FLEISHER 2,279,919

KNITTED PILE FABRIC

Filed May 23, 1941 2 Sheets-Sheet 1

Fig. 1.

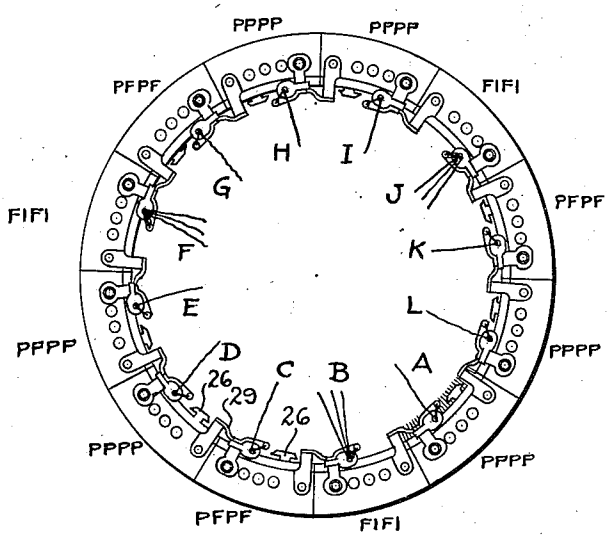


Fig. 5.

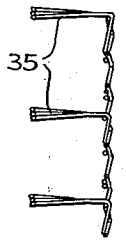


Fig. 2.

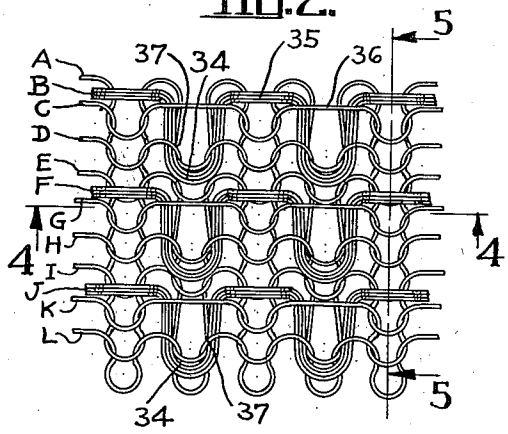


Fig. 3.

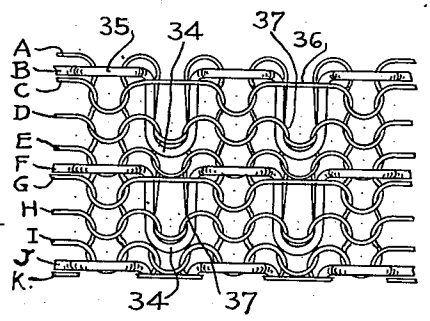
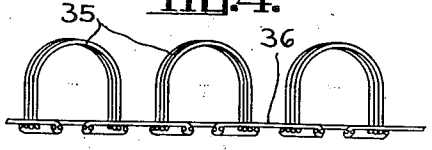


Fig. 4.



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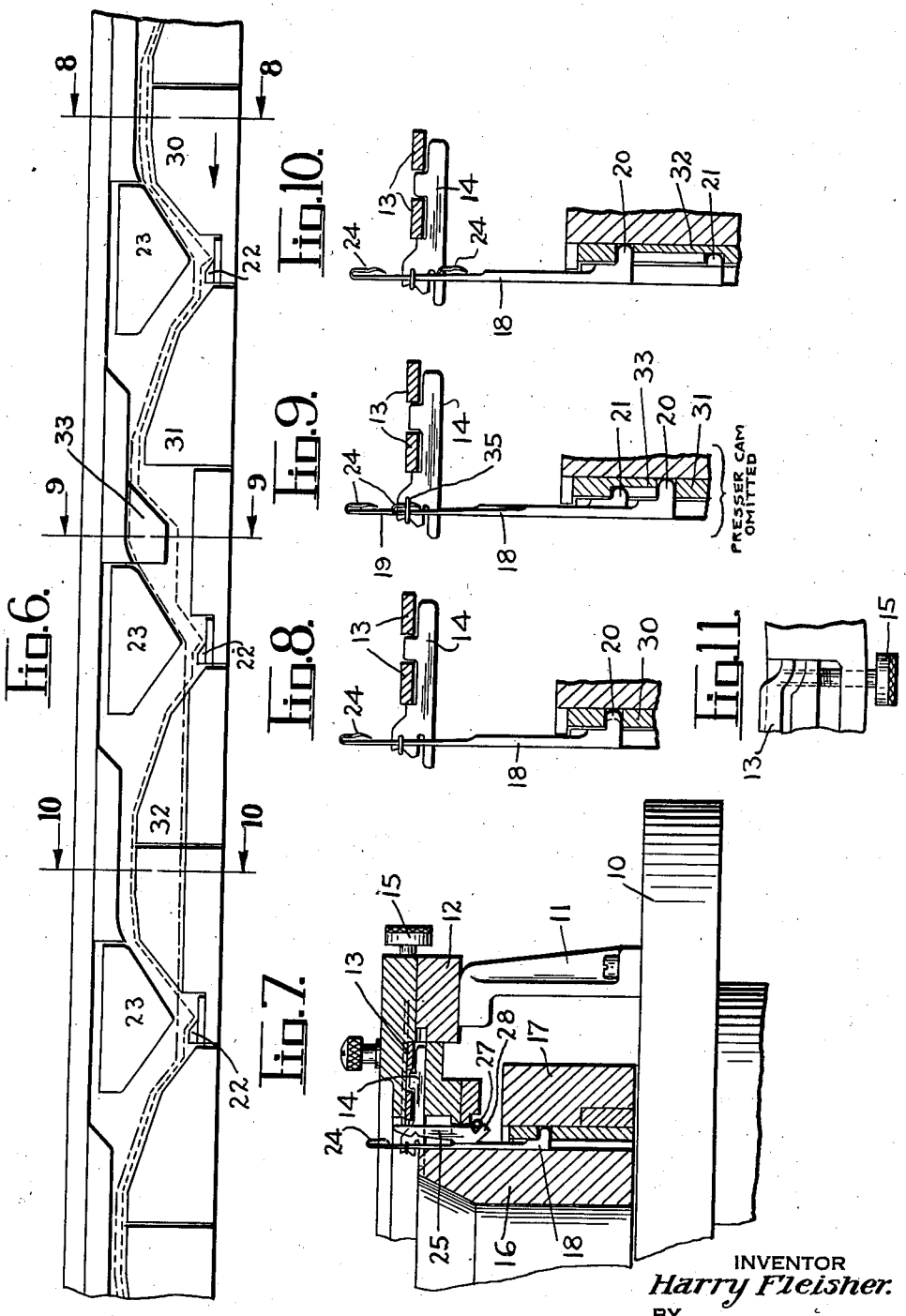


Fig. 6.

Fig. 10.

Fig. 9.

Fig. 8.

Fig. 11.

Fig. 7.

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2,279,919

KNITTED PILE FABRIC

Harry Fleisher, Watertown, Conn., assignor to Princeton Knitting Mills, Inc., Watertown, Conn., a corporation of Connecticut

Application May 23, 1941, Serial No. 394,779

4 Claims. (Cl. 66—191)

This invention relates to knitted fabrics, and more particularly to a fabric having floated and inlaid loops combined with plain stitches so arranged that the fabric is substantially run-resisting.

One object of the present invention is to provide a knitted inlaid fabric of the above nature having a novel sequence of stitches, floats, and inlaid pile loops, whereby the resultant fabric may readily be napped to produce a thick woolly appearance.

A further object of this invention is to provide a knitted pile fabric of the above nature and means to produce the same, which will be relatively simple in construction, easy to manufacture, flexible, relatively nonelastic, non-crushable, substantially run-resisting, and very durable and efficient in use.

With these and other objects in view, there have been illustrated by the accompanying drawings two forms in which the invention may be conveniently embodied in practice.

In the drawings:

Figure 1 represents a diagrammatic plan view of a circular "twelve station" knitting machine for producing the improved knitted floated and inlaid fabric of this invention.

Figure 2 is an enlarged view of the front surface of one form of knitted pile fabric embodying the features and principles of this invention, in which three yarns are fed to the stations where the inlaying occurs.

Figure 3 is a view similar to Figure 2 but showing another form of knitted pile fabric embodying the features and principles of this invention, in which a single enlarged yarn is fed to the inlay stations.

Figure 4 is a sectional view, taken on the line 4—4 of Figure 2, looking at one course of the fabric.

Figure 5 is a sectional view, taken on the line 5—5 of Figure 2, looking at one wale of the fabric.

Figure 6 is a development view of a portion of the stationary needle actuating cylinder cam.

Figure 7 is an enlarged vertical sectional view taken through the rotating needle carrying cylinder and the cam mechanism for actuating the needles and sinkers.

Figures 8, 9, and 10 are sectional views illustrating the three different arrangements of the long and short butt needles taken through the lines 8—8, 9—9, and 10—10, respectively of Figure 6.

Figure 11 is an underside view of the sinker-actuating cam.

The inlaid knitted fabric of the present invention is made on an ordinary twelve feed Wildman machine in which the various cams and other parts of the machine have been arranged in a novel manner.

Referring now to the drawings wherein like reference numerals designate like parts throughout the several views, the numeral 10 (Figure 7), indicates a circular stationary base, or table, upon which a plurality of upstanding brackets 11 are mounted. The brackets 11 serve to support a stationary ring member 12, which carries a plurality of segmental cam plates 13 adapted to actuate a series of sinkers 14. The sinker or cam plates 13 are adapted to be adjusted radially of the ring member 12 in the usual manner by means of a thumb-screw 15 which may be turned to vary the length of the loop or stitch measured off from the yarn.

Mounted on the base 10 are a continuously rotating needle carrying cylinder 16, and a stationary annular needle-actuating cam 17 (see Figure 7), the latter being rigidly secured to the table 10 and located below the ring member 12. The needle carrying cylinder 16 carries the usual series of alternating long and short butt needles 18 and 19 having long butts 20 and short butts 21 respectively, which are adapted to be engaged successively by lower and upper cam plates 22 and 23, respectively, forming part of the needle cam to alternately move said needles up and down in the usual manner. In Figure 6, the dotted line represents the movements of the long butt needles 18, while the dot and dash line indicates the movements of the short butt needles 19. Each of the needles 18 and 19 is provided at its top with the usual form of normally open spring beard 24 which is adapted to catch the yarn on the downward stroke of the needle, and when closed by the pressers 25, to cast off a stitch in the usual manner.

Operating between the successive needles 18 and 19, and cooperating therewith, are the sinkers 14 which are arranged to reciprocate horizontally under the control of the sinker cams 13, the length of the stitches being determined by the adjustment of the thumb-screw 15.

The pressers 25 are arranged in vertical position, one opposite each needle, and said pressers are adapted to close the beards 24 of the needles 18 and 19, and produce plain stitches when engaged by presser cams 26 which are located at stations A, C, D, E, G, H, I, K, and L. The presser cams are omitted at stations B, F, and J, for a purpose to be described later. In order to hold the beard pressers 25 normally away from the

needles 18, 19 at other times, provision is made of an endless coiled spring 27 which is seated in the lower notched ends 28 of the pressers 25. To line up the pressers 25 just in advance of each of the knitting points, a series of cams 29 are provided, one at each station.

The stationary needle cam 17 includes a plurality of sets of needle actuating cam members 30, 31, and 32, which cooperate with the upper and lower cam plates 22 and 23 (see Figure 6), to raise and lower the long and short butt needles 18 and 19, according to the novel sequence of the novel fabric. The three sets of needle actuating cam members 30, 31, and 32 are each different—the set 30 being used at courses A, D, E, H, I, and L, to produce plain stitches at every wale, the set 31 being used at courses B, F, and J, to produce alternating floats 35 and inlays 34, and the set 32 being used to produce alternating floats and plain stitches at courses C, G, and K. The cam members 30 are the regular form of cams used for plain knitting, and as indicated in Figures 6 and 8, both the long and short butt needles 18 and 19 are alternately raised and lowered—stitches being cast off at every wale in the usual manner. The cam members 31 differ from the cam members 30 by including a special cut-away plate 33, which is adapted to act on the long butt needle 18 to raise it only part way, as shown in Figure 9, so that the yarns fed at this course will be looped over the beard 24 of said needle 18 by its cooperating sinker 14, while the short butt needle 19 is in full raised position. The cam members 32 differ from the sets 30 in that the short butt needles 19, as shown in Figure 10, remain down out of action while the long butt needles 18 are up and in knitting position, thus producing alternating floats 36 and plain stitches at courses C, G, and K.

At the stations B, F, and J where the special cam members 33 are provided, the omission of the presser cams 26 produces a course of alternating pile floats 35 and loose inlays 34.

In the fabric shown in Figure 2, one yarn is fed at each of the stations A, C, D, E, G, H, I, K, and L, while three yarns are fed at the remaining stations B, F, and J, where the floats and inlays are produced.

The fabric shown in Figure 3 is identical with that of Figure 2, except that instead of feeding three yarns at stations B, F, and J, a single enlarged yarn is supplied at said stations. In both cases, the inlaid yarns 34 will be firmly tied into the fabric as indicated at 37, i. e., the yarn from the courses D, H, and L, serving to hold the inlaid loops 34 formed at the courses B, F, and J, respectively. The above described sequence is repeated at each succeeding set of four feeds, or courses, as long as the machine is operated.

As all of the floats 35, inlays 34, and floats 36 are disposed upon the same, or outer surface of the fabric, the back surface thereof will be relatively smooth. The front surface of the fabric containing such floats and inlay loops or piles, will then be subjected to the action of a napping machine whereby the fibres of the yarn will be spread apart and raised to produce a surface having woolly characteristics.

The layout of the fabric of Figure 2, which repeats every four courses and four wales, is indicated by the following table where P represents a plain knitted stitch, F a float 36, I an elongated inlay loop 34 produced by omission of presser cams, and PF a pile float 35 caused by partly raising the lower needle to bring its beard into line with a sinker and cause more yarn to be measured off:

Feeds	No. of yarns	Wale number			
		1	2	3	4
A, E, I	1	P	P	P	P
B, F, J	3	PF	I	PF	I
		PF	I	PF	I
		PF	I	PF	I
C, G, K	1	P	F	P	F
D, H, L	1	P	P	P	P

Similarly the fabric layout of Figure 3 is as follows:

Feeds	No. of yarns	Wale number			
		1	2	3	4
A, E, I	1	P	P	P	P
B, F, J	1 large	PF	I	PF	I
C, G, K	1	P	F	P	F
D, H, L	1	P	P	P	P

While there has been disclosed in this specification two forms in which the invention may be embodied, it is to be understood that these forms are shown for the purpose of illustration only, and that the invention is not to be limited to the specific disclosures, but may be modified and embodied in various other forms without departing from its spirit. In short, the invention includes all the modifications and embodiments coming within the scope of the appended claims.

Having thus fully described the invention, what is claimed as new and for which it is desired to secure Letters Patent, is:

1. A knitted pile fabric consisting of a repeating series of courses, each series consisting of at least one course having floated pile loops at every odd numbered wale and inlaid loops at every even numbered wale, one course having floats at every even numbered wale and plain stitches at odd wales, and a course of plain stitches.

2. A knitted pile fabric consisting of a repeating series of courses, each series consisting of at least one course having pile floats at every odd wale and inlaid loops at every even wale, one course having floats at every even wale and plain stitches at every odd wale, and two courses of plain stitches, one of the two last courses having a plain stitch at each even numbered wale tying in the inlaid loop of the first mentioned course.

3. A knitted pile fabric layout repeating every four courses and four wales, each series of courses comprising at least two courses having plain stitches at each wale, a course having pile floats at every odd numbered wale and an inlay at every even numbered wale, and a fourth course having plain stitches at every odd numbered wale and floats at every even numbered wale.

4. In a knitted pile fabric layout repeating every four courses and four wales, the first and fourth series of courses consisting of plain stitches at every wale, the second course having elongated pile floats at every odd numbered wale and an inlay loop at every even numbered wale, and the third course having floats at every even numbered wale and plain stitches at every odd numbered wale, the plain stitch at every even numbered wale of said fourth course tying the inlay loop of the second course into the fabric.

HARRY FLEISHER.