July 3, 1945. M. NEBEL 2,379,852

PRODUCTION OF LOOP-PLUSH FABRIC

Filed May 9, 1939

Fig.1

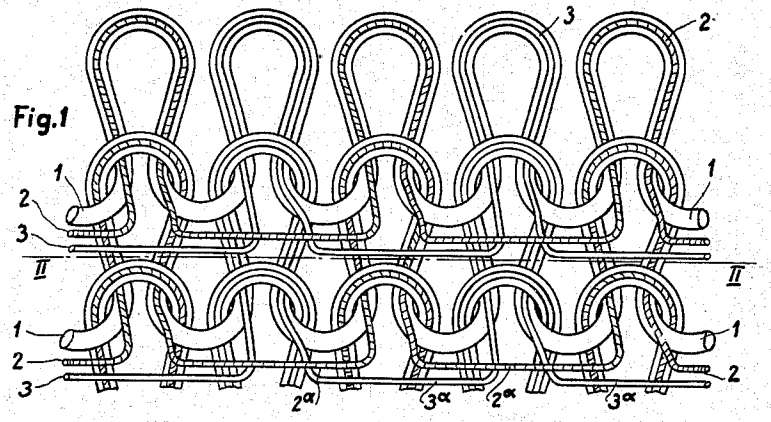


Fig.2

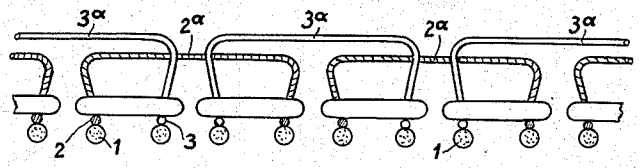


Fig.3

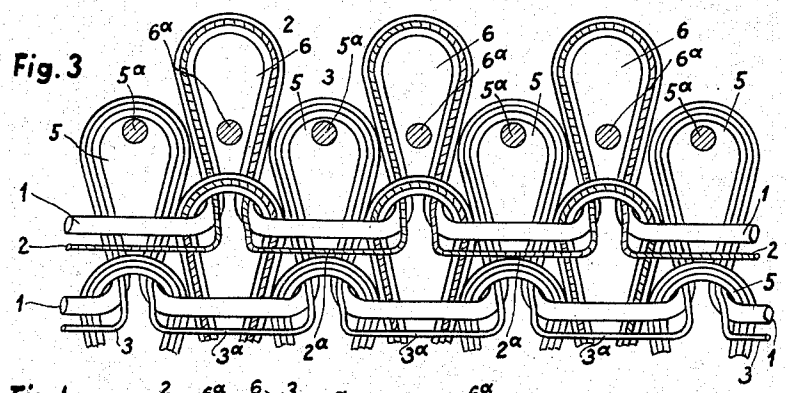
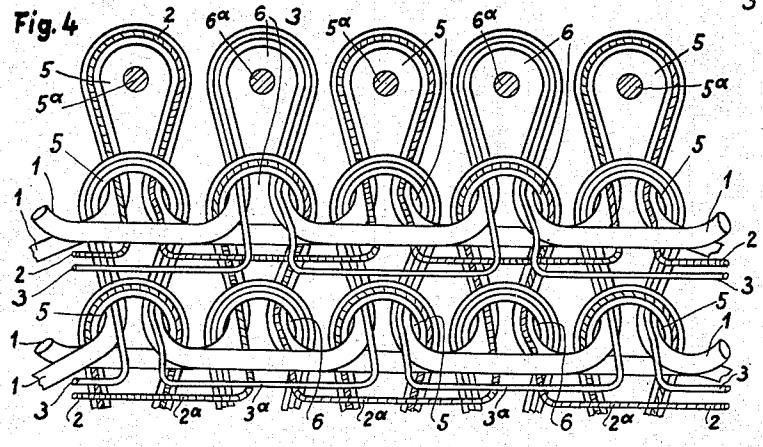


Fig.4



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PRODUCTION OF LOOP-PLUSH FABRIC

Max Nebel, Chemnitz, Germany; vested in the Alien Property Custodian

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8 Claims. (Cl. 66—194)

This invention relates to knitted loop-plush fabric.

In the known kinds of loop-plush fabric the plush loops forming the velvetlike pile are those sinker loops that are made longer than the ground fabric sinker loops from a second thread otherwise worked together with the ground fabric. In loop-plush fabric of this known type plush loops may be knit into every sinker loop or provided only above some of them, for instance every other sinker loop.

These kinds of loop-plush fabric are, however, open to the objection that in the direction of the wales between the sinker wales worked with plush loops spaces appear which are more or less conspicuous, depending on the greater or lesser thickness of the plush thread relative to the ground thread. As there are certain limits to thread thickness in all knitting machines, the plush thread cannot be made so much thicker than the ground thread to eliminate these open spaces, apart from the fact that the needle mesh in the ground fabric would acquire thereby an undesirable thickness. Furthermore, these open spaces are found also to a less conspicuous degree in the direction of the courses, since the plush loops in each course emerge exactly side by side from the face of the goods at the base of the sinker loops.

It is the object of my invention to overcome these drawbacks of the known loop-plush fabric by tying the plush thread into the basic fabric formed by working in each course two plush threads and two ground threads in such manner that each of the two plush threads is alternately worked with a needle mesh of one of the two ground threads to form a needle mesh. In each course the plush loops are therefore alternately formed of one of the two plush threads and each plush loop has twice the width of the sinker loop so as to extend from one limb of the ground fabric sinker loop to the other limb of the adjacent ground fabric sinker loop across the interposed needle mesh and thus to cross or overlap the adjacent plush loops.

The invention relates to the method of producing this new loop-plush fabric whose essential feature is that of two plush threads sunk longer than the ground thread in a course one thread is knit with the ground thread into a mesh by every other needle and the other thread by the interposed needles. Since according to the invention the plush loops are made so as to correspond in width to a double needle division, it becomes possible to eliminate the drawbacks which appear particularly in the knitting of the known loop-plush fabric having plush loops provided above every sinker loop and which are due to the fact that the plush thread is drawn out much longer than the ground thread and must therefore stand much higher tensions and speeds than the ground thread.

According to the invention, each of the two plush threads of a course is worked only at every second needle into plush loops with the result that the stressing of the plush thread during operation is equal to that of the ground thread. Any thread employed for the ground fabric may therefore serve also as plush thread and the plush loops may be much longer than at present.

The invention is illustrated in the accompanying drawing by way of example, which shows specimens of loop-plush fabric made according to the invention and in which

Figure 1 is a view of a plain knitted fabric having plush loops formed thereon in accordance with one form of the invention;

Figure 2 is a sectional view taken alone the line I—I of Figure 1; and

Figs. 3 and 4 show two kinds of plain fabric in which the ground-thread loops are formed in a special manner and the plush loops are arranged according to the invention.

The ground fabric shown in Fig. 1 is of the ordinary plain type and made from the thread 1. In each course two plush threads 2 and 3 are alternately knit into plush loops 2*a* and 3*a* each of which has twice the width of the sinker loop, i. e., each plush loop is not as in known loop-plush fabrics positioned at the width of the ground fabric sinker loop between the needle meshes but passes from one limb of the sinker loop across the needle meshes to the other limb of the adjacent sinker loop. The limbs of the plush-thread sinker loops above one ground-thread loop alternately consist therefore of two kinds of thread.

As clearly shown in Figs. 1 and 2, the broad plush loops do not lie in one line side by side in the direction of the course but are alternately disposed once in front and then again in the rear of the two adjacent loops. The plush loops occupy therefore in the direction of the course a greater width in space than in single loop plush fabric and fill better the space between the mesh heads, whereby not only the empty spaces or lanes in the direction of the wales are omitted but also those extending in the direction of the course are filled up much better than in ordinary loop-plush fabric.

In the fabric shown in Figs. 1 and 2 loops from the ground thread and the two plush threads are therefore knit by all needles during one loop-forming step. Furthermore, one plush thread of

a course, which in known manner is drawn out longer than the ground thread, is worked into a mesh together with the ground thread by every other needle, and the other plush thread, also drawn out longer than the ground thread, is formed into a mesh together with the ground thread by the interposed needles.

The method of producing the loop-plush fabric shown in Fig. 3 differs in so far as the course is composed of two successively worked partial courses. During the knitting of one partial course ground-thread loops are formed only above every other needle and only one of the two plush threads, after having been drawn out longer than the ground thread, is worked by these alternate needles into a mesh together with the ground thread. During the following sinking operation the second partial course is knit in which the ground thread is worked into a mesh by the needles that have not participated in the loop-forming step in the first partial course while the plush thread, also drawn out longer than the ground thread, together with the ground thread is made into a mesh by the needles participating in the loop-forming step in this partial course. These two partial courses shown in Fig. 3 together form a closed course, the only difference compared with the closed course shown in Fig. 1 being that the needle meshes and therefore also the plush loops are not arranged in a straight line but are somewhat staggered in the direction of the wales. This racking results in the known diagonal arrangement of the ground fabric needle meshes, and this ground fabric is therefore usually called "diagonal" fabric.

The loop-plush fabric shown in Fig. 3 possesses the same arrangement of the plush loops as the fabric shown in Fig. 1, with the difference, however, that owing to the knitting of a closed course from two partial courses the needle meshes in the course and wales are displaced relative to one another. The plush loops like those shown in Fig. 1 have twice the width of the sinker loops and passing over the adjacent plush loops cross the needle meshes.

The method of producing loop-plush fabric as shown in Fig. 4 is practically the same as the one described with reference to Fig. 3 except that after the working of a course from two partial courses during the knitting of the first partial course of the next course first those needles form loops again which in the preceding course have been operative in this respect during the working of the second partial course. Figs. 3 and 4 show these needles in cross section, the needles forming loops **5** being designated **5**^{a} and those forming loops **6** being designated **6**^{a}. If therefore the loops **6**, by the operation of every other needle of the row, have been made into a partial course and the second partial course has been formed of the loops **5** by the interposed needles, the needles will form partial or full courses in the production of the loop-plush fabric shown in Fig. 4 in the following order:

First course:
1st part. course: Needles **6**^{a} form the loops **6** and plush loops **2**^{a}.
2nd part. course: Needles **5**^{a} form the loops **5** and plush loops **3**^{a}.
Second course:
1st part. course: Needles **5**^{a} form the loops **5** and plush loops **3**^{a}.
2nd part. course: Needles **6**^{a} form the loops **6** and plush loops **2**^{a}.
Third course:
1st part. course: Needles **6**^{a} form the loops **6** and plush loops **2**^{a}.
2nd part. course: Needles **5**^{a} form the loops **5** and plush loops **3**^{a}, etc.

When producing loop-plush fabric of the kind shown in Fig. 3, the needles operate, however, as follows:

First course:
1st part. course: Needles **6**^{a} form the loops **6** and plush loops **2**^{a}.
2nd part. course: Needles **5**^{a} form the loops **5** and plush loops **3**^{a}.
Second course:
1st part. course: Needles **6**^{a} form the loops **6** and plush loops **2**^{a}.
2nd part. course: Needles **5**^{a} form the loops **5** and plush loops **3**^{a}.
Third course:
1st part. course: Needles **6**^{a} form the loops **6** and plush loops **2**^{a}.
2nd part. course: Needles **5**^{a} form loops **5** with plush loops **3**^{a}, etc.

This method of producing the ground fabric is known per se, and it is further known that when the needles are operated in the first manner the needle meshes of two partial courses unite to form a course in which the needle meshes lie in a straight line as in the fabric shown in Fig. 4, whereas if the needles are operated in the second order the two partial courses remain drawn out in the direction of the wales, as shown in Fig. 3.

The method can be applied by known means on knitting frames and machines.

I claim:

1. That method of producing a plush fabric from two ground threads and two plush threads, which comprises working one of said ground threads together with one of said plush threads at alternate wales to form a partial course, then working together the other of said ground and plush threads at the intervening wales to complete the course, and sinking in the respective plush threads of both of said partial courses during the working thereof so as to form longer loops therein than in the associated ground thread, whereby a ground thread loop and an associated plush thread loop will be floated over each wale in said course.

2. That method of producing a plush fabric from two ground threads and two plush threads, which comprises working one of said ground threads together with one of said plush threads at alternate wales to form a partial course, then working together the other of said ground and plush threads at the intervening wales to complete the course, sinking in the respective plush threads of both of said partial courses during the working thereof so as to form longer loops therein than in the associated ground thread, whereby a ground thread loop and an associated plush thread loop will be floated over each wale in said course, and then repeating the working of said partial courses in the order named at said alternate and intervening wales respectively.

3. That method of producing a plush fabric from two ground threads and two plush threads, which comprises the knitting of one of said ground threads together with one of said plush threads at alternate wales to form a partial course, then knitting together the other of said ground and plush threads at the intervening wales to complete the course, sinking in the re-

spective plush threads of both of said partial courses during the knitting thereof so as to form longer loops therein than in the associated ground thread, whereby a ground thread loop and an associated plush thread loop will be floated over each wale in said course, and then repeating the knitting of said partial courses in the order named at said intervening and alternate wales respectively.

4. That method of producing a plush fabric from two ground threads and two plush threads, which comprises the knitting of one of said ground threads together with one of said plush threads at alternate wales to form a partial course, then knitting together the other of said ground and plush threads at the intervening wales into a parallel partial course spaced from said first partial course a walewise distance less than the length of a knitted loop to thereby complete the course, and sinking in the respective plush threads of both of said partial courses during the knitting thereof so as to form longer loops therein than in the associated ground thread, whereby the ground thread loops and associated elongated plush thread loops of each partial course will be floated over the limbs of the knitted loops of the other partial course.

5. That method of producing a plush fabric from two ground threads and two plush threads, which comprises the knitting of one of said ground threads together with one of said plush threads at alternate wales to form a partial course, then knitting together the other of said ground and plush threads at the intervening wales into a parallel partial course spaced from said first partial course a walewise distance less than the length of a knitted loop to thereby complete the course, sinking in the respective plush threads of both of said partial courses during the knitting thereof so as to form longer loops therein than in the associated ground thread, whereby the ground thread loops and associated elongated plush thread loops of each partial course will be floated over the limbs of the knitted loops of the other partial course, and then repeating in the order named said steps of knitting a partial course at alternate wales and a spaced parallel partial course at the intervening wales.

6. A plush fabric comprising two pairs of threads, each pair including a ground thread and a plush thread and both pairs being knitted into every course; one of said pairs being knitted into alternate wales and floated across intervening wales in alternate courses, and being knitted into intervening wales and floated across alternate wales in intervening courses; and the other of said pairs being knitted into intervening wales and floated across alternate wales in alternate courses, and being knitted into alternate wales and floated across intervening wales in intervening courses, the floated portions of said plush threads being substantially longer than the floated portions of said ground threads.

7. A plush fabric comprising two pairs of threads, each course comprising two partial courses and each pair including a ground thread and a plush thread; one of said pairs forming the first partial course and being knitted into alternate wales and floated across intervening wales in alternate courses, and being knitted into intervening wales and floated across alternate wales in intervening courses; and the other of said pairs forming the second partial course and being knitted into intervening wales and floated across alternate wales in alternate courses, and being knitted into alternate wales and floated across intervening wales in intervening courses, the floated portions of said plush threads being substantially longer than the floated portions of said ground threads.

8. A plush fabric according to claim 7 wherein the second partial course is parallel to the first partial course and spaced from the latter partial course a distance less than the walewise length of a knitted loop.

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