(No Model.)

S. C. LISTER & J. REIXACH.

WOVEN PILE FABRIC.

No. 425,437. Patented Apr. 15, 1890.

Fig. 1.

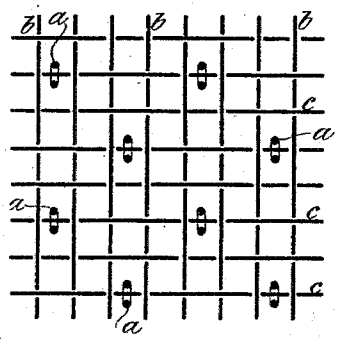


Fig. 2.

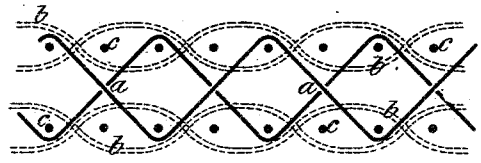


Fig. 3.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL CUNLIFFE LISTER AND JOSÉ REIXACH, OF BRADFORD, COUNTY OF YORK, ENGLAND, ASSIGNORS TO LISTER & CO., (LIMITED,) OF SAME PLACE.

WOVEN PILE FABRIC.

SPECIFICATION forming part of Letters Patent No. 425,437, dated April 15, 1890.

Application filed August 7, 1889. Serial No. 319,993. (No specimens.) Patented in England December 22, 1888, No. 18,794.

To all whom it may concern:

Be it known that we, SAMUEL CUNLIFFE LISTER, manufacturer, and JOSÉ REIXACH, manager, subjects of the Queen of Great Britain, both residing at Manningham Mills, Bradford, in the county of York, England, have invented certain new and useful Improvements in Woven Pile Fabrics, (for which we have received Letters Patent in Great Britain, No. 18,794, dated December 22, 1888,) of which the following is a specification.

Heretofore in looms for weaving velvet as a double pile fabric face to face a pile warp has been passed, together with a certain number of ground warps, through each of the spaces between the dents of the reed, and this pile warp has always been placed next to one of the dents, as it was advantageous to do so when the pile was tied in as a fast pile, as it usually was, with three or other number of picks of weft. Velvets have also been made with the pile loops tied in with a single pick of weft only, as described in the specification of a former British patent to us, No. 3,327, in the year 1878.

According to our invention we form a velvet with the pile tied in with a single pick of weft only and with each pile warp situated between two ground warps, which just before the tying in pick of weft is thrown are both moved in opposite directions to the pile warp—that is, when the pile warp is down and the shuttle passes over it the ground warps are up and the shuttle passes below them, so that in the completed fabric the loops of pile warp get nipped and held between the two ground warps which are on each side of them. The pile warps may be worked in two or more sections tied in at different times, as is also shown in the specification above mentioned.

Fabrics woven in the above manner may be woven in single-shuttle looms, where the same shuttle is used in the weaving of both top and bottom fabrics; but in order to weave them with fast selvages we prefer to weave them in double-shuttle looms, in which two shuttles are thrown simultaneously, one for the upper and the other for the lower fabric. We also form such loom in the manner described in the specification of a British patent granted to us, No. 2,629, in the year 1883.

If the fabric is woven in a single-shuttle loom, we can also obtain fast selvages by passing the shuttle three times between the warps of one fabric before passing it into the warps of the other fabric, or by combinations, say, of passing it three at one time and once at the next, and so on.

Velvets formed as above described we steam and then dye, and subsequently size on the back, if desired; or we dye the pile warp before weaving and afterward stiffen the fabric on the back, or first steam and then stiffen.

The drawings annexed show diagram views of a fabric woven in the manner we prefer for carrying out our invention.

Figure 1 is a face view of the cloth, the dots *a* representing the pile issuing from the ground of the piece. *b b* are the ground warps, and *c c* the wefts. Fig. 2 is a cross section of the double pile fabric before the pile between the two cloths is cut or severed. The dots *c* represent the weft-threads, and the dotted lines *b* represent the ground warps interweaving with the weft-threads. Fig. 3 shows one of the cloths after the pile has been cut or severed.

It will be seen that the pile warp, wherever it is caught into the ground, is caught by a single weft only, and that in addition the pile warp where it is so caught in has on each side of it a ground warp which passes above the weft, by which the pile warp is caught, and also a ground warp which passes below it, so that each pile-thread is bound between two ground warps above and two below the weft. In this way there is no crossing of two adjacent pile-warp threads in passing from one ground to the other—that is, when a warp-thread passes from the bottom ground to the top one there is not another pile-thread in close contiguity with and bearing against it, passing down from the top ground to the bottom one, and consequently each pile-thread standing out from both fabrics is held snugly by itself between the warps and between two succeeding picks of weft. As shown particularly in Fig. 1, the tufts of pile are secured to

the fabric by each alternate weft, and the tufts between any two warps are held by every fourth pick of weft. This is the preferred way of arranging the tufts of pile.

When the double pile fabric has been woven and the pile severed, the cloths are steamed and then dried, so as to set the loops of pile into the bent form in which they were held in the cloth. During the steaming the piece is held by its selvages on hooks which are fitted upon a carriage and placed into a steam-oven, which is hermetically closed and filled with steam under pressure. Afterward, if an undyed pile warp has been used, the piece is dyed, and is subsequently sized on the back. This may be done in the manner described in the specification of a former British patent granted to us, No. 590, in the year 1880.

If, in place of dyeing the piece after it has been woven with a gray pile warp, we use a dyed pile warp, then, when the piece has been woven and is out of the loom, we gum or stiffen the back of the cloth before it is finished, or we may first steam and then stiffen. The advantage of this is that the pile may be fixed before any finishing is done, which finishing need only consist of brushing and shearing or carding and shearing, whereas if the cloth is dyed in the piece the number of operations are a great many more before the back can be stiffened.

In our improved fabric pile marks are done away with, and this is because in our fabric each pile-thread standing out from the cloth is held snugly by itself between two succeeding picks of weft.

What we claim is—

1. A pile fabric in which each tuft of pile is caught by a single pick of weft only, and in which it is bound between two warps, one on each side of it, and both above the pick of weft, and also between two other ground warps below the pick of weft, substantially as described.

2. The herein-described pile fabric, in which each tuft of pile is caught by a single pick of weft only, and in which it is bound between two warps, one on each side of it, and both above the pick of weft, and also between two other ground warps below the pick of weft, said fabric being gummed or sized on the back, for the purpose specified.

3. A pile fabric in which each tuft of pile is caught by a single pick of weft only, and in which it is bound between two warps, one on each side of it, and both above the pick of weft, and also between two other ground warps below the pick of weft, substantially as described, the tufts of pile being secured to the fabric by each alternate weft, and the tufts between any two warps being held by every fourth pick of weft.

SAMUEL CUNLIFFE LISTER.
JOSÉ REIXACH.

Witnesses to the signature of the said Samuel Cunliffe Lister:

JOHN SOWDEN,
GEO. E. MUMFORD.

Witnesses to the signature of the said José Reixach:

JNO. SEE,
GEO. E. MUMFORD.