(Specimens.)

2 Sheets—Sheet 1.

A. WEBB.

WOVEN PILE FABRIC.

No. 491,693. Patented Feb. 14, 1893.

Fig. 1.

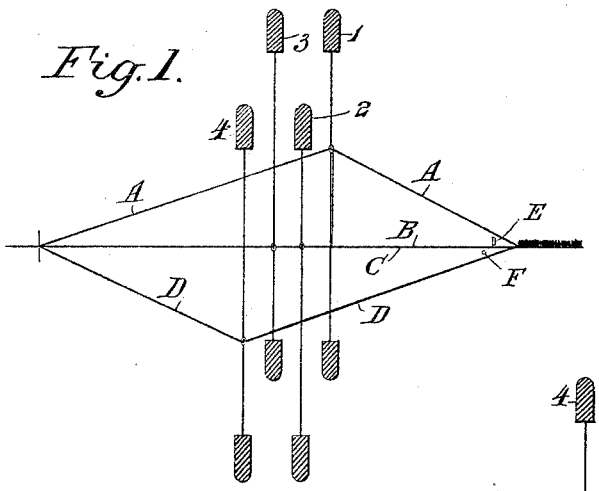


Fig. 2.

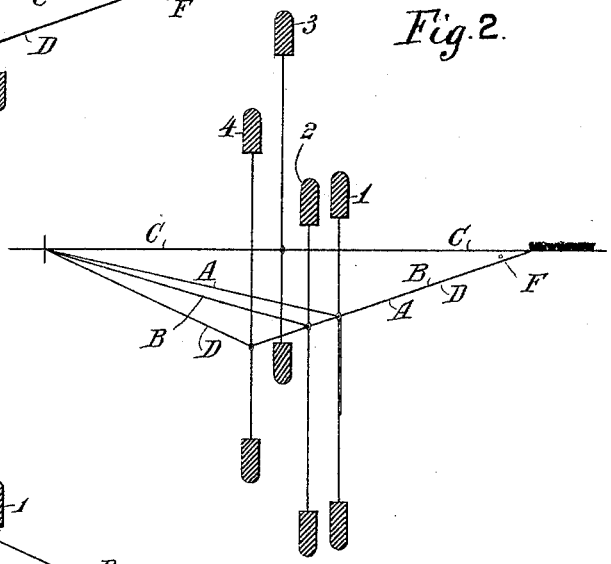


Fig. 3.

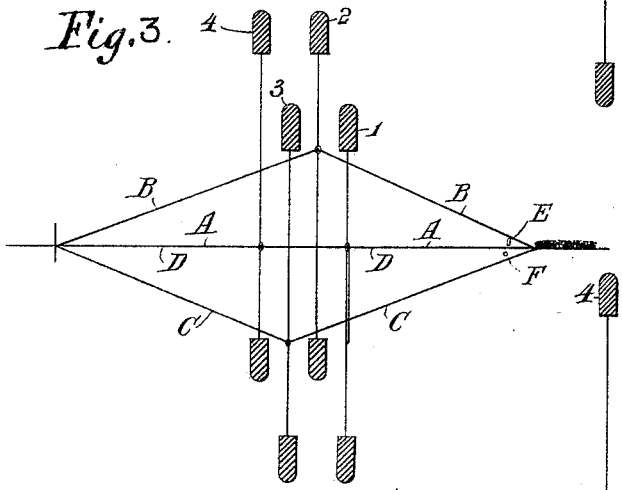
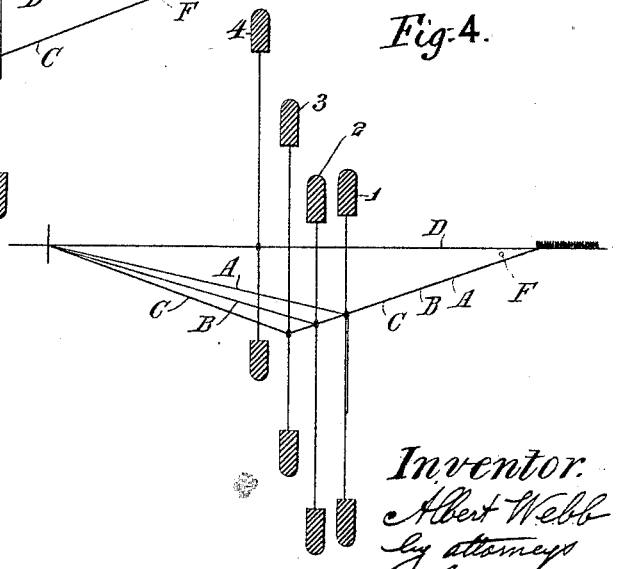


Fig. 4.



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Albert Mason Seward

Inventor:
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(Specimens.)

2 Sheets—Sheet 2.

A. WEBB.

WOVEN PILE FABRIC.

No. 491,693. Patented Feb. 14, 1893.

FIG. 5.

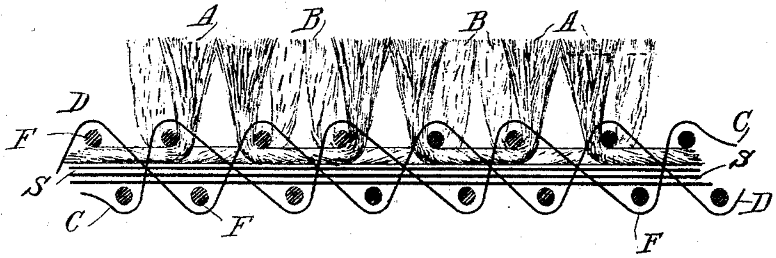
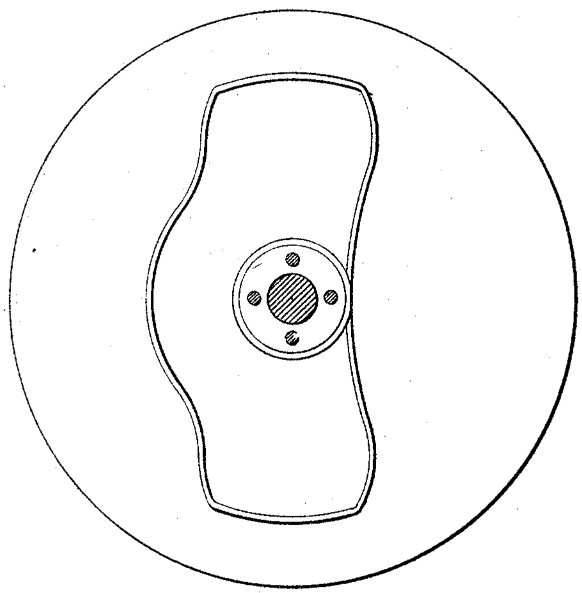


FIG. 6.



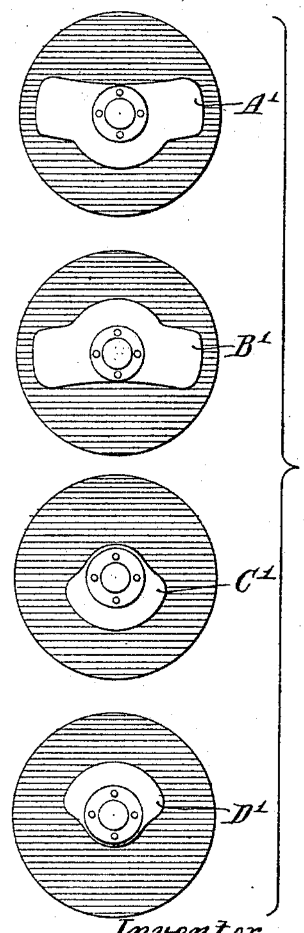


FIG. 7.

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[illegible]

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

UNITED STATES PATENT OFFICE.

ALBERT WEBB, OF WORCESTER, ENGLAND.

WOVEN PILE FABRIC.

SPECIFICATION forming part of Letters Patent No. 491,693, dated February 14, 1893.

Application filed February 13, 1892. Serial No. 421,386. (Specimens.)

To all whom it may concern:

Be it known that I, ALBERT WEBB, of Copenhagen Street, Worcester, in the county of Worcester, England, have invented certain new and useful Improvements in Woven Pile Fabrics, of which the following is a specification.

This invention relates to cut pile fabrics for carpets and rugs in which the pile is composed in part of horse-hair and in part of wool.

As heretofore manufactured what are known as hair carpets have a pile composed of spun horse-hair or partly of spun hair and partly of wool, the two materials being in some cases twisted or spun together to form a yarn. There is however, great want of richness of color in such carpets and rugs and a very limited scope for design, and moreover spun hair carpets have not yet been so made as to admit of their loops being severed to produce a cut-pile fabric, for the following reason, viz., the slippery surface of horse hair necessitates its being spun into a hard twisted yarn of rather large diameter as compared with the worsted yarns of which carpets are usually made. To secure this hard, slippery yarn firmly in its place, when the loops are to be cut, it is necessary that each thread of yarn used to form the surface loops should be securely bound, before being again brought to the surface. Ordinary wool yarn being soft, allows the lathe or sley to beat the first weft partially under the wire forming the pile, and after the second weft is shot across, the sley beats the wire of the next loop partially over it, so that the wires forming the successive loops are nearly touching each other when the process is complete, but the hard hair yarn will not give way to the blow of the sley, but keeps the first weft some distance from the first wire, and the second wire, in similar manner, is kept away from the second weft, the result being, a space between the two wires, nearly equal to the thickness of another wire. When the loops of a wool carpet are cut, the fibers stand so close together that they support each other, and present a uniform and even surface, but if the same be done with a horsehair carpet made as above described, the fibers, which are fewer in number (on account of their greater thickness), are some distance apart, and receive no mutual support, so that a ridgy and uneven appearance is seen on the surface.

My invention consists in the fabric hereinafter described and claimed in which the surface is composed of alternate rows of tufts of wool warp and tufts of hair warp and in which there are two shots of weft above the hair and wool warps for every tuft of each of said warps, each of said shots serving to bind a tuft of wool and a tuft of hair and lying between a row of wool tufts and a row of hair tufts and each being separately secured by chain warps, such fabric being free from the defects hereinbefore mentioned in what have been hitherto known as hair carpets and rugs.

In the manufacture of carpets and rugs according to my invention I place the threads of hair and of wool, wound on bobbins, in creel frames, in the manner commonly practiced in the Brussels carpet manufacture. Or the threads may be wound upon beams, as in weaving tapestry carpets, or part may be on a beam or beams, and part in the creel frames, as before mentioned. The threads put in the creel frames will be dyed, when necessary, and those on the beams may either be dyed, or may have a pattern printed on them in a similar manner to the process ordinarily employed in preparing worsted yarns for weaving tapestry carpets.

To produce the fabric in a Jacquard carpet loom, the threads of hair are drawn through the eyes of their healds in the ordinary manner, and I prefer to draw them into the row of healds known as the first "quarter," that being the row nearest to the lathe or sley. The remaining threads of wool, will be put in similar manner in the remaining quarter or quarters, according as it may be desired to make two, three, four, or five frame carpet, and a thread from each quarter will then be put in each reed or division of the sley. In making stair carpet, however, the borders may, if desired, be entirely of wool, wool threads taking the place of hair threads in these parts, as there is always less wear on the borders of a stair carpet than on the middle part. The threads are raised for the insertion of the wire required to form the pile, by cards operating on the jacquard in the usual manner which cards are so designed

that they will raise the whole of the hair threads at each alternate lift of the jacquard, and the whole of the wool threads at the intervening lifts.

To produce the fabric in a tapestry carpet loom, it will be necessary to provide two healds such as are ordinarily used in weaving tapestry carpets, and are known as print healds or pole-shafts for operating the surface threads, which healds will be actuated by cams of a peculiar configuration and arrangement. The ordinary cam, as is well known, first raises its heald to its highest point for one quarter of a revolution of the cam box (which turns once in four revolutions of the loom), and subsequently draws the heald down to its lowest point for the second quarter revolution, repeating these actions for the two quarters remaining to complete one revolution of the cam box. The cam I require acts in the first two quarter revolutions in the same manner as the ordinary cam, but in the third quarter revolution it lifts the heald only about half the height, thus bringing the face threads in the heald to a position about midway between the highest and the lowest points. In the fourth quarter, it draws the heald down in the same manner as the ordinary cam. The cams which operate the first and second healds, which contain the face threads, are so placed in the cam box, that when the first is at its highest point, the second is at its middle height, and vice versa, both healds being drawn down together at every half revolution of the cam box. The threads of hair will be drawn through the eyes of the first heald, and the wool threads through the eyes of the second heald. The chain warps known as stuffers represented by the straight lines S S in Figure V may be entered in the long eyes of the front print heald only. I prefer to work both the hair and the wool threads off a creel in a Jacquard loom, but with a tapestry loom, one set of threads may be on a beam, and another working from a creel, or both may be beamed.

In weaving, whether in a Jacquard or tapestry loom, I proceed in the manner indicated by Figs. I, II, III, and IV of the drawings, to produce, in succession, the sheds for the reception of the weft shoots, and the terry wires forming the pile.

Figs. I, II, III, and IV, show the succession of sheds for the four steps required to form one course of work, and Fig. V represents a section on an enlarged scale of the fabric which constitutes my invention taken parallel with the warp. Fig. VI shows the modified form of cam required to work the healds for the face threads. Fig. VII shows the set of cams required in a loom provided with two healds for working two groups of face threads, the working positions of the cams being arranged relatively to each other.

Assuming the first heald (1) to receive the hair threads marked A in Figs. I, II, III, and IV, and the second heald (2) to receive the wool threads B, and the other healds (3, 4) of the loom to operate the cotton or linen chain warps or threads C, D, the process is as follows:—The warps C D are entered by putting two consecutive threads in two consecutive eyes in the heald 3, followed by two next consecutive threads in two consecutive eyes on heald 4, and so on.

In Fig. I, it will be seen that the threads A are raised to their greatest height, the threads B to a middle height, which I call the "level," the threads C to the same level, and the threads D will be at their lowest point, or lathe bed. In this position of affairs, a wire E, such as that ordinarily used for weaving Brussels or velvet pile carpet, is inserted between threads A and B by any of the ordinary means employed in carpet looms for this purpose, and a weft of linen or other suitable thread F is shot across from right to left between threads C and D, thereby completing the first step in the course. After the beating up, the threads A are drawn down, together with the threads B, to the lowest point or lathe bed, passing through the threads C, which will remain unchanged; the second shed is thus formed, as illustrated by Fig. II. The weft F is now shot across from left to right, under the threads C, and above all the other threads. The beating up by the lathe now takes place, and this completes the second step in the course, the first binding thread put over the threads A, tying down the row of hair loops on the wire, which will subsequently be withdrawn, as usual. The threads B are next raised to the highest point, as shown in Fig. III. The threads A being raised to the middle height or level, the positions of the chain warps C and D are now reversed, D being at the level, and C at the lowest point, or lathe bed. A wire is then inserted, as before, between threads B and A, and a weft is shot from right to left between threads D and C. After the beating up, the third step of the course will be completed. The threads B, together with threads A, will next be drawn down to the lathe bed, passing through the chain threads D, which will remain unchanged, as shown in Fig. IV. A weft will be shot from left to right, between D and the rest of the threads, and be beaten up, thus putting the second binding thread over the threads B, forming a row of loops of wool across the fabric, like the hair loops before formed, and completing the fourth step of the course. The movements of the heddles, to produce these several changes of shed, will be effected by the several cams, A′, B′, C′, D′, arranged as shown in Fig. VII. The round of movements will then commence again, as first described, by which the threads B will, in their turn, receive their second binding thread, before being again raised to form the surface.

A fabric woven in the manner above described only requires its loops to be severed to form the cut pile fabric which is shown in

Fig. V of the drawings and which constitutes my invention. The cutting may be produced in the process of weaving in the usual way. In this fabric every tuft or loop forming part of the surface of the fabric is securely bound in with two wefts above it and the whole surface of the fabric, with the exception of the border as before mentioned, has a sufficient and evenly distributed quantity of hair upon it to support and protect the tufts of wool pile between which it is placed. The said fabric may be produced with brighter coloring and greater decorative effect than is possessed by the ordinary horse-hair carpets.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim is:—

A cut pile fabric having its surface composed of alternate rows of tufts of wool and hair and consisting of hair warps, wool warps and chain warps and a weft of which there are two shots above the hair and wool warps for every tuft of each of said warps, each of said shots serving to bind a tuft of wool and a tuft of hair and lying between a row of wool tufts and a row of hair tufts and each being separately secured by the chain warps, substantially as herein described.

ALBERT WEBB.

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ARTHUR C. DERRETT,
Clerk to J. H. Hooper, Solicitor and Notary, Worcester.