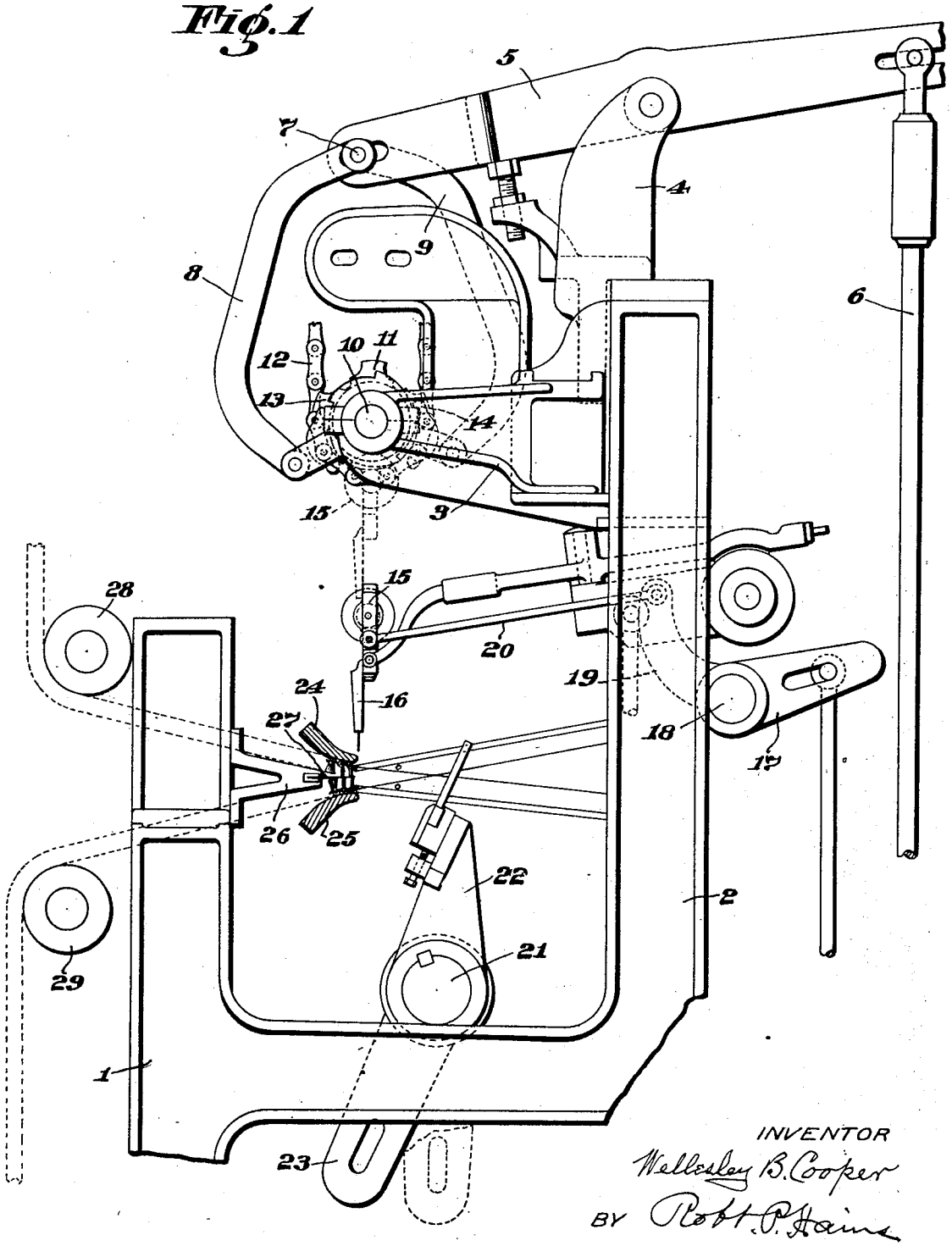
March 27, 1934. W. B. COOPER 1,953,044

METHOD OF PRODUCING DOUBLE TUFT PILE FABRICS

Filed March 25, 1932 2 Sheets-Sheet 1

Fig. 1



INVENTOR
Wellesley B. Cooper
BY Robt. P. Haines
ATTORNEY

March 27, 1934. W. B. COOPER 1,953,044

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Filed March 25, 1932 2 Sheets-Sheet 2

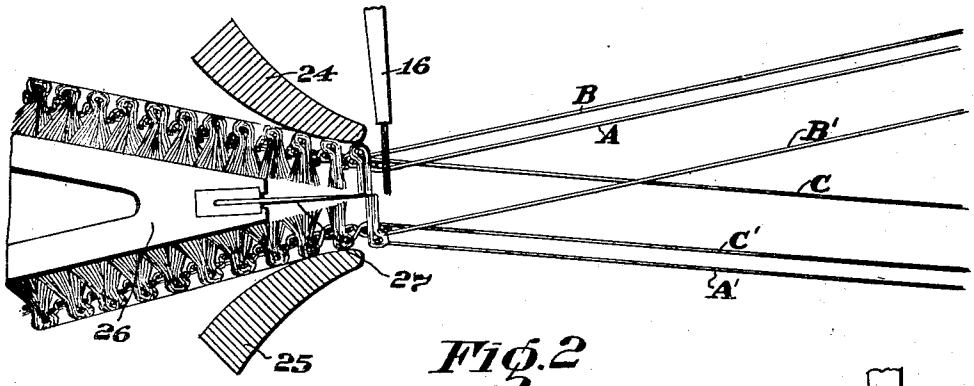


Fig. 2

Fig. 3

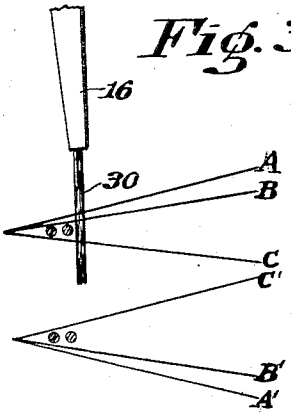


Fig. 4

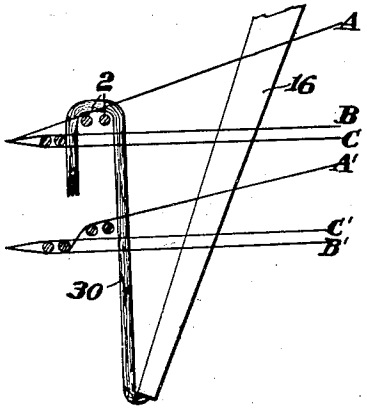


Fig. 5

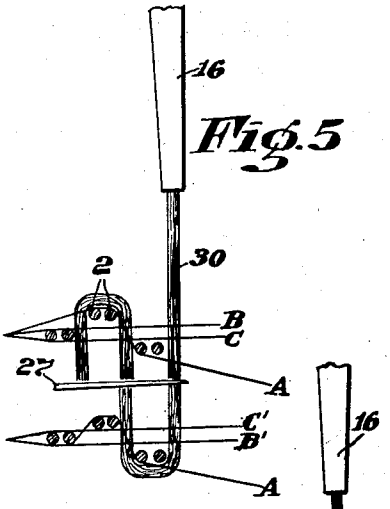
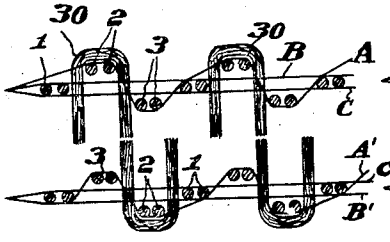


Fig. 6



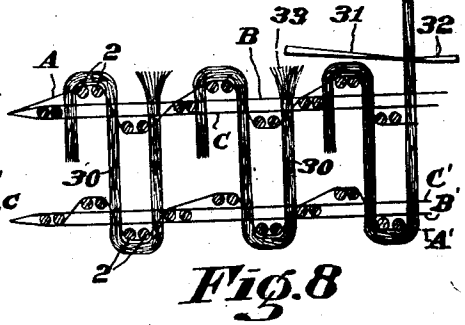


Fig. 8

Fig. 7

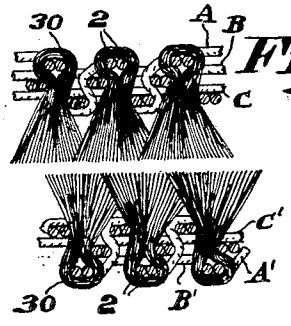
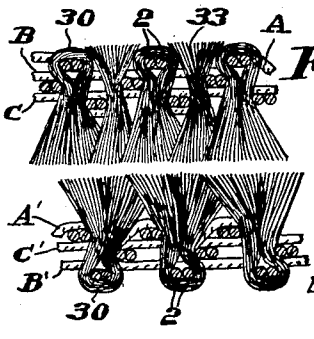


Fig. 9



INVENTOR
Wellesley B. Cooper
BY Robert P. Hains
ATTORNEY

Patented Mar. 27, 1934 1,953,044

UNITED STATES PATENT OFFICE

1,953,044

METHOD OF PRODUCING DOUBLE TUFT PILE FABRICS

Wellesley B. Cooper, Amsterdam, N. Y., assignor to Bigelow-Sanford Carpet Co., Inc., Thompsonville, Conn., a corporation of Massachusetts

Application March 25, 1932, Serial No. 601,091

12 Claims. (Cl. 139—8)

This invention relates to the method of weaving double tuft pile fabrics.

Woven pile fabrics may be divided into two general classes. First, those in which the pile surface is formed by looping some of the weaving threads over pile wires during the weaving operation and withdrawing the pile wires to leave a cut or uncut pile surface. Second, those in which the pile surface is produced by pile forming yarns introduced as tufts into the fabric near the weaving point from an extraneous supply. Pile fabrics of the second class are generally known as tuft pile fabrics, and may be typified in Axminster or similar carpets or rugs, and it is to this general class of fabric and method for their production that the present invention relates. In weaving pile fabrics of the first class wherein the pile surface is produced by pile forming warp threads looped about pile wires, it has been a well known practice to produce such fabrics either singly or double, but in tuft pile fabrics the problem for the production of more than one in a single operation presents difficulties by reason of the fact that the pile forming yarn is taken from an extraneous supply and transferred to the weaving point where it must be presented to both webs being woven.

One of the objects of the present invention is to provide a method whereby double tuft pile fabrics may be readily produced in one operation so that when the two webs are cut apart two tuft pile fabrics result.

In recent years a pronounced demand has arisen for tuft pile fabrics such as Axminster carpets and rugs, or the like, which shall have the pattern of the pile surface produced upon the back, and as a further development of the present invention this is accomplished during the production of the double tuft pile fabric.

The present invention will be described in connection with or the production of tuft pile fabrics of the Axminster type, but in the broader aspect of the invention it is not confined to this particular class of fabrics.

In accordance with the present invention two warp sheds are provided and the tuft pile forming yarns are looped about corresponding weft shots in the two sheds, and, in the production of the pattern on the back, the pile forming tuft yarns are looped about back weft shots in each of the two sheds, so that when the webs are cut apart by severing the tuft yarns each web will present the pattern of the pile on the back.

The invention and novel features thereof will best be made clear from the following description and accompanying drawings of one good embodiment thereof.

In the drawings:—

Fig. 1 is a side elevation of sufficient portions of an Axminster loom to make clear the method of the present invention and the fabric resulting from the practice of such method;

Fig. 2 is an enlarged detached view showing the formation of the respective sheds and the cutting mechanism for separating the two webs;

Figs. 3, 4, 5 and 6 are diagrammatic views showing the steps of the present method and the resulting two tuft pile fabrics;

Fig. 7 is an enlarged view showing the two tuft pile fabric webs as cut apart;

Fig. 8 is a diagrammatic view of a modification; and

Fig. 9 is a similar view of the two tuft pile fabrics produced under the modification of Fig. 8 and cut apart.

The method of the present invention and the tuft pile fabric produced thereby will be described in connection with an Axminster loom which lends itself advantageously to the performance of the method and the production of the double tuft pile fabric.

The loom shown in Fig. 1 is of the general Axminster type except as modified in accordance with the performance of functions required by the method of the present invention and only so much of the loom is indicated as is required for a complete disclosure of the invention to one experienced in the art of Axminster weaving.

The loom frame 1 may be of appropriate construction for the support of the operating parts and rising therefrom are the standards 2 which support appropriate brackets 3 for the usual carrier chain and its operating mechanism. As shown, the standard 2 has rising therefrom the bracket 4 on which is mounted the rocking lever 5 which is operated by an actuator 6 from a usual going part of the loom now well understood. The rocking lever 5 has pivotally connected thereto at 7 the arms 8 and 9 which may be of usual type and mounted on the shaft 10 is the sprocket wheel 11 about which passes the carrier chain 12, as usual. The arms 8 and 9 through the actuation of the rocking lever 5 give a progressive step-by-step movement to the sprocket 11 through the push and pull pawls 13 and 14 whereby the step-by-step movement of the carrier chain 12 is accomplished.

The carrier chain 12 supports tube frames 15, only one of which is indicated in the present illustration of the machine.

As the weaving proceeds successive tube frames are detached from the carrier chain 12 to present the pile forming tuft yarns to the weaving point and the only difference between the tube frames 15 and those of usual construction is that the yarn presenting tubes 16 of the tube frames are sufficiently long to carry the tuft yarn to the weaving point of the two warp sheds as will presently appear. The means for transferring a tube frame from the chain carrier 12 may be of usual construction, as indicated, except that means are provided for tilting the tube frame and consequently the presenting tubes 16 when the latter are in the lower of the two sheds to thereby permit the insertion of the back weft shots in the lower shed. This means comprises a rocking lever 17 pivoted at 18 and having its upwardly extending arm 19 connected by a link 20 to the tube frame presenter, and thereby impart rocking movement thereto.

Pivotally mounted at 21 on the loom frame is the reed carrying arm 22 on which the usual reed of the Axminster loom is secured and such arm 22 is given its appropriate rocking movements to beat up the weft by connections with the lower arm 23 thereof, which may be actuated as usual from a going part of the loom.

Mounted upon the loom frame are the two breast plates 24 and 25 between which the two webs may pass during weaving. The loom frame carries the knife guide 26 in which is mounted for reciprocating movement the knife 27 which serves to cut the pile forming tufts and separate the two webs, as indicated in Fig. 1. Appropriate means such as the take-up or spike rollers 28 and 29 serve to take up the two webs during the weaving operation.

In accordance with the present invention two warp sheds are formed for the production of two webs, as indicated in Figs. 1 and 2, where they are shown, one above the other.

Each of the two sheds or warp sets may be associated with weft shots in any usual manner, but as indicated in the present instance of the invention each shed is formed of a chain or binder warp A and A' and the stuffer warps B and C, and B' and C' and one complete cycle is comprised in the three weft shots 1, 2 and 3.

Fig. 3 shows the first step in the weaving cycle according to the present method, wherein the free end of the tuft yarn 30 is passed through the warp threads of the upper shed and extended to a point between the upper and lower sheds. The back weft shot 2 of the upper shed and the face weft shot 3 of the lower shed are then laid, preferably by two needles acting simultaneously, and the tuft yarn 30 is looped about the back weft shot 2 of the upper shed. The tube 16 of the tube frame 15 is then moved downwardly, passing between the warp threads of both sheds and the tube frame is tilted, Fig. 4, to permit the introduction of the back weft shot 2 of the lower shed, the two webs having been moved forward in the meantime with the result that the corresponding back weft shots 2 in the upper and lower sheds are staggered relative to each other, as clearly indicated in Figs. 5 and 6. The pile forming tuft yarn 30 is then looped about the back weft shot 2 in the lower shed by upward movement of the tube 16, as indicated in Fig. 5, the pile forming tuft yarn may then be cut by the knife 27 between the two sheds, whereupon the tube 16 is raised to carry the freed yarn 30 out of the upper shed into the position indicated in Fig. 1 ready for the next cycle of loom operation.

As indicated in Fig. 6, the two weft shots 2 one in the upper and the other in the lower shed, are arranged in staggered relation, with the result that the tuft yarn when looped about the weft shots in the two sheds take a sinuous course between the two sheds.

When the pile forming tuft yarn 30, as indicated in Fig. 6, has been cut and the two webs thus separated, the pattern of the pile surface in each web will appear at the back, a condition which is best indicated in Fig. 7 where the two webs are shown with the threads beaten to place.

In the construction thus far described it will be noted that the knife 27, Fig. 5, has severed the continuous run of tuft yarn between the two webs and has likewise severed the standing part of the yarn between the two webs to produce the tuft pile surface and separate the webs as the two webs are woven.

It may be desirable at times to amplify the pattern effect on the back of at least one of the webs and to this end the method contemplates severing the standing portion of the tuft yarn 30 above the warp threads of the upper shed by the knives or cutters 31 and 32, thus producing at the back of the top web a further amplification of the pattern on the back by the end 33 of the tuft yarn.

The condition described with respect to Fig. 8 is portrayed in Fig. 9 where the threads of the fabric have been beaten to place and it will be noted that the ends 33 of the tuft yarn extend between the looped portions of the tuft yarn where they pass about the back weft shots.

In the present disclosure of the invention each web is formed of the three warp threads A, B and C, or A', B' and C', of which A and A' are the chain or binder threads, so that when the threads are beaten to place they present the condensed structure illustrated by Fig. 7, both webs presenting the pattern of the pile forming tufts at the back.

When the double tuft pile fabric is produced under the method indicated in Fig. 8, the two webs may remain united until after the completion of the weaving operation and thereafter separated by a separate cutting action, but in either case, such as in Figs. 6 and 7, the pile forming tuft yarn passes about corresponding but staggered weft shots in the two sheds.

What is claimed is:—

1. The method of weaving a double tuft pile fabric, which consists in forming two warp sheds for the production of two webs, introducing the free end of a pile forming yarn between the warp threads of one shed, then looping the pile forming tuft yarn about a weft shot in that shed, thereafter passing the pile forming yarn through the warp threads of the opposite shed and looping the pile forming yarn about a weft shot in the opposite shed and then cutting the pile forming the yarn.

2. The method of weaving a double tuft pile fabric, which consists in forming two warp sheds for the production of two webs, introducing the free end of a pile forming yarn between the warp threads of one shed, then looping the pile forming tuft yarn about a weft shot in that shed, feeding the warps in both sheds longitudinally and looping the pile forming yarn about a weft shot in the opposite shed that the second formed loop shall be arranged in staggered relation with the loop in the first mentioned shed, and cutting the pile forming yarn.

3. The method of weaving a double tuft pile

fabric, which consists in forming two warp sheds for the production of two webs, introducing the free end of a pile forming yarn between the warp threads of one shed, then looping the pile forming tuft yarn about a back weft shot in that shed, feeding the warp threads of both sets longitudinally then looping the pile forming yarn about a back weft shot in the opposite shed that the loops shall be in staggered relation and each web shall present the pattern of the tuft pile on the back.

4. The method of weaving a double tuft pile fabric, which consists in forming two warp sheds for the production of two webs, passing the free end of pile forming tuft yarn through the warp threads of one shed, then looping the standing part of the same pile forming yarn about a weft shot in the opposite sheds in succession, and cutting the pile forming tuft yarn.

5. The method of weaving a double tuft pile fabric, which consists in forming two warp sheds for the production of two webs, holding the tuft yarn with one end free and passing the free end between the warp threads of one shed, then looping the held portion of the same pile forming yarn in succession about weft shots arranged in staggered relation in the two opposite sheds that the tuft yarn shall take a sinuous course between the sheds, and cutting the tuft yarn.

6. The method of weaving a double tuft pile fabric, which consists in forming two warp sheds for the production of two webs, holding the pile forming tuft yarn with one end free, looping the free end of the tuft yarn about a weft shot in one shed, passing the held portion of the tuft yarn between the warp threads of the other shed and looping it about a weft shot in that shed and severing the held portion of the tuft yarn.

7. The method of weaving a double tuft pile fabric, which consists in forming two warp sheds for the production of two webs, holding the pile forming tuft yarn with one end free, looping the free end of the tuft yarn about a back weft shot in one shed, passing the held portion of the tuft yarn between the warp threads of the other shed and looping it about a back weft shot in that shed and severing the held portion of the tuft yarn.

8. The method of weaving a double tuft pile fabric, which consists in forming two warp sheds for the production of two webs, introducing the free end of a pile forming yarn between the warp threads of one shed to a position substantially midway between the two sets of warp threads, then looping the pile forming tuft yarn about a weft shot in that shed, then moving the two sets of warps longitudinally and looping the pile forming yarn about a succeeding weft shot in the opposite shed.

9. The method of weaving a double tuft pile fabric, which consists in forming two warp sheds for the production of two webs, holding the pile forming yarn with one end free introducing the free end of the pile forming tuft yarn between the warp threads of one shed, looping the held portion of the pile forming yarn about a weft shot in one shed and binding it about a weft shot in that shed, then passing the held portion of the tuft yarn between the warp threads of the opposite shed and binding it about a succeeding weft shot in that shed.

10. The method of weaving a double tuft pile fabric with the pattern of the pile on the back of each web, which consists in forming two warp sheds for the production of two webs, looping pile forming tuft yarn about a back weft shot in one shed, then locping the pile forming tuft yarn about a back weft shot in the opposite shed, returning the pile forming tuft yarn to the first shed and cutting it above the warp threads of the first mentioned shed.

11. The method of weaving a double Axminster fabric, which consists in forming two warp sheds for the production of two webs, moving a tube frame to pass the free ends of tuft yarns between the warp threads of one shed and looping the tuft yarns about a weft shot in that shed, passing the tubes of the frame between the warp threads of the other shed and looping the tuft yarns about a weft shot in that shed, withdrawing the tube frame and cutting the tuft yarns between the two webs.

12. The method of weaving a double tuft pile fabric which consists in providing two sets of warps for the production of two webs, introducing the tubes of a tube frame between the warp threads of one shed with the free ends of the pile forming yarns between the two sets of warp threads, looping the tuft yarns about a weft shot in one shed, passing the tubes of the tube frame between the warp threads of the opposite set of warp threads, looping the tuft yarns about a weft shot in that set, withdrawing the tube frame, and cutting the tuft yarns.

WELLESLEY B. COOPER.