Nov. 2, 1943. E. LAMBERT 2,333,258

METHOD OF SIMULTANEOUSLY PRODUCING DOUBLE FACED PILE AND FLAT FABRICS

Filed Jan. 14, 1943

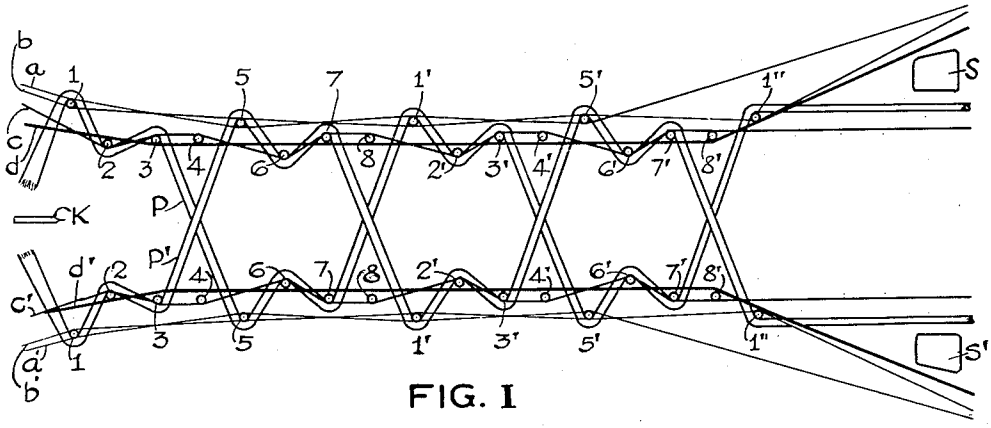


FIG. I

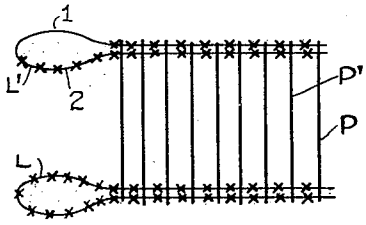


FIG. II

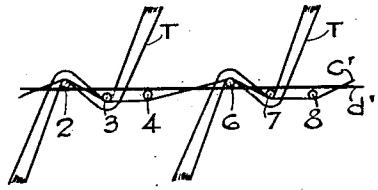


FIG. III

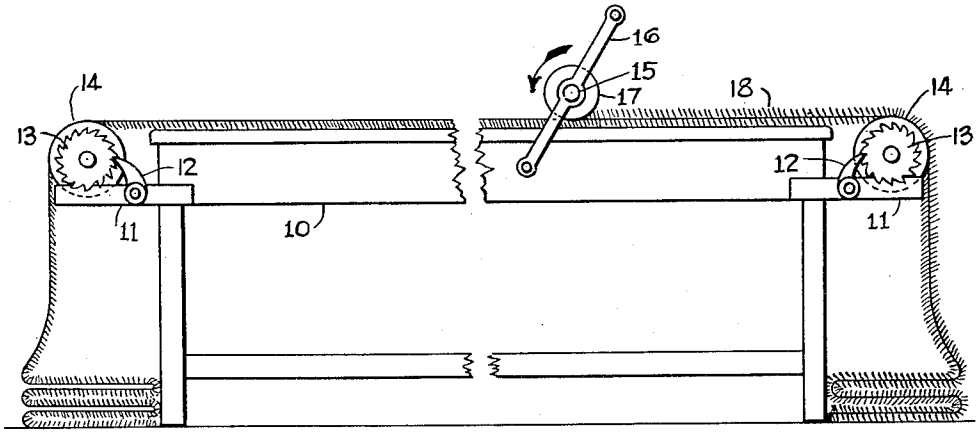


FIG. IV.

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METHOD OF SIMULTANEOUSLY PRODUCING DOUBLE FACED PILE AND FLAT FABRICS

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5 Claims. (Cl. 28—72)

This invention relates to a process of weaving and to the simultaneous production of a plurality of different types of fabrics. More particularly, I produce one or more double faced pile fabrics and one or more flat fabrics joined thereto by pile forming threads. In some instances, the flat fabrics are joined to the pile fabric at the selvages by reason of the fact that the wefts of both are formed from the same yarn in the weaving process. The double pile face of the pile fabric or fabrics results from the separation of the two types of simultaneously woven fabrics after severing of wefts at the selvage and/or after severing of the interconnecting pile forming threads.

According to a preferred embodiment of my improvements, I simultaneously weave a fabric blank which is ultimately separated into four fabrics, i. e., two double pile faced fabrics and two flat fabrics. This separation can be affected completely or partially on the loom. For convenience, I prefer to separate the pile fabrics from each other on the loom and to separate the pile fabrics from the flat fabrics subsequent to removal from the loom.

Double faced pile fabrics have been made for many years. The prior methods of their manufacture were slow, wasteful, laborious and many times resulted in defects which were not found until after finishing, i. e., when the fabric should be ready for marketing. I have avoided these prior difficulties, have reduced the cost of production, have produced four fabrics simultaneously without waste and I have accomplished these results in a novel manner and with a minimum amount of loom modification.

My process may conveniently be carried out on a double weft carrier loom, such as a double shuttle loom in which the shuttles pass through the warp shed simultaneously either in the same or opposite directions. When a double shuttle loom is used, the wefts or filling threads of a flat fabric and of its companion pile fabric are inserted by the same shuttle and hence the flat fabric and the pile fabric are joined together by the weft threads at the selvage edges of the fabrics. This may result, by proper selvage shedding, in relatively small tube-like selvages, which can be cut at their edges as will be understood. The pile forming yarns are severed on the loom in a conventional and well known manner.

After severance of the interconnecting pile forming yarns, the fabrics are removed from the loom and the tubular selvages are cut open with the result that a flat fabric and a pile fabric are joined together in the pile area and by pile tufts only. In other words, the grounds formed by the pairs of warps, *a*, *b*, *a'*, *b'*, *c*, *d*, and *c'*, *d'* and the weft threads may be connected at the selvages but are not connected other than by pile forming threads or tufts in the pile area. Subsequent to this pile cutting and selvage cutting, in such cases as selvage cutting is necessary, the two fabrics can be separated by a pulling action. This pulling action will cause that portion of the pile tuft which is engaged with the flat fabric to pass through its own ground and about the filling thread of the flat fabric and thus form a pile face on two sides of its own ground without any waste whatsoever. The woven in wefts of the flat fabric cannot be broken and left connected to the pile tufts as they are gripped at a multitude of points along their length by the warp threads with which they are interwoven.

As before stated, the complete operation may be done on the loom by adding selvage cutters and separating rollers to the loom. I prefer, however, to keep the loom modification to a minimum and to perform the final separating step after the pile has been cut on the loom and the fabrics removed from the loom. This is a simple and rapid operation and permits a close inspection by the operator. It may be started by hand.

An object of my invention is to provide a method of weaving a plurality of different types of fabrics simultaneously.

Another object is to provide an improved method of weaving double faced pile fabrics by weaving conjointly with other fabrics.

Another object is to provide a method of producing double faced pile fabrics by weaving on a double shuttle loom and by separating them from other fabrics with which they are simultaneously woven.

Other objects of invention will be manifest from a consideration of the following description, claims and drawing in which:

Figure I is a diagrammatic view of four fabrics being produced simultaneously in such a manner that they can be subsequently separated.

Figure II is a diagrammatic view looking warpwise of the fabric blank and illustrating tubular selvages of different types.

Figure III is a diagrammatic side view of a small portion of a completed double faced pile fabric produced according to my improvements.

Figure IV is an illustration of a table and pull

off device for securing the fabric and separating the different types of fabrics from each other.

Referring now to the drawing in detail. In Figure I I have illustrated a method of weaving based on an 8-pick repeat. Stated another way, each pile yarn completes its cycle of operation and will form a tuft in both the upper and lower fabrics for each 8 double picks of the loom's operation. Upper and lower wefts are consecutively numbered 1, 2, 3, 4, 5, 6, 7, 8 and 1', 2', 3', 4', 5', 6', 7', 8' and 1''. It will be noted that wefts 1, 5, 1', 5' and 1'', etc., are connected with the grounds of the flat fabric and the pile fabric only at the selvages.

The upper warps, *a*, *b*, and the lower warps, *a'*, *b'*, extend in pairs the full width of the pile area and may or may not form a woven selvage. At least one pair of these warps should be outside the last pile forming yarn at each side of the pile fabrics in order to more definitely insure that all of the desired tufts are drawn through their backing to form a uniform pile face on both sides of the backing.

The pile fabric backing threads, *c*, *d* and *c'*, *d'* may interweave in various ways with the wefts 2, 3, 4, 6, 7, 8, etc., which are inserted as by upper and lower shuttles S, S', but according to the illustrated embodiment *c*, *c'* are slack warps and *d*, *d'* are tight warps. The pile fabric backings are woven with one weft over the tight warps and two wefts under the tight warps when the fabrics are viewed face up before separation. Wefts 1, 5, etc., are not interlaced with the backing warps *c*, *d* and *c'*, *d'* but are joined to the pile fabric only by forming the loop selvages at the edges of the fabrics and by the pile forming yarns P, P'. These pile forming yarns P, P', after severance by the knife K, form a tuft having two legs, one of which legs is drawn through the pile ground to form a fabric having a pile face on both sides as illustrated, for example, in Fig. III.

It will be noted from the diagrammatic showing in Fig. II that the loop selvage may be a completely woven selvage as at L or partially woven as at L'. One blade of a scissors (not shown) may be inserted in these loops and the weft threads which interconnect the two backings may be conveniently and progressively severed.

This severing of the selvage loops may be done on a table as illustrated in Fig. IV or prior to mounting the fabric on this table. In general, the table is of a known form such as has been used in a cutting of corduroy fabrics. It consists of a frame 10 having brackets 11 on each end which serves as a mounting for a pawl 12 and a ratchet 13 which is mounted at the end of a drag roller 14 to hold a section of the fabric stock in position. A roller 15 extends the width of the table and has a double handle 16 by which it may be turned. It will thus be seen that when an end of the flat fabric 17 is secured to the roller 15 that such flat fabric 17 may be rolled upon the roller 15 and separated from the pile fabric portion 18. As previously explained, this separation draws selected portions or legs of the pile tufts T through the backing of the pile fabric and forms a pile face on both sides of the fabric.

I have illustrated my invention in connection with double shuttle weaving but in the broadest sense, it is not restricted to weaving on the double plush principle. The use of a transverse wire loom is contemplated to be within the scope of the claims.

The flat fabric is in many cases a usuable fabric and may be formed from various sizes and types of warps and wefts arranged in different interweavings. I do not wish to be limited by the exact weave of either the flat fabric or of the double faced pile fabrics formed according to the preferred embodiments and wish to be limited only by the scope of the attached claims and their equivalents.

Having described my invention, I claim:

1. A process for the simultaneous manufacture of woven pile and flat fabrics which includes simultaneously weaving a ground for a pile fabric and a flat fabric while interconnecting the ground of the pile fabric and the flat fabric in the pile forming area by continuous pile forming yarns only, severing the pile forming yarns to form pile tufts and then separating the two fabrics while simultaneously pulling a portion of the interconnecting pile tufts through the ground of the pile fabric and through the flat fabric.

2. In a process of woven fabric manufacture, the steps which include providing two sets of warp threads, shedding each set of warp threads as the weaving progresses according to a regular weaving cycle, inserting a weft thread in a shed formed by one or the other of the sets of warps in accordance with the weaving cycle to form ground, interconnecting the weft threads of both fabrics thus formed by continuous pile forming threads only, severing the pile forming threads to form tufts and then separating the two fabrics while simultaneously pulling the interconnecting portions of the tufts through both fabrics whereby a flat fabric without pile and double faced fabric will be produced.

3. In a process of woven fabric manufacture, the steps which includes weaving a fabric blank which can be separated into four fabrics by providing four sets of superposed warp threads to form grounds and pile forming yarns, shedding each set of warp threads and the pile forming yarn according to a predetermined weaving cycle simultaneously inserting two weft threads in separate sheds formed by either the top and bottom pair of warps or in the two middle pair of warps in accordance with the weaving cycle, simultaneously with the said weft insertions and shedding of warps interconnecting the weft threads of the two upper fabrics in the pile area by pile forming threads only, interconnecting the weft threads of the two lower fabrics in the pile area by pile forming threads only, interconnecting the two upper grounds and the two lower grounds by the same pile forming threads, severing the pile forming threads between the two pairs of grounds to form pile tufts and then separating the upper pair and the lower pair by pulling the interconnecting portions of the tufts through both grounds whereby flat fabrics without pile and a double faced pile fabric will be produced by both the upper pair and the lower pair.

4. In the combination set forth in claim 3 further characterized in that the wefts of the two upper grounds are inserted by the same weft carrier and are continuous, that the wefts of the two lower grounds are inserted by a second weft carrier and are continuous and that these two groups of wefts are severed at the selvages prior to final separation of the fabrics.

5. In the combination set forth in claim 3 further characterized in that some of the warps of the two middle grounds are kept tighter than others throughout the weaving operation.

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