May 15, 1956 G. E. HERRNSTADT 2,745,442

THREE-SHOT AXMINSTER WEAVE

Filed Aug. 30, 1955

FIG. 1.

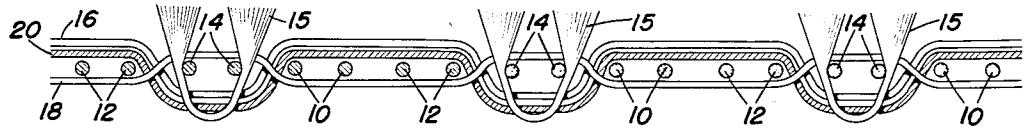


FIG. 2.

	POSITION OF HEDDLES PER CYCLE		
	REAR HEDDLE	MIDDLE HEDDLE	FRONT HEDDLE
1ST SHOT	DOWN	DOWN	UP
2ND SHOT	UP	UP	DOWN
3RD SHOT	UP	UP	DOWN

FIG. 3.

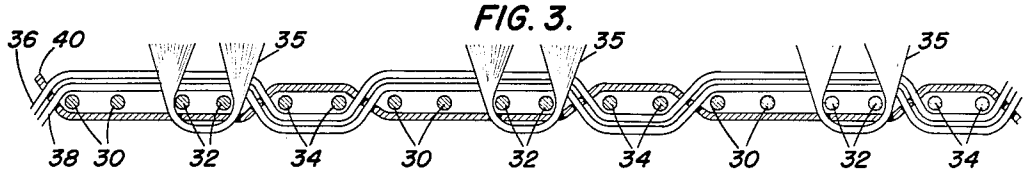


FIG. 4.

	POSITION OF HEDDLES PER CYCLE		
	REAR HEDDLE	MIDDLE HEDDLE	FRONT HEDDLE
1ST SHOT	UP	DOWN	DOWN
2ND SHOT	DOWN	UP	UP
3RD SHOT	DOWN	UP	UP

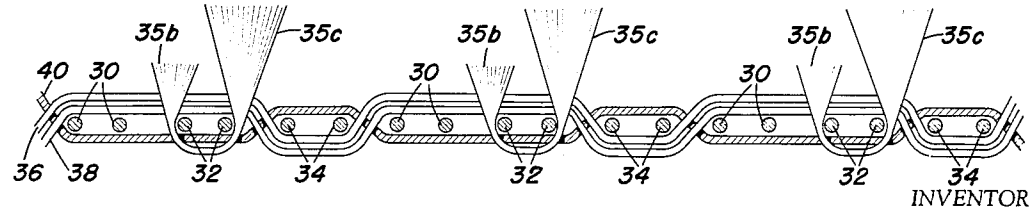


FIG. 5.

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THREE-SHOT AXMINSTER WEAVE

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5 Claims. (Cl. 139—399)

The present invention relates to Axminster carpets and has for its object the provision of a three-shot Axminster weave of novel construction with particular advantages.

The principal object of the invention is to provide a modified form of Axminster weave in which a warp end of suitable material is so tensioned and arranged as to run together with or parallel to the chain warp so as to permit the loop portions of the pile tufts to come through the back in a manner easily achieved on standard Axminster looms.

In common with Axminster weaves, the modification of this invention involves the use of three double weft shots to one face row, but differs therefrom in that pairs of double weft shots are bound under two warp ends extending together, and above a single warp end, with the pile tufts preferably looped under a double weft shot of each pair of such shots, or alternatively under the single double weft shots intermediate said pairs.

The projection of the loops of the tufts into the back has dual advantages under present carpet manufacture where additional stability is imparted to a carpet by the use of special types of sizing materials. Where the tuft does not come through the back, as is the case with the commonly known rib or flat back Axminsters, a larger amount of sizing is used to fill the space between the double weft shots which form the visible back, and in many cases a permanent locking of the tufts is not attained in this manner. With the tuft coming through the back and also being tied in between the second and third weft shots without interference from downward or upward moving warp ends, the back sizing is enabled to enter the looped or U-part of the tuft up to the point where the second and third double weft shots would come together. In previously known Axminster type weaves wherein the tufts come through the back, it is practically impossible to avoid the effect of a ribbed type back. Although flat backs have been obtained in Axminster weaves in various ways, none of these, so far as known, has achieved that result by having a tuft come through the back. With the weave of the present invention the U-shaped portion of the face tuft can be used to lift the third double weft shot to an extent that the base of the tuft will lie in the same plane as the first and second double weft shots, thus producing a flat back.

It is a further object of the invention to avoid undue thickness of the backing by having all the double weft shots lie in substantially the same plane and thereby avoid the necessity for removing a portion of the bottom of doors so that the same can swing freely, but at the same time permit undesired entrance of outside air.

A further and general object of this invention resides in the provision of an Axminister weave of the character described that has a chenille type appearance by reason of the fact that the U-shaped pile tufts stand up in a row as evenly as does the caterpillar of the woven chenille carpet.

By utilization of a broad, U-type, spread tuft the important advantages of superior face yarn coverage in Axminster weaves is obtained.

It will now be understood that an outstanding advantage of the present invention is the large saving through efficient utilization of face yarn. The common and prevalent practice of producing pile fabric floor coverings by punching threads through a previously woven backing involves a great waste of face yarn to produce a hooked or punched rug effect, which through the teachings of this invention is obtainable with much less face yarn on a standard Axminster loom in which the back is woven and the face yarn inserted simultaneously.

The foregoing and other objectives and advantages of this invention will be more clearly understood from the following detailed description of illustrative embodiments thereof, when taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a warpwise section of a three-shot Axminster weave with cut pile;

Fig. 2 is a table of heddle positions for the weaving cycle utilized in producing the fabric of Fig. 1;

Fig. 3 is another warpwise section of a fabric embodying the weave construction of this invention modified as to the position of the pile tufts;

Fig. 4 is a table of heddle positions of the weaving cycle used in producing the fabric of Fig. 3; and

Fig. 5 is a modification of the weave construction of Fig. 3 in which the warpwise section has been varied only by substitution of pile tufts with legs of unequal height.

The weave of Fig. 3 is the preferred embodiment of the invention, for reasons which have been mentioned and will be more fully explained. However, the weaves of Figs. 1 and 3, respectively, have in common spaced pairs of double weft shots and single intermediate double weft shots, all lying in substantially a common plane and having a pile yarn end looped under every third double weft shot, with two sharp ends running together over each of said pairs of double weft shots and under each of said intermediate double weft shots, and a single warp end extending under each of said pairs of double weft shots and over each single doubt weft shot. The single warp end preferably will be a binder warp and the other two warp ends which run together in parallelism will be a chain warp and a warp of stuffer material, respectively.

With reference to the drawings, Fig. 1 shows in detail a three-shot Axminster carpet weave having three closely spaced double weft shots **10**, **12** and **14** disposed in coplanar relation with a U-shaped pile tuft **15** looped under every third double weft shot **14**.

The procedure followed in weaving the fabric of Fig. 1 is indicated in the table of Fig. 2 which tabulates the heddle positions per cycle. In the first shot the rear and middle heddles are down and the front heddle is up; in the second shot both the rear and middle heddles are up and the front heddle is down; and in the third shot both the rear and middle heddles remain up and the front heddle remains down.

It will be especially noted with respect to the weave of Fig. 1 that the pile tufts **15** are looped under the single double weft shots **14** that space the pairs of double weft shots **10** and **12**. Note is to be made also that the warp end **18** lies back of the pile tufts **15** and that the parallel running warp ends **16** and **20** are behind the warp end **18**.

In the preferred weave of Fig. 3 there are three double weft shots, **30**, **32** and **34**, arranged in a substantially common plane with a pile tuft **35** looped under every third double weft shot **32**, which in this instance, however, is one of the double weft shots of the pairs, **30** and **32**, that are bound in the weave together and spaced by the single double weft shots **34**. In this weave two warp ends **36** and **38**, which are respectively a chain warp and a warp of stuffer material, extend together over each

of said pairs of double weft shots 30 and 32 and under each of said intermediate single double weft shots 34, and the weave is completed by a single warp end 40 in the form of a binder warp extending under each of said pairs of double weft shots 30 and 32 and over each single double weft shot 34.

In this weave the parallel running warp ends 36 and 38 lie behind the tufts 35 and in front of the warp end 40.

The weaving cycle for the weave construction of Fig. 3 is shown in the table of Fig. 4. In the first shot the front double heddle is down, the middle heddle is down, and the rear heddle is up; in the second shot both the front and middle heddles are up and the rear heddle is down; and in the third shot the front and middle heddles remain up and the rear heddle remains down, and the pile tuft loops 35 are inserted.

As in the weave of Fig. 1, the loop portions of the pile tufts 35 actually lie on approximately the same level as the adjacent horizontal run of the binder warp 40.

In Fig. 5 the weft shots and yarn ends have the same reference numerals as in the weave of Fig. 3, because the two weaves are substantially the same, differing only in the unequal legs 35*b* and 35*c*, of which 35*c* has the greater height.

It has been explained that for clarity of illustration the loop portions of the U-shaped pile tufts of the several weaves of Figs. 1, 3 and 5 have been shown as lying above or below the adjacent warp ends that underlie the corresponding double weft shot, while in fact they are approximately coplanar in the back side of the carpet. The actual fabric is of course of tightly woven construction instead of loosely put together as the extended sectional views might be considered to show. The manner of locking the tufts and completing the back through the use of commercially employed sizing materials of rubber and similar character has been previously described herein, the showing of these materials having been omitted for clarity.

In the fabrics described herein the wefts may be of jute or the like, the binder and the chain warps may be of cotton or linen, and the other warp end may be of cotton or like material. The pile yarns may be of regular hard twist yarns, balanced twist yarns, nubby yarns, novelty slub yarns, and various combinations of these used to produce regular, pattern, and other effects.

The special advantages of the Axminster carpet weave of this invention reside in the fact that it is readily producible on a standard Axminster loom, it permits the tufts to come through the back for interlocking and anchoring with the back sizing, a flat back of good strength and unobjectionable thickness is obtained, good pile yarn coverage results, and the chenille type appearance produced is superior by reason of the even manner in which the U tufts stand up in the rows.

It will be understood by those skilled in the art to which this invention pertains that various changes and modifications can be made in the preferred embodiments that have been illustrated and described, without departing from the principles of the invention and the scope of the appended claims.

Having thus described my invention, what I claim as novel and desire to secure by Letters Patent of the United States is:

1. A three-shot Axminster carpet weave comprising a plurality of spaced pairs of double weft shots and a single double weft shot intermediate said pairs and all lying in substantially the same plane, a pile yarn end looped under every third double weft shot, two warp ends extending together over each of said pairs of double weft shots and under each of said intermediate single double weft shots, and a single warp end extending under each of said pairs of double weft shots and over each single double weft shot.

2. A three-shot Axminster carpet weave comprising a plurality of spaced pairs of double weft shots and a single double weft shot intermediate said pairs and all lying in substantially the same plane, a pile yarn tuft looped under every single double weft shot, two warp ends extending together over each of said pairs of double weft shots and under each of said intermediate single double weft shots, and a single warp end extending under each of said pairs of double weft shots and over each single double weft shot.

3. A three-shot Axminster carpet weave comprising a plurality of spaced pairs of double weft shots and a single double weft shot intermediate said pairs all lying in substantially the same plane, a pile yarn end looped under every third double weft shot, a chain warp end and an end of stuffer warp material extending together over each of said pairs of double weft shots and under each single double weft shot, and a binder warp extending under each of said pairs of double weft shots and over each single double weft shot.

4. A three-shot Axminster carpet weave comprising a plurality of pairs of double weft shots and a single intermediate double weft shot all closely spaced and lying in substantially the same plane, a U-shaped pile yarn tuft looped under every third double weft shot, a plurality of warp ends extending together over each pair of adjacent double weft shots and under each intermediate double weft shot, and a binder warp extending under said pairs of double weft shots and over each intermediate double weft shot, said pile yarn tufts being looped under the same positioned double weft shot of each of said pairs of double weft shots.

5. The combination of claim 4 in which the U-shaped tufts have legs of unequal height.

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