June 19, 1951 P. MILLER 2,557,453

METHOD OF FORMING AXMINSTER FABRIC

Original Filed Feb. 18, 1949

Fig. 1.

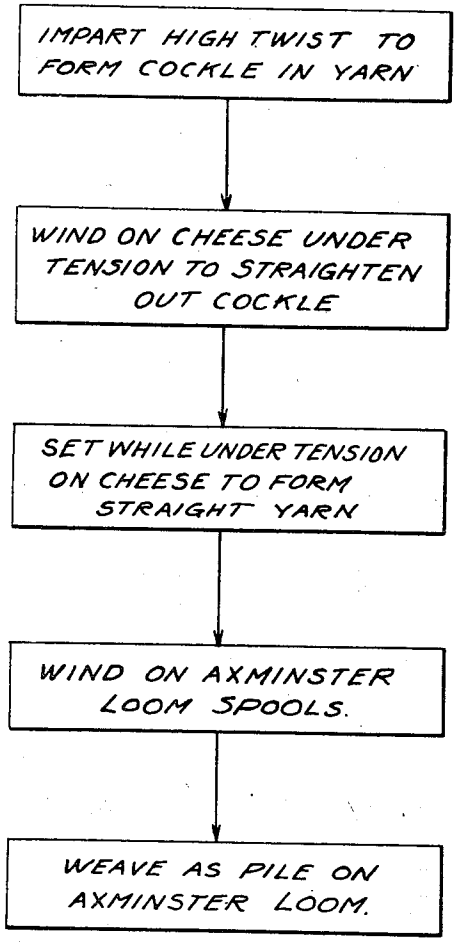
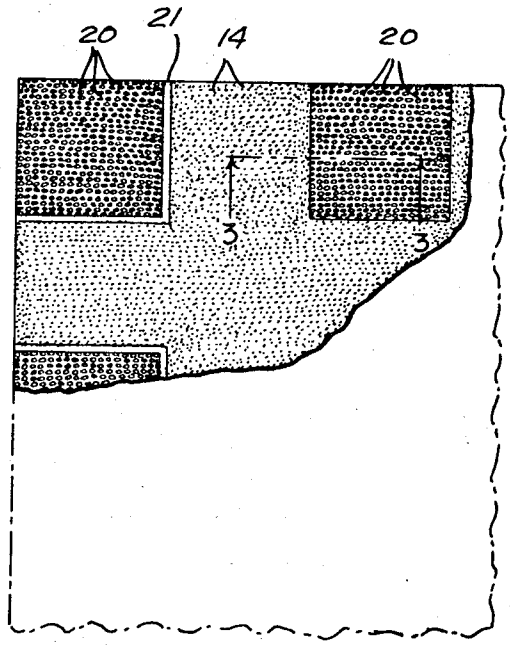


Fig. 2.



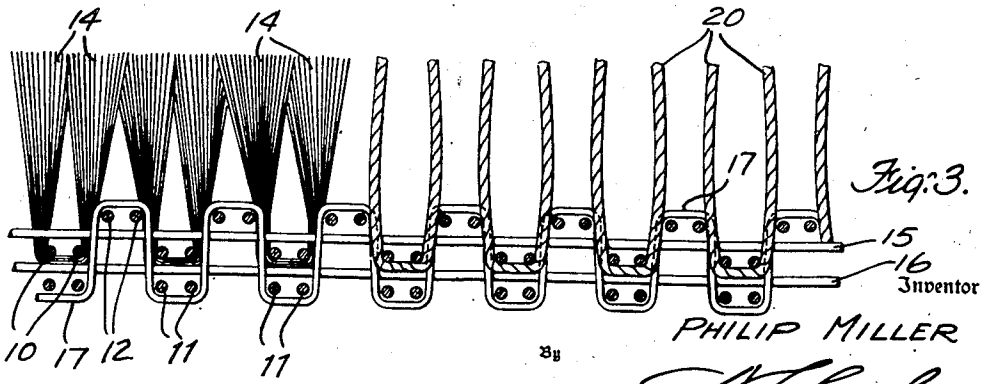


Fig. 3.

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METHOD OF FORMING AXMINSTER FABRIC

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1 Claim. (Cl. 28—76)

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This invention relates to pile fabric, such as rugs or carpets, for floor covering and more particularly to an Axminster weave in which a design is formed by a combination of pile yarns having different degrees of twist.

This application is a division of my co-pending application Serial No. 77,103 filed February 18, 1949.

An object of the invention is to produce an Axminster weave having a sculptured appearance with pile of uniform height.

Another object is to provide a method of weaving high twist pile on an Axminster loom.

Another object is to provide a novel and improved method for forming a design in an Axminster floor covering.

Another object is to provide an Axminster weave having a novel and improved appearance.

Various other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

It has heretofore been impractical to weave highly twisted frieze yarn, that is twisted to an extent to cause a cockle in the yarn, as pile on an Axminster loom because the yarn ends protruding from the tubes of the loom spools must be sufficiently straight to pass between the warp as the spools are brought into weaving position. The cockled frieze yarn tends to curl over on the warp or into the space between neighboring warp instead of entering the proper warp spaces. This has been a limiting factor in selecting pile yarn for such looms.

The present invention avoids this difficulty and makes it possible to weave highly twisted yarns either as the background or as the pattern in combination with the less highly twisted yarns to produce a contrast when both yarns are of the same color and the pile are all of the same height.

More specifically the highly twisted yarn is first wound on cheeses or spindles under a sufficient tension to straighten out the cockle and, while held under tension, the cheeses are treated to set the twist. The yarn then remains straight after the tension has been relieved and may be set and wound on the loom spools and woven on Axminister looms in the usual manner.

In the finished fabric the highly twisted yarn retains its hard, compact finish while the less highly twisted pile tufts spread out to form a more complete covering. The contrast between the soft, uniform appearance of the latter pile tufts with the hard pebbled appearance of the

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hard twist areas produces a sculptured appearance.

The novel features of the invention will be better understood from the following detailed description taken in connection with the accompanying drawings in which a specific embodiment has been set forth for purposes of illustration.

In the drawings:

Fig. 1 is a flow diagram illustrating the steps in the process;

Fig. 2 is a plan view of a portion of a typical floor covering embodying the invention; and

Fig. 3 is an enlarged vertical section through a finished fabric taken on the line 3—3 of Fig. 2.

Referring to the drawings more in detail, Fig. 3 illustrates a typical Axminster weave which includes three double weft or filler shots 10, 11, and 12 for each row of pile tufts 14, two stuffer yarns 15 and 16, and a chain yarn 17. It is to be understood that the weave may be varied as in standard Axminster practice and that a specific arrangement has been shown for purposes of illustration only. In any case the weave is characterized by groups of three double filler shots and a suitable number of stuffer yarns and chain yarns to bind the rows of tufts. In accordance with standard practice the pile yarns are set on an Axminster setting frame in accordance with the selected design and the yarns for the various pile tufts of each row are wound on separate spools having tubes from which the ends project for weaving. After a row of tufts has been woven into the backing, the ends are cut and the next spool is brought into weaving position.

In accordance with this invention the high twist yarns and the low twist yarns are wound on the spools to form the patterns. The low twist or soft yarns are formed in the usual manner. The high twist yarns are formed by the steps indicated in Fig. 1. The yarns are first twisted on the spinning frames to impart a twist of 5 to 10 turns per inch, depending upon the size of the yarn, sufficient twist being given to cause the yarn to tend to cockle or curl when the tension is relieved. For example, in a wool pile yarn of approximately 600 yards per pound seven turns per inch may be used.

The yarn is then wound in packages (cheese or spindle) under sufficient tension to straighten out the cockle or curl and the package is then placed in a steam vessel where it is subjected to saturated steam at elevated pressure, i. e. 30 pounds per square inch until the twist has set so that the yarn retains its straight, hard twisted

form when the tension is relieved. The yarn may be dyed either on the cheese or in skein form while still held under tension.

This high twist set yarn is then wound on the loom spools and woven in the usual manner on the Axminster loom. The resultant fabric includes low twist tufts **14** and high twist tufts **20**, as shown in Fig. 3. The low twist tufts **14** spread out over the surface as indicated to form the usual soft background coverage. The high twist tufts **20** retain their twisted form to produce a pebbled effect which contrasts with the full coverage effect of the low twist tufts.

The effect of this combination is illustrated in Fig. 2 wherein the low twist pile **14** constitutes the background and the high twist pile **20** the design. Obviously these elements could be reversed.

In order to set off the design in a more distinctive manner, a row of tufts may be omitted around the border of the design. The contrasting yarns may have the same degree of twist, but the soft yarns may be unset while the hard yarns are twist set to produce the contrasting effect. The twist in this case must not produce cockle in the unset or soft set yarns.

The above described fabric may be made with any selected design and produce a novel and pleasing appearance simulating sculptured effects. Of course contrasting colors may be used if desired.

The invention is not restricted to the specific form shown, but may be applied to various uses as will be apparent to a person skilled in the art.

What is claimed is:

The method of making a pile fabric which comprises spinning a yarn with a twist sufficiently high to cause the yarn to cockle or curl when its tension is relieved, winding said highly twisted yarn onto packages under a sufficient tension to straighten out the cockle or curl, treating the package in a closed vessel with saturated steam at elevated pressure until the twist has set so that the yarn retains its straight hard twisted form after its tension is relieved, winding said twist set yarn and soft unset yarn in selected combinations on Axminster loom spools and weaving the same as pile on an Axminster loom to form an Axminster weave having selected areas of soft tufts and other selected areas of twist-set tufts.

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