

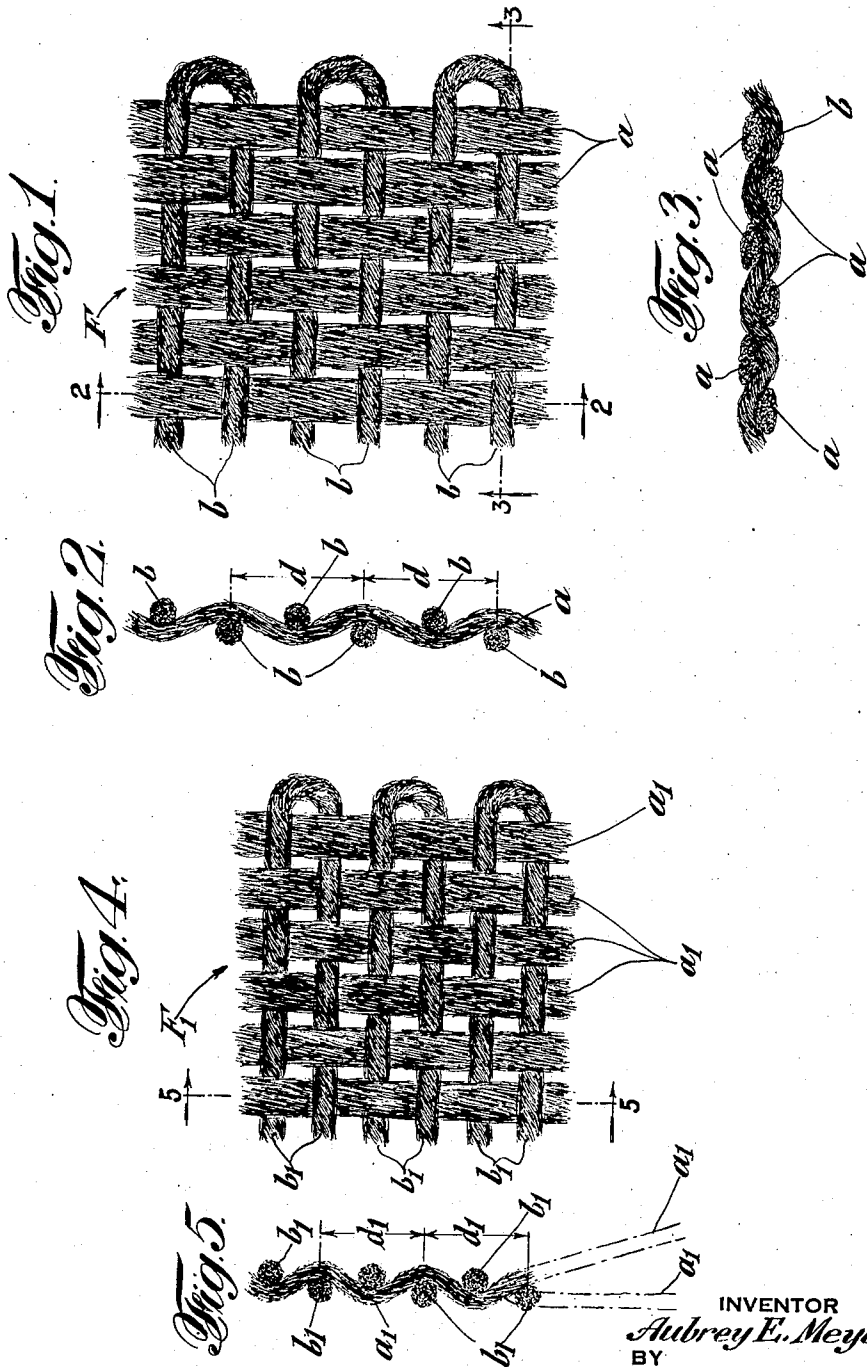
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TEXTILE FABRIC AND ART OF FORMING IT

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TEXTILE FABRIC AND ART OF FORMING IT

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My invention relates to the art of manufacturing or forming textile fabrics.

My invention relates particularly to textile fabrics of the interlaced strand type, as those whose strands are interlaced one with the other such, for example, as woven fabric, or fabric whose strand is interlaced on itself as, for example, knitted fabric, etc.

Various objects, characteristics and features of my invention will become apparent from the following description taken in connection with the accompanying drawing.

My invention resides in the art, fabrics, improvements and features of the character hereinafter described and claimed.

For an understanding of my invention, reference is to be had to the accompanying drawing, in which:

Figure 1 is an enlarged plan view of a prior art fabric;

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1 and looking in the direction of the arrows;

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1 and looking in the direction of the arrows;

Fig. 4 is an enlarged plan view of fabric constructed in accordance with my invention; and

Fig. 5 is a horizontal sectional view taken on the line 5—5 of Fig. 4 and looking in the direction of the arrows.

In Fig. 1, there is illustrated a fabric section F of the interlaced strand type and formed of the warp or longitudinal strands *a* and the weft, cross-wise or filling strands *b*. The strands *b* are formed from fibrous, twisted yarn and the strands *a*, usually, from fibrous, gummed detwisted yarn such, for example, as described in my U. S. Letters Patent No. 1,295,821, granted February 25, 1919, for textile yarn and method of making the same and more specifically as described in my pending application Serial No. 740,841, filed September 30, 1924, for method of preparing textile yarn, and the resulting products.

Yarn of the character described in the aforesaid patent and application may be spun in the usual manner from sliver, roving, etc., and have the necessary twist to permit han-

dling and gumming. After the twist has been imparted thereto, the yarn is suitably gummed with a yarn sizing starch solution, for example. Then, in accordance with the aforesaid patent, the yarn is suitably detwisted to a desired degree after the gum is dry. Or, in accordance with the aforesaid application, the yarn is suitably detwisted either after the gum thereon has been suitably moistened, or the gum on the yarn is moistened after the detwisting operation. In either event, the yarn, when prepared in accordance with the aforesaid application, has greater uniformity of detwist, usually, than when prepared in accordance with the aforesaid patent.

After the detwisting operation and with the gum on the yarn dry, the yarn is utilized for forming suitable fabric such, for example, as illustrated in Fig. 1, where, as stated, the longitudinal strands *a* are formed from yarn of the character described in my aforesaid patent or application.

Due to the presence of the gum on the yarn strands *a*, it results that, to greater or less extent, they are non-flexible or non-pliable. Or, as will be clearly understood, such yarn strands *a* are not as flexible or pliable as twisted yarn strands without gum thereon.

Accordingly, during the weaving operation and to produce the fabric F of Fig. 1, the longitudinal strands *a*, due to their above described non-flexible or non-pliable character, tend to and do take an undulating form such as illustrated, for example, in Fig. 2. As there shown, the distance *d* between adjacent crests of a longitudinal strand *a* is relatively great whereby the cross-wise strands *b* are spaced relatively great distances from each other.

In accordance with my invention and by a suitable operation, the flexibility or pliability of the gummed, detwisted yarn strands is increased to a suitable degree whereby the distance *d*1, Fig. 5, between adjacent crests thereof is decreased compared to that shown in Fig. 2.

Thus in Fig. 4, the fabric F1, in correspondence with the fabric F of Fig. 1, is

formed of the warp or longitudinal strands $a1$ and the weft, cross-wise or filling strands $b1$. In Fig. 4, however, the cross-wise strands $b1$ are shown as spaced closer together than in Fig. 1 and, as shown in Fig. 5, the distance $d1$ between adjacent crests in any lengthwise strand $a1$ is closer than in Fig. 2. This result is obtained due to the fact that the yarn strands $a1$ are more flexible or pliable than the strands a and, accordingly, they are more readily and sharply bendable with respect to the cross-wise strands $b1$ during the weaving operation.

The gummed, detwisted yarn strands $a1$ may be rendered more flexible or pliable in any suitable manner and in many different ways. Thus, for example, a moistening or wetting roller may be disposed in contact with the fabric $F1$ to the rear of the "fell" or that fabric edge being built up by the cross-wise strands $b1$ under the action of the shuttle. This roller, then, contacts with the fabric after incorporation of the cross-wise strands $b1$ therein and, in part by capillary action, wetness or moisture is transferred to the gummed, detwisted yarn strands $a1$, particularly just beyond the region of incorporation whereby the gum thereon is softened and said last named yarn strands rendered more pliable and flexible. Obviously, in lieu of a roller, a suitable form of sprinkling or dripping device may be utilized for imparting moisture to the gummed, detwisted yarn strands $a1$. Or, if desired, the cross-wise yarn strands $b1$ may be moistened prior to use and, while moist, incorporated with the gummed, detwisted yarn strands $a1$, moisture or wetness being transferred to said last named yarn strands $b1$ to render them more pliable or flexible. Further, if desired, a moisture-carrying member, as a sponge, may be moved back and forth across the fabric near the aforesaid "fell." As stated, the desired result may be attained in many different ways and it is to be distinctly understood that my invention is not to be limited to the examples given.

Where the gummed, detwisted yarn strands $a1$ are rendered flexible or pliable, they readily take, during the weaving operation, a configuration such as shown in Fig. 5, for example. As a result, the number of cross-wise strands $b1$ per unit distance may be increased beyond that shown in Fig. 1 and may be, for example, as shown in Fig. 4. By thus increasing the number of cross-wise strands $b1$, the appearance or texture together with the weight of the resultant fabric may be developed in a desired manner while preserving the desirable fabric characteristics arising by virtue of the use of gummed, detwisted yarn strands. Somewhat in a secondary sense, the wearing qualities and strength of the fabric are improved.

As is well understood in the weaving art, suitable mechanism is utilized for determining the number of cross-wise strands which the completed fabric is to have per unit distance. Where the longitudinal strands are of the character shown in Fig. 1 and not moistened, the aforesaid mechanism may be set to cause the disposition in the fabric of a certain number of cross-wise strands. However, due to the lack of pliability of the longitudinal strands, it may prove impossible to space the cross-wise strands sufficiently close to obtain the desired number per unit distance even though said mechanism is set with that end in view. In accordance with my invention, however, the desired result may be attained, namely, disposition of a certain number of cross-wise strands in the fabric, since the pliability of the longitudinal strands is increased to permit the desired close spacing of said cross-wise strands.

It shall be distinctly understood that my invention is not to be limited to the utilization of longitudinal strands formed from gummed, detwisted yarn and cross-wise strands formed from twisted yarn. If desired, this condition may be reversed; that is, the longitudinal strands may be formed from ordinary twisted yarn and the cross-wise strands from gummed, detwisted yarn, the latter being suitably treated in accordance with my invention to render them more pliable or flexible. Still further, it shall be understood that both the lengthwise and cross-wise yarn strands may be formed from gummed, detwisted yarn.

Further, it shall be understood that my invention is not to be limited to any fabric of a particular type and, still further, fabrics other than interlaced fabric may be produced in accordance with my invention.

Where knitted fabric is produced in accordance with my invention, the gummed, detwisted yarn may be rendered more pliable or flexible in any suitable manner. With knitted fabric, said gummed, detwisted yarn may be moistened or wetted before incorporation in the fabric and this is also true, if desired, with fabric of the character shown in Fig. 4.

In this application, the terms "gum" or "gummed" shall be understood as having the meaning set forth in my aforesaid patent and/or application.

Ordinarily, my invention relates to the art of increasing the flexibility or pliability of gummed, detwisted yarn. It shall be understood, however, that the purview of my invention is sufficiently comprehensive to include yarns which have not been detwisted and are only slightly if at all twisted since, with such yarns, the fabric effect is substantially the same as exists where the

yarn is twisted and then detwisted to a desired degree.

While the invention has been described with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. In the textile fabric art, the step which consists in forming a fabric in part at least from detwisted yarn having gum thereon in moist or tacky condition during the fabric-forming operation whereby the fabric includes a greater number of strand sections per unit of distance than would be the case if the gum on said detwisted yarn was dry during the fabric-forming operation.

2. A textile fabric formed in part at least from gummed, detwisted yarn, the gum on said yarn being moist or tacky during the fabric-forming operation whereby the flexible or pliable character of said yarn is increased so that the fabric includes a greater number of strand sections per unit of distance than would be the case if the gum on said detwisted yarn was dry during the fabric-forming operation.

3. A textile fabric of the interlaced strand type wherein the strands extending in one direction are formed from gummed, detwisted yarn, the gum on said yarn being moist during the fabric-forming operation whereby the flexible or pliable character of said yarn is increased so that the fabric includes a greater number of strands per unit of distance at right angles to said one direction than would be the case if the gum on said detwisted yarn strands was dry during the fabric-forming operation.

4. In the art of producing textile fabrics wherein the strands extending in one direction of the fabric are formed from gummed, detwisted yarn, the step which consists in having the gum on said detwisted yarn strands moist during the fabric-forming operation whereby the fabric includes a greater number of strands per unit of distance at right angles to said one direction than would be the case if the gum on said detwisted yarn strands was dry during the fabric-forming operation.

5. In the art of producing textile fabrics wherein the longitudinal or warp strands are formed from gummed, detwisted yarn, the step which consists in having the gum on the detwisted yarn strands moist during the fabric-forming operation whereby the fabric includes a greater number of crosswise or weft strands per unit of distance than would

be the case if the gum on said detwisted yarn strands was dry during the fabric-forming operation.

6. A textile fabric of the interlaced strand type wherein the longitudinal or warp strands are formed from gummed, detwisted yarn and the crosswise or weft strands are formed from ordinary twisted yarn, the gum on said detwisted yarn being moist during the fabric-forming operation whereby the flexible or pliable character of said detwisted yarn is increased so that the fabric includes a greater number of crosswise or weft strands per unit of distance than would be the case if the gum on said detwisted yarn strands was dry during the fabric-forming operation.

In testimony whereof I have signed my name to this specification.

AUBREY E. MEYER.