Dec. 22, 1936. L. HAMER 2,065,309

ORNAMENTAL WOVEN FABRIC

Filed Nov. 5, 1935

Fig. 1

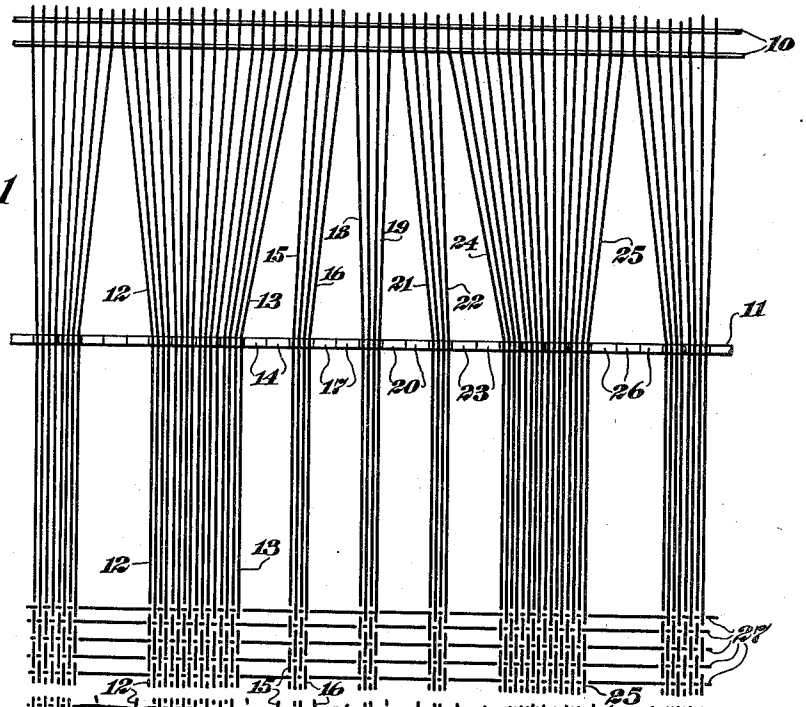


Fig. 2

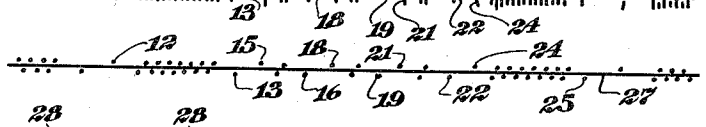


Fig. 3

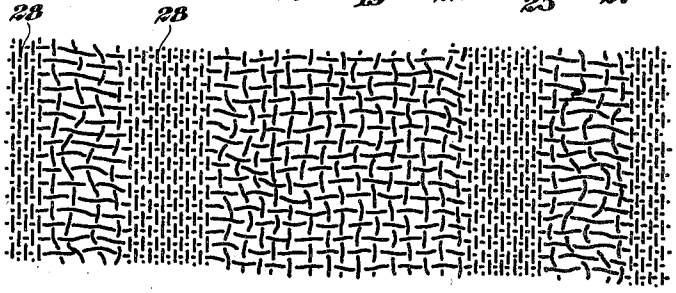
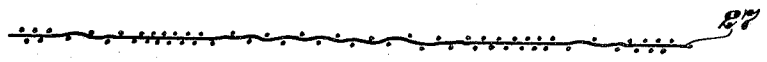


Fig. 4



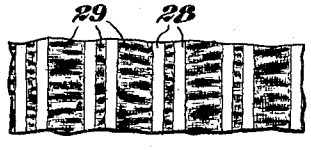


Fig. 5

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ORNAMENTAL WOVEN FABRIC

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Application November 5, 1935, Serial No. 48,263

3 Claims. (Cl. 139—417)

My present invention relates generally to the weaving art, and has particular reference to a new type of ornamental woven fabric and a method for making the same.

A general object of the invention is to provide an ornamental fabric having puckered effects, so that the fabric resembles, in a way, a seersucker type of cloth. A more particular object is to provide such a fabric without the necessity of resorting to the relatively complicated and expensive methods which have heretofore been employed for this purpose. Usually, puckers or crepe effects are achieved by employing two beams or two different tensions, or by the use of specially twisted yarn, or by using box-looms. The present fabric can be produced on a plain or dobby loom, using a single warp beam, a single tension, and without recourse to any specially twisted yarn.

My invention is predicated upon the discovery that, by weaving the fabric, at least in part, with swellable yarn, and by sleying or reeding the threads in a particular manner, unique novel effects may be produced. The fabric is admirably adapted for use in the manufacture of linings, draperies, dress goods, underwear fabrics, bedspreads, and similar materials. One of the outstanding advantageous features of the present fabric lies in the fact that it has a minimum tendency to crease or crush in wear. Furthermore, it will not sag, whereas objectionable sagging or stretching is characteristic of ordinary fabrics produced by the usual methods of crepe twisting of yarn or the employment of the two-tension principle. Moreover, the present fabric need not be ironed after it is washed.

By the term "swellable yarn" I intend to refer to any type of yarn which has the characteristic of expanding or swelling when it is subjected to a wetting. Among the yarns which meet this requirement are most of the synthetic yarns such as rayon, cuprammonium, nitrocellulose, or viscose. The yarn which is employed in the manufacture of the present fabric is not of a specially twisted character but may have, for example, approximately two and one-half turns per inch.

The unique effects which I achieve are the combined result of the type of yarn which is used, and the manner in which it is reeded in the loom. In the weaving, I produce predetermined spaced areas of very closely woven texture, and intermediate areas of relatively loose-woven texture. Because of the reeding which I resort to, the contraction in the dense areas results from a sinuosity of the threads in planes transverse to the fabric, whereas the threads in the intermediate loosely woven areas partake only partially of the transverse sinuosity and have a marked degree of waviness in the plane of the fabric itself. The ultimate result is that the swellable yarn in the loosely woven regions becomes swollen or expanded (when the fabric is subjected to the finishing or washing procedure) to a greater extent than the yarn in the dense areas. This produces a puckered effect of unusual character.

I achieve the foregoing objects, and such other objects as may hereinafter appear or be pointed out, in the manner illustratively exemplified in the accompanying drawing, wherein—

Figure 1 is a diagrammatic plan view showing one way of producing a fabric of the present character;

Figure 2 is an enlarged cross-sectional view taken substantially along the line 2—2 of Figure 1;

Figure 3 is a plan view of the fabric shown at the bottom of Figure 1 after the finishing process;

Figure 4 is an enlarged cross-sectional view taken substantially along the line 4—4 of Figure 3; and

Figure 5 is a plan view on a true scale of a portion of the fabric thus made.

Inasmuch as it will be understood that wide variations in design are possible, the particular ornamental fabric which I have chosen to illustrate herein is merely typical and is illustrated and described in detail merely for the purpose of explaining the general nature of my invention. I have chosen to illustrate a fabric in which all of the warp threads are of swellable yarn. These are the threads arranged in substantially vertical directions in Figure 1. The weft or filler threads are also composed of swellable yarn, but it will be understood that all the threads of the fabric need not necessarily be of this character.

At 10 I have diagrammatically illustrated the heddles through which the warp threads are threaded as they are drawn from a single warp beam at the rear of the loom (not shown). At 11 I have shown the reed, and in Figure 1 twenty-nine dents are shown. A fuller appreciation of the exaggerated and enlarged nature of Figure 1 will be had when I state that the illustrated fabric is in actual practice formed on a loom in which the reed has forty-six dents per inch. The entire width of Figure 1, therefore, represents less than an inch of the reed 11 and of the other corresponding parts. Accordingly, the distance between the heddles 10 and the reed 11 is greatly foreshortened in Figure 1 which, as hereinbefore

stated, is intended to be purely diagrammatic.

In the particular weave illustrated, a reeding of four warp threads per dent is employed. The sixteen threads between those designated 12 and 13 are passed through four dents, thus forming a compacted group. Two dents 14 are then left empty. The four threads between those designated 15 and 16 are then passed through the next dent, forming a compacted group, and two more dents 17 are left empty. Four more threads, between those marked 18 and 19, forming another compacted group, are then threaded through a dent, and two dents 20 are left empty. Four more, between those marked 21 and 22, are reeded together in a group, and the dents 23 are left empty. Another compacted group of sixteen threads, lying between those marked 24 and 25, is then passed through four successive dents, and then three dents 26 are left empty. The pattern is then repeated.

Notwithstanding the formation of the so-called "groups" mentioned in the preceding paragraph, it will be observed that the threads are worked individually by the harness.

It will be noticed that a total of forty-four threads has been reeded through a total of twenty-two dents. Ordinary practice would relegate two threads to each dent, for the purpose of producing a uniform cloth. The unique effect of reeding the threads in the manner hereinbefore described will be presently set forth.

The reference numeral 27 is applied to the filler threads which, as will be understood by those skilled in the art, are successively shot across the loom by means of the shuttle, and are then beaten down by reciprocal movements of the reed 11.

The weaving thus accomplished produces the result shown in the lower portion of Figure 1, in which it will be observed that certain of the warp threads have fallen sideways out of their original position. Thus, the threads 12 and 13 at the opposite ends of the first-mentioned original compacted group of sixteen have fallen away from the rest of the group, and partake of a sinuosity in the plane of the fabric. The same effect will be observed with respect to the threads 15 and 16, on opposite sides of the corresponding originally compacted group of four previously described. A similar effect will be observed with respect to threads 18, 19, 21, 22, 24, and 25.

The reason for this lateral dislocation of these threads is that the particular method of reeding the threads has left empty spaces between successive original groups, and the marginal threads fall over quite naturally into these spaces. Since the contraction of all the warp threads is, however, uniform, it is obvious that the threads which have fallen over into the empty regions will have a sinuosity or waviness in the plane of the fabric; while the threads remaining in the compacted areas restrict their sinuosity to planes transverse to the fabric.

The ultimate result is that the twelve threads lying between the threads 13 and 24 will ultimately distribute themselves in a loosely woven manner throughout the region which they occupy. This is shown most clearly in Figure 3, which has been purposely drawn upon the same scale as Figure 1, and in which the same reference numerals are applied to corresponding threads. It will be observed that relatively dense areas, represented by the reference numeral 28, remain intact.

When the fabric is finally subjected to a wetting, as in the washing procedure, incident to the finishing of the cloth, the swellable yarn expands, or at least tries to. The yarn in the dense areas 28 does not have the same opportunity to expand as the yarn in the intermediate loosely woven areas. As a result, a waviness, resulting in a puckered effect, is produced in the intermediate loosely woven areas. These areas are designated in Figure 5 by the reference numeral 29.

As hereinbefore stated, many variations in design are possible. The invention is not necessarily restricted to striped effects, but is of particular value and utility where the ornamentation is of a striped variety and where the entire warp of the fabric is composed of swellable yarn of the character mentioned.

In general, it will be understood that changes in the details, herein described and illustrated for the purpose of explaining the nature of my invention, may be made by those skilled in the art without departing from the spirit and scope of the invention as expressed in the appended claims. It is, therefore, intended that these details be interpreted as illustrative, and not in a limiting sense.

Having thus described my invention, and illustrated its use, what I claim as new and desire to secure by Letters Patent is—

1. An ornamental woven fabric in which the warp threads are of uniform character and of equal original lenths, said fabric having predetermined areas of closely woved texture in which said threads are compacted to restrict their sinuosity to planes transverse to the fabric, the warp threads in the intermediate areas being sparsely arranged and having a sinuosity in the plane of the fabric; and said warp threads being composed of swellable yarn, those in said intermediate areas being swollen so as to produce a puckered effect.

2. An ornamental woven fabric in which the warp is composed entirely of swellable yarn, certain warp threads being arranged in original compacted groups of at least four threads each, said groups being separated by spaces which are entirely devoid of warp threads and of sufficient width to permit at least the outer threads of said groups to fall into wavy disposition in said spaces; the fallen warp threads being swollen so as to produce a puckered effect.

3. In an ornamental woven fabric in which the warp is composed entirely of swellable yarn, spaced areas each comprising a compacted group of at least twelve warp threads, the warp threads in the intermediate area being arranged in original compacted groups of about four threads each, said groups being separated by spaces which are entirely devoid of warp threads and of sufficient width to permit at least the outer threads of said groups to fall into wavy disposition in said spaces, the fallen warp threads being swollen so as to produce a puckered effect.

LEWIS HAMER.