Oct. 11, 1927. 1,644,816

G. E. CLAUSS

ELASTIC WEBBING

Filed April 24, 1926

Fig. 1.

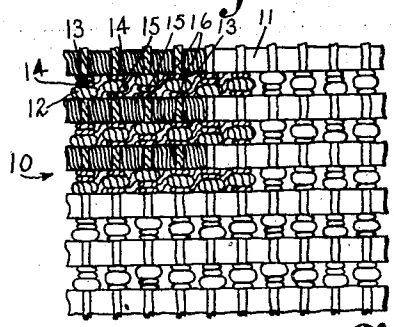


Fig. 2.

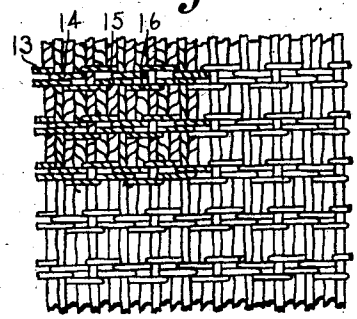


Fig. 3.



Fig. 4.



Fig. 5.

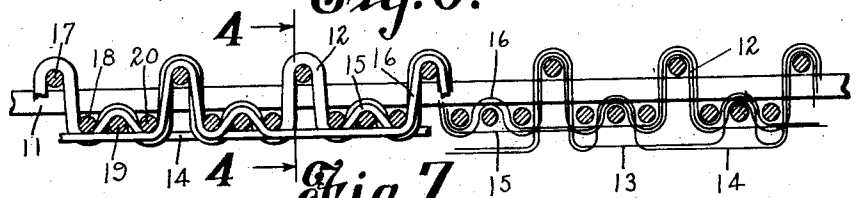
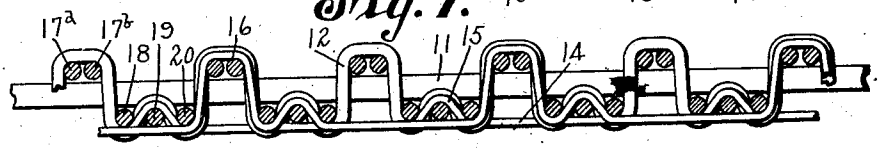


Fig. 7.



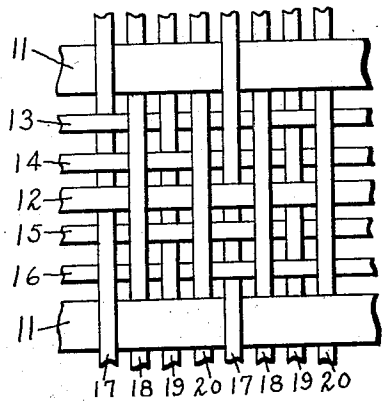


Fig. 6.

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UNITED STATES PATENT OFFICE.

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ELASTIC WEBBING.

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This invention relates to woven fabric material, and more particularly to a woven elastic fabric or elastic webbing, so termed because of the fact that it may be stretched to a considerable extent when under tension, and resume its natural form when the tension is released. This quality arises from the fact that the fabric contains elastic or rubber thread, and in practice this rubber thread is usually covered with one or more layers of textile yarn to provide what is commonly called covered rubber. The invention relates particularly to what is termed in the trade as wide elastic webbing, and as implied by this name, is usually made in relatively wide widths suitable for use in the manufacture of corsets, girdles, abdominal supporters, elastic bandages, or other articles of personal wear. In connection with use in corsets, for example, the webbing is often made of a width equal to the width of the garment and relatively short lengths are inserted between two inelastic sections, so that the elastic web extends from the top to the bottom of the garment to give elasticity to the latter throughout its entire width. It may, however, be cut into V-shaped or wedge shaped sections and be inserted in a corset or girdle in the form of gores.

A web which is suited for use in connection with the articles described, preferably has certain characteristics which render it especially desirable for such use, particularly if all of these desirable qualities may be combined in one fabric, which combination is contemplated by the present invention. Such a web should possess an ornamental face surface; and preferably, as is the case with the present web, a hard reticulated face; a soft, smooth, velvety back surface which is closest to the skin of the wearer; great flexibility so that it may be easily folded or doubled up without deformation and without showing the creases or folds when straightened; proper elastic strength; great ultimate strength; and the parts of the web should be strongly or firmly bound together. I have succeeded in combining all of these characteristics in a web having a single layer of covered rubber cords, although it will be understood that without departing from the invention in its broader aspects, the character of the web may be changed to some extent and even some of the desirable characteristics described above may be omitted.

One object of my invention is to provide a web having a single layer of rubber warp cords of such character that the webbing may be suitable for use in corsets or kindred articles, wherein the web may form the entire body of the article or may be used in sections or gores between inelastic portions of the garments.

Another object of my invention is to provide an elastic webbing having a single range or layer of rubber cords, and provided with an ornamental reticulated face surface, and a soft, smooth back surface.

Another object of my invention is to provide an elastic webbing, having rubber warp cords crossed on the face of the web by filler picks forming ribs which cooperate with the cords to provide face reticules, and having textile warp threads carried for the greater part of their lengths on the back of the web to form part of a soft back surface therefor.

A still further object of my invention is the provision of an elastic webbing, having a single layer of rubber cords, and of strong and durable character, while at the same time possessing great flexibility and having one soft, yielding surface which may be worn close to the skin with comfort.

A still further object of the invention is to provide an elastic webbing of relatively light weight which will, at the same time, be strong and durable, the parts of which will be firmly held together and which, at the same time is pliable and flexible and may be folded and crumpled readily but which will not be easily creased.

A still further object of my invention is to provide an elastic fabric composed of elastic warp cords and textile filler picks and other textile warp cords, the filler picks and the textile warp cords having a greater aggregate cross-section on the back of the web than on the front thereof, and being arranged to form a soft back surface for the web.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is an enlarged plan view of the front face of the web;

Fig. 2 is an enlarged plan view of the back of the web;

Fig. 3 is a diagrammatic sectional view through the warp thread, showing the selvage edge;

Fig. 4 is a cross-sectional view through the warp threads, showing the texture of the web between the selvage edges, taken on line 4—4 of Fig. 5;

Fig. 5 is a longitudinal sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is an enlarged diagrammatic view of the face of the webbing;

Fig. 7 is a view similar to Fig. 5, showing a modified form.

The preferred embodiment of my invention which I have selected to illustrate and describe, consists of a web designated generally by the numeral 10, the face of which, as shown in Fig. 1, is of a reticulated appearance, the reticules being substantially rectangular in shape and formed by the crossing of the textile face filler picks and the elastic warp cords, as will be described more particularly hereinafter. It will be understood that the precise steps described in the weaving of the material may be varied to a considerable extent without changing, except in the matter of degree, the character of the resulting fabric and without departing from the basic principles employed in its construction. In the form shown, the rubber cords and the face filler picks are so spaced as to form reticules rectangular in shape, the dimensions of which may, of course, be varied in the weaving of the fabric if desired.

The web may be regarded as made up of certain units, the warp threads of which, as shown in Fig. 3, consist of a covered rubber warp cord 11, a binder warp thread 12, and four back warp threads 13, 14, 15 and 16, the unit repeating itself many times across the web. These warp threads are crossed by eight filling picks within the unit referred to, the filling picks crossing the warp threads in a certain manner which will be more particularly described later, eight of these crossings forming a cycle which is thereafter repeated throughout the length of the fabric. As shown in Fig. 3, the rubber warp cords 11 are arranged in a single layer or range across the width of the fabric, and are crossed by the face filling picks 17 and back filling picks 18, 19 and 20. The face filling picks 17 form ribs on the face of the fabric, and as shown, are spaced apart to a sufficient extent to form in conjunction with the rubber cords the reticules already referred to. These ribs may consist of a single crossing of filling or they may, if desired, consist of two or more. Such a rib consisting of two crossings of filling picks, is shown in Fig. 7 of the drawings. The filling picks themselves may also consist of one or more threads depending on the size of these picks, which is, of course, determined by the precise character which is desired of the finished product. In any case, however, according to the present invention, the face filling picks will form ribs above the cords to provide the face reticules. It may also be noted that there are more filling picks below the rubber cords than above, which is preferable but which may be varied if desired. In the unit above referred to, it will be noted that there are eight crossings of filling picks arranged in two series of four each, and in each series one filler pick crosses above the rubber cords and three below.

The rubber warp cords and certain of the filling threads are bound together by the binder warp threads 12, arranged as shown in Figs. 3 and 4, substantially intermediate the rubber cords. These binder threads pass over and under alternate filling picks and are so arranged that they pass over all of the face filling picks 17, arranged above the rubber cords. While these binder threads hold the face filling picks down tightly to the rubber cords, an additional binding function is also accomplished by the back warp threads, as will be hereinafter explained.

The back warp threads 13, 14, 15 and 16 serve as a stuffing for the fabric, and are so crossed by the filling threads that the greater part of the length of these warp threads is exposed at the back of the web, these threads being so woven that they, together with the back filling picks, will form a relatively soft and yielding back for the web. The manner in which these threads are crossed by the filling picks is perhaps best shown in Fig. 6. Each of these threads is woven into the web in the same manner, but they are staggered in relation to each other so that while one may pass above a given filling pick, an adjacent one will pass below such pick. The warp thread 13, for instance, passes above the filler pick 17, below the next five filling picks 18, 19, 20, 17 and 18, above the next filling pick 19 and below the next pick 20, this cycle taking in eight crossings of filling picks and being repeated many times throughout the web. The warp thread 14 passes above the first filling pick 17, below 18, above 19 and then below the next five filling picks 20, 17, 18, 19 and 20. The thread 15 in the unit shown passes below the first two filling picks 17 and 18, above 19, below 20, above the next filling pick 17 and then below the next three picks 18, 19, and 20, while the thread 16 passes below the first four picks 17, 18, 19 and 20, above the next 17, below the next 18, above the next 19, and below the last 20. It will be obvious, therefore, that each of these back warp threads passes above one filler pick, under the next, above the next, and then below the next five.

Notwithstanding the fact that these threads are staggered in relation to each other in the units under consideration, it will be seen that each of the face filling picks will be crossed by two of such threads. For instance, the first face pick 17 in the unit shown in Fig. 6, lies below the back warps 13 and 14, while the second face filler 17 lies below the warp threads 15 and 16. It will also be noted that the greater part of the lengths of these warp threads is situated on the back of the web, and as the number of filling picks on the back of the web is greater than that on the face, it will be apparent that there is a greater mass of textile material on the back than on the face of the web, which material is so woven as to form the soft back surface.

The back warp threads 13, 14, 15 and 16, each of which passes over one face filling pick in every unit of eight of such picks, will also serve in part to bind the parts of the fabric together, as well as serving as stuffing warps to add to the body of the fabric.

In each unit, as already described, and as shown in Fig. 6, there are beside one rubber cord, one binder warp thread, four back warp threads, and eight filling picks, the five warp threads and eight filling picks, of course, crossing each other forty times within the unit. Each binder warp thread crosses above four and below four of the filling picks, while each of the four back warps pass above two and below six of the filling picks, and thus in all the warp threads cross above the filling picks twelve times and below twenty-eight times in the unit. Moreover, as each back warp thread passes below five filling picks in sequence, it will be obvious that a considerable part of the warp threads is on the back of the web.

In the preferred embodiment of my invention which is illustrated in the drawings, I have used for the rubber cords, a thread of No. 34 rubber, covered with two layers of cotton yarn. The binder threads are No. 20/2 cotton yarn, preferably mercerized, and the back warp threads are cotton yarn of size 40/2. The filling picks each consist of two threads of cotton yarn of 19/2 size, preferably mercerized, these two threads acting as one and, of course, carried across the web by one movement of the shuttle. Together they are substantially equal to one No. 9½ two-ply thread. I have found that by using threads of the size designated a very desirable web is produced. It will, of course, be understood that considerable variation may be resorted to in this respect without departing from the spirit of the invention.

The selvage edge of my improved fabric may be made in the usual or any preferred manner. As shown in the drawings, it consists of a single outer rubber warp cord 22 between which and the body of the fabric are placed a number of warp threads 23. These warp threads are traversed by the filling picks in the usual way, the latter passing around the cord 22. It will be apparent, therefore, that the rubber warp cords are in a single layer across the entire width of the fabric, including the selvage edge, although I do not necessarily limit myself to this exact construction.

It will also be apparent from Figs. 5 and 6 of the drawings that the back warp threads 13, 14, 15 and 16 pass over and are held by every alternate face rib formed by the face picks 17. As there are two of these ribs and four back warp threads in each unit, each of the ribs will be held to the rubber cords by two of the back warp threads in each unit. As already explained, each unit is also crossed by each binder warp thread.

In Fig. 7 of the drawings, I have shown a web of somewhat modified form in that two face filling picks 17^a and 17^b are used in place of the single pick 17 shown in Figs. 1 to 6. These two picks, however, are adjacent each other and are bunched together to form one rib and may be considered in some respects like one thread, although two distinct movements of the shuttle may be required to produce them. They are crossed as one pick by the warp threads in exactly the same manner that the single face pick is crossed by the warp threads in the other figures of the drawings.

While I have shown and described a preferred embodiment of my invention, it will be understood that it is not to be limited to all the details shown but is capable of modification and variation within the spirit of the invention and the scope of the appended claims. For instance, the number, arrangement and size of the threads and cords may be varied to some extent. If, for instance, the back warp threads were No. 20/2 and were rather loosely twisted, the web would have a back even softer than that described. Such a web might or might not be preferable, according as the opinions of the various purchasers might differ.

What I claim is:

1. Elastic webbing having a single layer of covered rubber warp cords, picks of filling above said cords and spaced apart to form therewith a reticulated face for the web, picks of filling below said cords, and means to bind the aforesaid elements together including a number of warp threads floated on the back surface of the web outside a plurality of adjacent lower filling picks and at intervals passing up and downwardly between two adjacent back picks to go over a face pick and be held thereby.

2. Elastic webbing having a single layer of covered rubber warp cords, picks of filling above said cords constituting cross ribs spaced apart to form therewith a reticulated

face for the web, picks of filling below said cords, and means to bind the aforesaid elements together including a number of warp threads engaging every alternate face rib and being floated on the back surface of the web outside a plurality of adjacent lower filling picks and said warp threads passing downwardly on each side of the face ribs engaged thereby to pass under two adjacent back picks.

3. Elastic web, having a single layer of covered rubber warp cords, face picks constituting cross ribs above said cords and spaced apart to form a reticulated face for the web, back picks of filling below the cords and more numerous than the face picks, binder warp threads engaging the face ribs and back picks, and back warp threads held by certain of the face ribs and floated outside of a plurality of adjacent back picks in one step to be exposed on the back of the web for the greater portion of their lengths.

4. Elastic web, having a single layer of covered rubber warp cords, face filling picks constituting cross ribs above said cords, back filling picks below said cords more numerous than the face picks, binder warp threads passing under and over alternate face ribs and back picks, and other warp threads passing over certain of the filler picks but under and outside a greater number thereof to float on the back of the web and form in conjunction with the back filler picks a soft back surface for the web.

5. Elastic web, having a single layer of covered rubber warp cords, face filling picks constituting cross ribs above said cords, back filling picks below said cords more numerous than the face picks, binder warp threads engaging every face rib, other warp threads engaging every alternate face rib and certain back filling picks, and said cross ribs being spaced apart to form face reticules with the rubber cords.

6. Elastic web, having a single layer of rubber warp cords, face filling picks constituting cross ribs above said cords, back picks of filling below said cords, binder warp threads engaging every face rib and other warp threads engaging every alternate face rib and exposed on the back of the web for the greater portion of their lengths.

7. Elastic web, having a single layer of covered rubber warp cords, face filling picks constituting cross ribs above said cords and spaced apart, back filling picks below the cords and arranged in groups between said ribs, and means to bind the aforesaid elements together including textile warp threads passing upwardly and downwardly between two adjacent back picks to engage every alternate face rib and crossing under and outside of a plurality of adjacent back picks in one step.

8. Elastic web, having a single layer of covered rubber warp cords, face filling picks constituting cross ribs above said cords and spaced apart, back filling picks below the cords and arranged in groups between said ribs, and means to bind the aforesaid elements together including back warp threads lying below the back filling picks but held by the face picks above said cords at relatively long intervals and said back warp threads passing downwardly on each side of the face picks by which they are held to pass below adjacent back picks.

9. Elastic web, having a single layer of covered rubber warp cords, face filling picks constituting cross ribs above said cords and spaced apart, back filling picks below the cords and arranged in groups between said ribs, and means to bind the aforesaid elements together, including stuffing warp threads lying below a plurality of adjacent back picks but held by the face picks above said cords at relatively long intervals, said warps threads being staggered so that some are held by certain of the cross ribs and others by other of the cross ribs.

10. Elastic webbing, having a single layer of rubber cords, face filling picks above said cords constituting cross ribs, back filling picks below said cords, binder warp threads engaging certain of the back filling picks and all face cross ribs to perform a binding action, and back warp threads engaging certain back filling picks and alternate face ribs also to perform a binding action, and being exposed on the back of the web for the greater portion of their lengths.

11. Elastic webbing, having a single layer of rubber cords, face filling picks above said cords constituting face ribs, back filling picks arranged in groups below said cords, binder warp threads engaging the face ribs and back filling picks, and back warp threads passing alternately over and under the picks of one group and passing under all the picks of another group.

12. An elastic web, having a single layer of covered rubber cords crossed by face picks of filling constituting cross ribs, each containing one or more of said picks, said ribs cooperating with the cords and other elements of the web to form a reticulated face, back picks of filling more numerous than the face picks to serve in part to form part of a soft back for the web, binder warp threads engaging certain of the back picks and all the face picks to perform a binding action, and other warp threads more numerous than the binder threads and serving in part to bind the elements of the web together, said threads also being exposed on the back of the web for the greater part of their lengths to form with the back filling picks a soft back surface for the web.

13. Elastic webbing having a single layer of covered rubber warp cords, face picks of

filling above said cords constituting cross ribs spaced apart to form with the cords a reticulated face for the web, the number of reticules being substantially equal to the number of crossings of the rubber cords and face filling picks, picks of filling below said cords, and means to bind the aforesaid elements together including a number of warp threads engaging at intervals face picks of filling, and passing downwardly on each side thereof to pass below adjacent back picks and floated under a plurality of adjacent back filling picks to form a soft back surface for the web.

14. Elastic webbing having a single layer of covered rubber warp cords, face picks constituting cross ribs above said cords and spaced apart to form a reticulated face for the web, back picks of filling below said cords, binder warp threads engaging all of the face warps and face picks, and back warp picks held by certain of the face picks, and floated on the back of the web outside of a plurality of back filling picks to form a soft back surface for the web.

15. Elastic webbing having a single layer of rubber cords, face picks of filling above said cords constituting cross ribs, back filling picks below said cords, binder warp threads engaging certain of the back filling picks and all of the face cross ribs to perform a binding action, and back warp threads engaging certain back filling picks and face ribs also to perform a binding action and passing outside of a plurality of adjacent back picks to be exposed on the back of the web for the greater part of their lengths.

16. An elastic web having a single layer of covered rubber cords crossed by face picks of filling constituting cross ribs, each containing one or more of said picks, said ribs cooperating with the cords and other elements of the web to form a reticulated face, back picks of filling having a greater aggregate cross-section than the cross picks to serve in part to form a soft back surface for the web, binder warp threads engaging certain of the back picks and all the face picks to perform a binding action, and other warp threads more numerous than the binder threads and serving in part to bind the elements of the web together, said threads also passing outside of a plurality of adjacent back filling picks to form with the back filling picks a soft back surface for the web.

17. An elastic web, having a single layer of covered rubber cords crossed by face picks of filling constituting cross ribs, each containing one or more of said picks, said ribs cooperating with the cords and other elements of the web to form a reticulated face, back picks of filling more numerous than the face picks to serve in part to form part of a soft back for the web, binder warp threads engaging certain of the back picks and all the face picks to perform a binding action, and stuffing warp threads engaging fewer face picks than the binder warp threads and serving in part to bind the elements of the web together, said threads also being floated on the back of the web outside of a plurality of adjacent back filling picks to form with the back filling picks a soft back surface for the web.

In witness whereof, I have hereunto set my hand this 23rd day of April, 1926.

GEORGE E. CLAUSS.