

Oct. 11, 1927.

G. E. CLAUSS

1,644,667

ELASTIC WEBBING

Filed Dec. 31, 1926

2 Sheets-Sheet 1

Fig. 1.

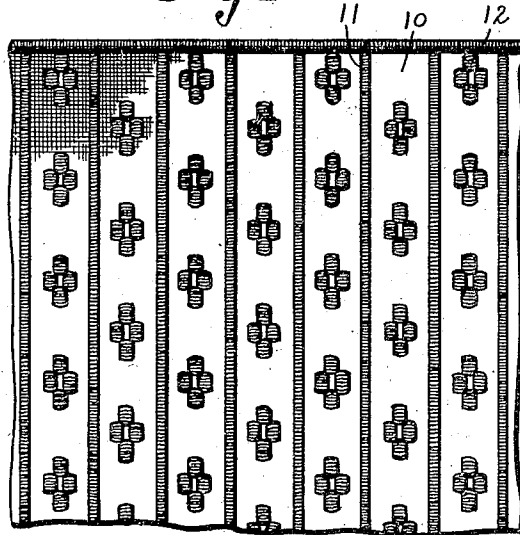


Fig. 3.

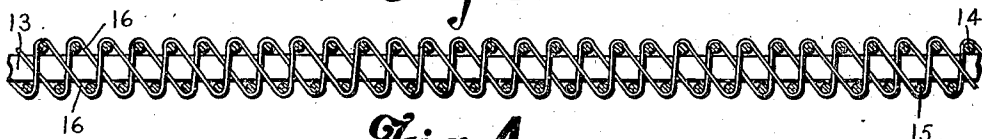


Fig. 4.

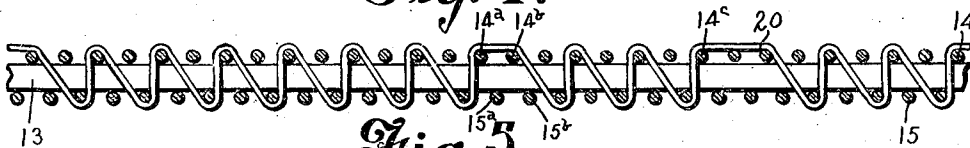


Fig. 5.

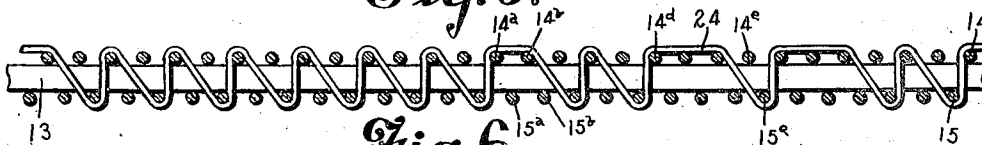


Fig. 6.

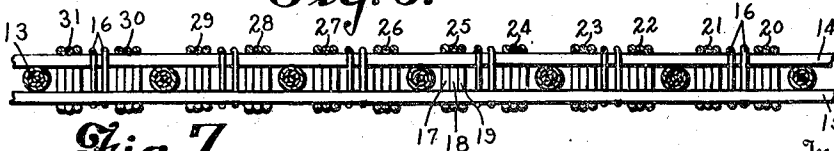
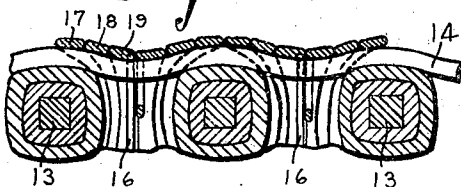


Fig. 7.



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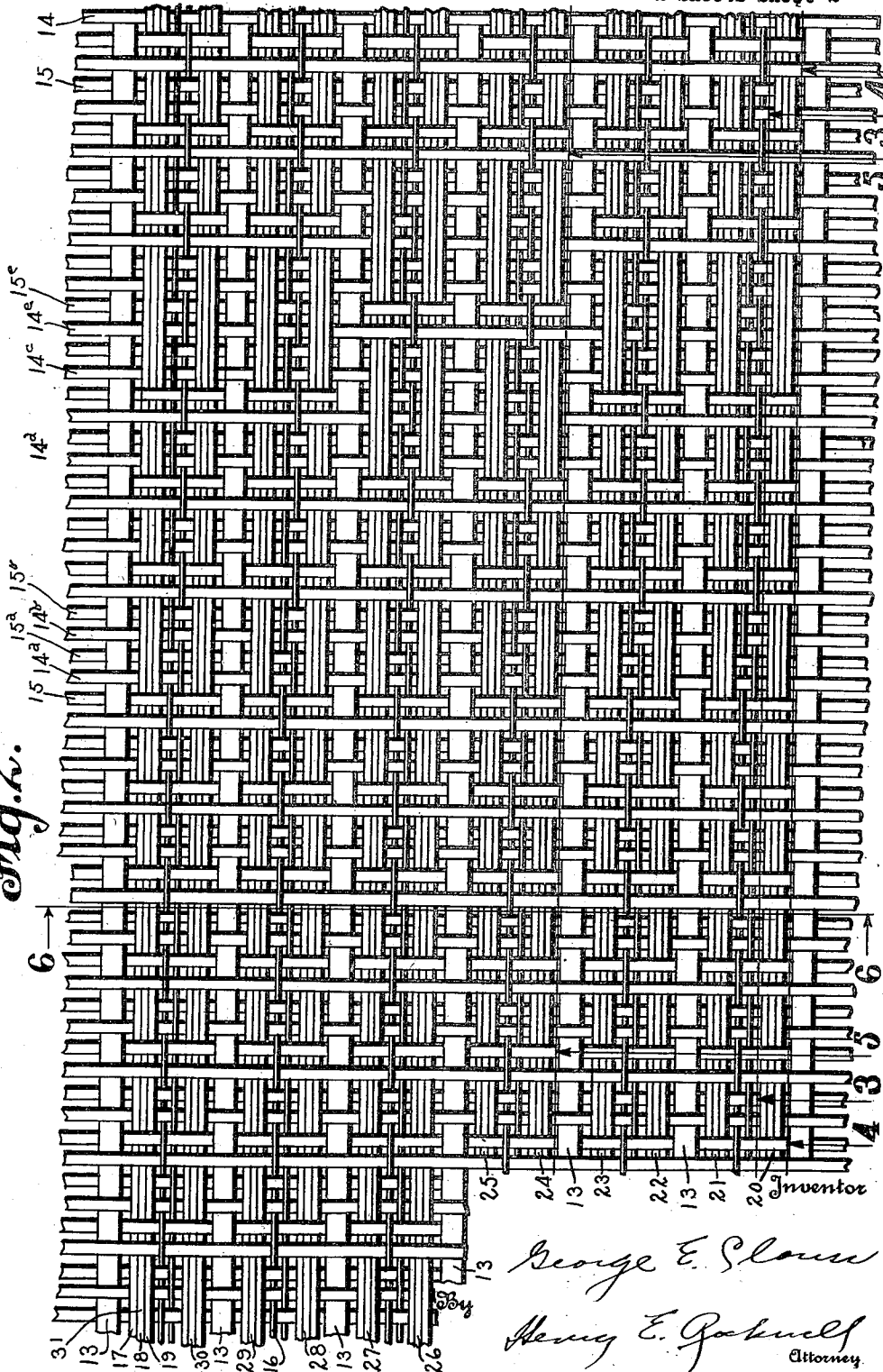
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2 Sheets-Sheet 2

Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE E. CLAUSS, OF ANSONIA, CONNECTICUT, ASSIGNOR TO THE ANSONIA O & C COMPANY, OF ANSONIA, CONNECTICUT.

ELASTIC WEBBING.

Application filed December 31, 1926. Serial No. 158,348.

This invention relates to elastic webbing, and more particularly to a webbing designed to be used in the manufacture of corsets, bandages and kindred articles where a strong fabric is desired. While the particular embodiment of my invention which I have illustrated and described is designed particularly for use in connection with the manufacture of corsets, it will be understood that the invention is not confined to such a web, and is equally applicable to short or long stretch webs, which latter have little initial tension.

In weaving an elastic web of this character, it is preferable to use covered rubber warp cords. These cords consist of a rubber strand covered with one or more layers of yarn. The rubber strand is usually covered under tension, the amount of this tension depending on the desired characteristics of the finished web. If, for instance, what is termed a long stretch web is to be made, the rubber will be covered in the cord under a relatively small amount of initial tension, but nevertheless will usually be stretched to some extent when the covering is applied. The strand will be held in this state of tension by the covering, so that if such cord is removed from the completed fabric, it will lie substantially flat and will be of the same length when removed from the fabric as when woven therein. It is different, however, if the rubber strand is removed from its covering, as in such case it will occupy only a fraction of the length of the covered cord.

If it is desired to make what is termed a short stretch web or a web which will require an application of considerable force to stretch it from its normal condition, the rubber strands will be placed under relatively great tension when covered, the amount of this tension, of course, depending upon the character of the finished web, that is, it will depend upon the amount of force it is desired that the web withstand before stretching. While in the case of the long stretch web the fabric will be relatively weak and will be stretched by a slight pull, a short stretch web will be relatively strong and will only yield elastically when a considerable force is applied. However, even

the cords used in a short stretch web may be so made that a very considerable amount of the tension of the rubber strand will be taken up or held by its covering so that the cord itself may not tend to shrink or curl up to an undesirable extent. There always, however, will be a greater tendency for such a cord to curl up when removed from the web than when the rubber strand is under less tension.

In the case of the completed web, and especially in connection with a short stretch web where the rubber is under considerable tension within the cord, the fabric always has a tendency not to lie flat but to curl up and wrinkle, and in order to make such webs lie flat, it is sometimes required that they be treated with an extensive amount of sizing or starching, and when so treated, they are ironed or finished in that condition. Such webs are very stiff and unyielding, and in some cases, may seem more like a piece of oil cloth than web, so stiffly are they starched. If not so treated, they are so uneven and crumpled that they present a poor appearance.

While a short stretch web resists an attempt to stretch it more strongly than the long stretch web, other things being equal, this condition may be varied to some extent by the quantity of rubber used. For instance, the rubber cords may be placed closely together in the long stretch web and thereby its resistance to stretching will be correspondingly increased.

Another desirable feature of a web of the character to which this invention relates is that it be extremely flexible and not easily creased. If, for instance, the rubber cords are held very tightly in the web in order to make them lie flat, and if the web contains a considerable amount of textile material for the same purpose, it is apt to destroy to a great extent the flexibility of the fabric, and thus make it less suitable for the use to which it is to be put.

It is contemplated by this invention to provide a web so woven that it will be strong and durable, the elements of which will be firmly bound together, and which at the same time will be flexible and require little or no starching or sizing to make it lie flat,

and at the same time to produce a weave by which either a short or long stretch web may be made.

Moreover, it is desirable in a web of this character to provide an ornamental surface, such that articles made therefrom will present a pleasing appearance, and this should be done without sacrificing the advantages heretofore mentioned. In the embodiment of my invention illustrated, this result is achieved by the use of figuring threads or elements woven as warps into the web and floated on the surface of the web to produce raised figures, such threads preferably being of some material having a bright luster, such as artificial silk.

One object of this invention, therefore, is to produce an elastic webbing which shall be strong and durable and which may be made either as a long stretch or a short stretch web.

Another object of this invention is to produce a web of this character which shall have an ornamental surface and which shall at the same time have its elements firmly bound together to produce a strong fabric.

A still further object of the invention is to produce a short or long stretch web suitable for use in the manufacture of corsets or kindred articles, which shall be strong and durable and which will require very little or no sizing or starching to make it lie flat, and which will at the same time be provided with an ornamental surface, so that it will meet with favor in the trade.

A still further object of the invention is the provision of a web of the character described which shall have an ornamental surface caused by the floating thereon of figuring warp threads having a bright luster, these threads serving as binder threads in another or plain part of the web to help bind the elements of the web firmly together to make a strong fabric.

A still further object of this invention is the provision of an elastic webbing having a figured or ornamental surface, the figures being formed by the same threads which in the plain portions of the web serve as binder threads to bind the elements of the web together.

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 a plan view of the face of the web;

Fig. 2 is a diagrammatic face plan view of the surface of the web, the threads being drawn apart or separated to show the manner of weaving;

Fig. 3 is a sectional view on line 3—3 of Fig. 2, showing the manner of weaving the binder warps;

Fig. 4 is a sectional view on line 4—4 of Fig. 2, showing the manner of weaving some of the figuring warps;

Fig. 5 is a sectional view on line 5—5 of Fig. 2, showing the manner of weaving others of the figuring warps;

Fig. 6 is a sectional view through the warp cords on line 6—6 of Fig. 2;

Fig. 7 is an enlarged fragmentary sectional view through the warp cords, showing as nearly as possible the actual state of the threads in the web.

As is usually the case, the webbing which I have selected to illustrate and describe, consists of a number of units repeated over and over again through the web, so that if one of such units is described with particularity the weaving of the entire web will be understood by those skilled in the art. In general, the face of the web as shown in Fig. 1, consists of a plain or unfigured portion or background 10, having stripes 11, running across the web in the direction of the weft threads, and between these stripes are figures 12, which are raised from the surface of the web and are formed of threads having a bright luster, so as to stand out in a striking manner. The stripes 11, will preferably be formed of the same or similar threads, so that they will also be clearly discernible and distinguished from the plain portions.

The unit to which I have referred, in this instance, will be equal in length to the distance between two of such stripes, that is, will comprise a figured and a plain portion of the web, and in width will be substantially equal to the length of one of the figures. This unit consists in width of six rubber warp cords and in length, of sixty filling picks, and one of such units is shown in Fig. 2.

The rubber warp cords are designated by the numeral 13, and while they would appear to be spaced to a considerable extent according to the diagrammatic view shown in Fig. 2, in reality these cords are spaced relatively closely together in the actual product. Each cord consists of a square rubber thread of No. 42 rubber covered first with a layer of yarn, on top of which is another winding of yarn wound as an open helix. The resulting cord has, in its soft, loose, natural state a diameter of about .05 of an inch, and the rubber itself will probably weigh one-sixth or less of the weight of a complete cord. In practice, the cords are spaced about .067 of an inch apart, although it will be understood that this may be varied according to the particular type of web desired.

A series of face filling picks, 14, lie above these cords, and between these face picks are back picks of filling, 15, lying below the cords, so that the filling material will consist of filling picks lying alternately above

and below the rubber cords. Each of such picks is preferably composed of two parallel threads of No. 26 two-ply cotton yarn, the parallel threads being delivered from the shuttle in the weaving operation as though they were one thread of double size. By using two such threads instead of one, additional flexibility is gained, and it also obviates the necessity of carrying in stock a larger number of different sizes of yarns. From the foregoing description it will be seen that the face filling picks 14 lie above all of the rubber cords, while the back picks in a similar manner lie below all of the rubber cords.

Between the rubber cords are disposed binder warp threads, 16, to bind the filling picks to the cords. In the embodiment illustrated, two of such binder warp threads are shown, these two threads lying adjacent each other and substantially midway between the cords. It will be understood, however, that the number and disposition of these threads may be varied to some extent without departing from the spirit of the invention. The threads of each of such binder warps pass over adjacent face and back filling picks, and then under the next face and back filling picks, so that each thread passes over two picks of filling and then under the next two. The threads of each pair are staggered, however, so that they cross each other and pass alternately to the face and back of the web in such a manner that each filling pick is engaged by one or the other of the threads to secure a firm binding action. That is, one of the threads will pass over alternate face filling picks and under alternate back filling picks, and the other thread will engage those filling picks not engaged by the first. This is clearly shown in Fig. 3 of the drawings. These binder warp threads may advantageously be No. 40 two-ply cotton yarn.

Between the binder warp threads and an adjacent rubber cord is placed a figuring warp element of artificial silk material. Each of these figuring warp elements is composed of a plurality of separate threads woven as a unit through the web, three of such threads, 17, 18 and 19, being shown in the drawing, although it will be understood that the number may be varied if desired. These threads are not woven alike through all parts of the web, but are woven in the plain or unfigured part to perform a binding action and thus assist the binder warp threads to secure the parts of the web firmly together, and are brought to the surface of the web to form the stripes 11 and the patterns or figures 12.

Beginning at the lower left hand corner of Fig. 2, it will be apparent that the figuring warp elements 20, 21, 22 and 23 are woven together through the web to pass under and over the same back and face picks of

filling, each of these elements passing under and over two picks of filling in a step until the face pick 14^a is reached. These elements all pass below the back pick 15 next adjacent the face pick 14^a and then together all rise to the surface to pass over the next four picks, consisting of the two face picks 14^a and 14^b and the two back picks 15^a and 15^b; continuing, these elements pass under and over two filling picks in a step as before until the face filling pick 14^c is reached, when they all rise to the surface to be floated over six picks of filling at a step to form the lower arm of the pattern or figure on the face of the web. After being floated over the six filling picks, three back and three face picks, they then pass under two picks and over two picks as before, to the end of the unit. At that part of the web where the figuring elements pass over four picks in a step, the stripe, 11, is formed.

The next four adjacent figuring warp elements, 24, 25, 26 and 27, are, beginning at the left hand end of Fig. 2 in the drawings, and, until they reach the filling pick 14^a, woven exactly as are the four figuring warps previously referred to. That is, these four figuring elements pass under and over the filling picks in steps of two such picks, and moreover, all pass under the same two and over the same two such picks and respectively under and over the same picks as the four figuring elements previously described. Likewise, when they reach the face pick 14^a they all rise to the top of the web to be floated over the next four filling picks, just as the figuring elements 20 to 23 inclusive, in order to form the continuous stripe. Continuing, they then pass under two and over two filling picks until the pick 14^d is reached, when they are brought to the surface of the web to be floated over the next six filling picks to form the left hand arm of the figure. They then pass under the filling picks 14^e and 15^e and again rise to the surface to be floated over the next six adjacent filling picks to form the right hand arm of the figure. They then pass under the next two picks, over the next two, and so on to the end of the unit. The next four figuring warps, 28, 29, 30 and 31 are all woven together through the web, passing under and over the same upper and lower filling picks exactly as do the figuring elements 20 to 23, so it will be unnecessary to trace the course of these elements through the web. They rise together at the face filling pick 14^e to pass over the next six picks of filling to form the upper arm of the figure, and likewise pass over the four picks of filling, 14^a, 15^a, 14^b and 15^b, to form the continuous stripe.

It will be apparent that in the plain portions of the web the figuring warp elements are woven in the same manner and are not staggered but are woven in parallel relation

so that all pass over and under the same picks of filling, and moreover, they all rise together to pass over four adjacent picks of filling to form the continuous stripe. Only
 5 in the region of figures does the manner of weaving differ, and then it differs only in order that the four intermediate figuring elements, 24 to 27 inclusive, may be twice
 10 floated over a number of adjacent filling picks within the unit so as to form two arms of the unit. It will be noted, however, that each group of four figuring elements, or, in
 15 other words, each group which forms an arm of the pattern, are woven through the web together in unison, and all pass under the same back pick of filling before rising to the surface to form the stripe or pattern.

In the case of the stripe, all pass under the same back filling pick before rising to
 20 the surface.

As has been stated, each figuring warp element consists as shown in the drawings of three separate threads. These threads are preferably No. 300 denier artificial silk and
 25 are delivered to the loom in parallel and woven into the web as though they were one thread instead of three. In other words, they are bunched together in parallel fashion, and preferably in loose untwisted condition, the multiple threads so used having
 30 a very distinct and great advantage. When they come to the surface of the web and float over a plurality of adjacent picks, they spread out laterally separate from each other
 35 to produce a broad, glossy effect. They not only expand laterally, but to some extent upwardly, and do this more and more as the picks which they cross are increased in number. In other words, when a considerable
 40 number of surface picks are crossed over by these silk threads, they spread out to substantially cover the face of the web at that point to produce a marked glossy effect of a well known pattern of embroidery. In the
 45 plain portion of the web, however, the three threads will be tightly and closely grouped together, and as each is of substantially the same size as one of the binder threads, each element composed of the three threads will
 50 be large and strong, and as in this part of the web they are woven in much the same manner as the binder threads and woven tightly, a very powerful binding effect will be produced. The result is that these artificial
 55 silk warps not only bind the web in a powerful fashion in the plain portions thereof, but also, where desired, rise to the surface to produce stripes and ornamental figures resembling embroidery.

It will be obvious that between each pair
 60 of covered rubber warp cords are eight distinct threads of yarn. The adjacent rubber cords may, however, be set relatively closely together partly because the threads are compressed to some extent and partly because

they embed themselves into the covering of the rubber cords. The individual threads of each figuring warp element, being in loose
 70 untwisted condition, are free and well able to adapt themselves to the available space between the rubber cords. At the same time, they spread out upon the surface of the web so that the threads of adjacent elements are substantially in contact and substantially
 75 cover the rubber cords and the binder warps. By having a very large number of warp cords in a unit of width, that is, having the warp cords closely spaced, the web may be very strong and elastic in spite of the
 80 fact that the rubber inside of each cord is quite small. Furthermore, as the rubber is small and has a relatively large amount of cotton covering on its surface, it may be comparatively short with respect to the length
 85 of the assembled cord.

In Figure 7 of the drawings, the web is shown in cross section and the threads are placed as nearly as possible in the condition
 90 in which they actually exist in the completed web. It will be seen that the threads of the figuring warp elements spread out laterally to substantially cover the surface of the web and that a group of such adjacent elements
 95 rise to the surface together to float over the face picks. It has been explained that these warp elements float over a plurality of adjacent face picks to form the figures. As shown in Figure 7, the threads of these elements may lie fairly closely against the surface
 100 of the first of these picks, but they probably do not lie so closely against the next adjacent pick, but to some extent expand upwardly so that the figure formed by them is somewhat raised from the surface of the plain portions of the web.
 105

The various elements of the web are said to be woven in unison or parallel when these elements pass over or engage in the same way the same face picks and pass under or
 110 engage in the same way the same back picks. The elements are said to be staggered, when although they may be woven in the same way through the web, they do not engage the same picks in the same way. In the
 115 embodiment of my invention illustrated in the drawings, the binder warp threads are woven in the same way through the web, but are in staggered relation. The figuring warps, however, in the plain portions of the web, are woven in unison or parallel, that is,
 120 they all engage the same face picks in the same way and the same back picks in the same way, and as shown, they all engage alternate face picks and alternate back picks. While such arrangement produces a very
 125 desirable web, the particular weave described may be varied to some extent without departing from the spirit of the invention.

A piece of web made according to the foregoing description requires little or no
 130

starching or finishing to make it lie flat and smooth. It will, moreover, be very firm and strong, as the elements are securely bound together, and will possess a distinctly ornamental and pleasing appearance, all of which features are especially desirable for a web of this character.

While I have shown and described a preferred embodiment of my invention, it is to 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 within the scope of the appended claims.

What I claim is:

1. Elastic webbing comprising covered rubber warp cords and filling picks above and below said cords and figuring warp elements engaging the upper and lower filling picks to serve as binder elements in the plain unfigured portions of the web and floated over a number of adjacent face filling picks to form a raised figure on the face of the web, each of said figuring warp elements comprising a number of threads held closely together in the plain portions of the web and spreading out on the surface at the figured portion thereof to substantially cover the web surface where a figure is formed.

2. Elastic webbing comprising covered rubber warp cords, picks of filling above and below said cords, binder warp threads to bind the upper and lower filling picks to the cords, and a plurality of figuring warp elements engaging the upper and lower filling picks to also serve as binder elements in the plain unfigured portions of the web and floated over a number of adjacent face filling picks to form a raised figure on the face of the web, each of said figuring warp elements comprising a number of threads held closely together when passing downwardly between the rubber cords and spreading out

on the surface at the figured portions thereof to substantially cover the web surface where a figure is formed.

3. An elastic webbing comprising covered rubber warp cords, face and back filling picks above and below said cords, binder warp threads to bind the filling picks to the cords and figuring warp elements also serving as binder warps in certain portions of the web and floating over a plurality of adjacent face picks to form an ornamental figure on the surface of the web, each of said figuring warp elements comprising a relatively large and free group of threads adapted to be tightly woven between the rubber warps in the plain part of the web, and adapted to spread out laterally over the surface of the web at the figured portions thereof.

4. An elastic webbing comprising covered rubber warp cords, face and back filling picks above and below said cords, binder warp threads to bind the filling picks to the cords and figuring warp elements also serving as binder warps in certain portions of the web and floating over a plurality of adjacent face picks to form an ornamental figure on the surface of the web, each of said figuring warp elements comprising a relatively large and free group of threads adapted to be tightly woven between the rubber warps in the plain part of the web, and adapted to spread out laterally over the surface of the web at the figured portions thereof, and a group of adjacent ones of said figuring warp elements, being woven in unison through the web where a binding action is produced to engage the same face and back picks in the same way.

In witness whereof, I have hereunto set my hand this 30th day of December, 1926.

GEORGE E. CLAUSS.