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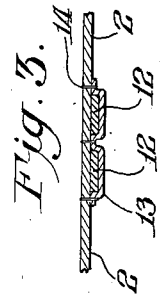
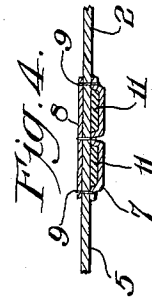
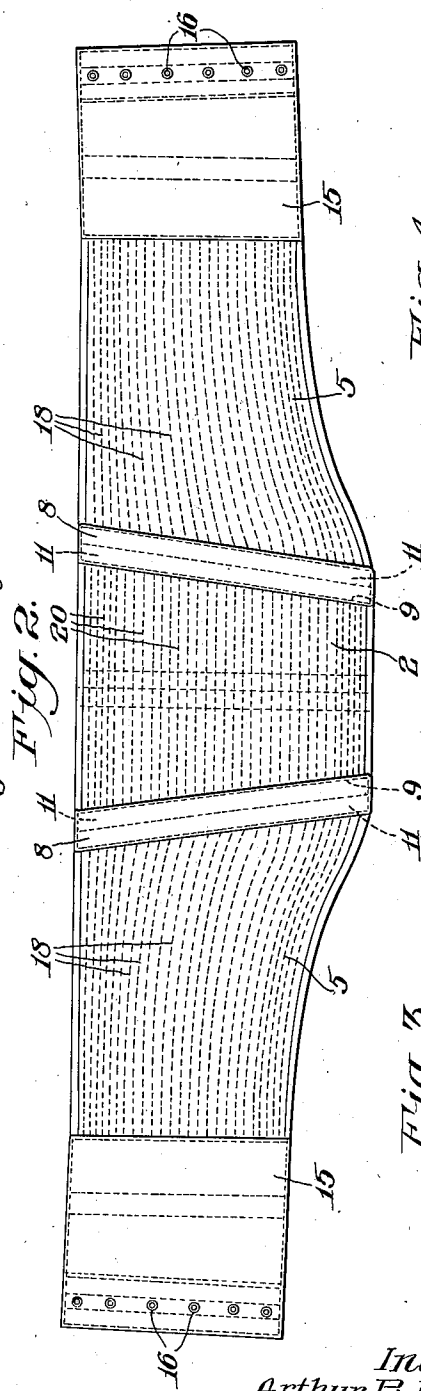
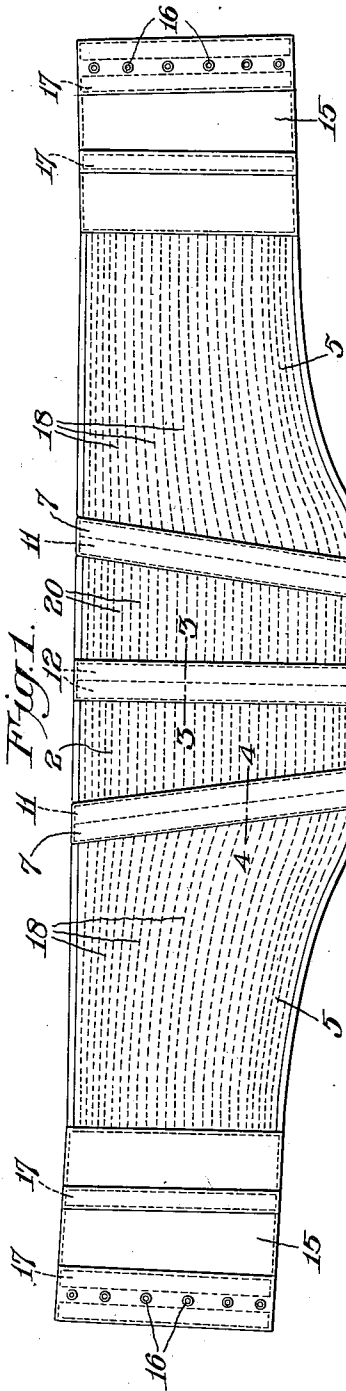
A. B. KENDRICK

2,097,159

SURGICAL APPLIANCE AND METHOD OF PRODUCING SAME

Filed Oct. 30, 1936

2 Sheets-Sheet 1



Inventor
Arthur B. Kendrick
by *A. V. Grouse*
Attorney.

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A. B. KENDRICK

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Fig. 5.

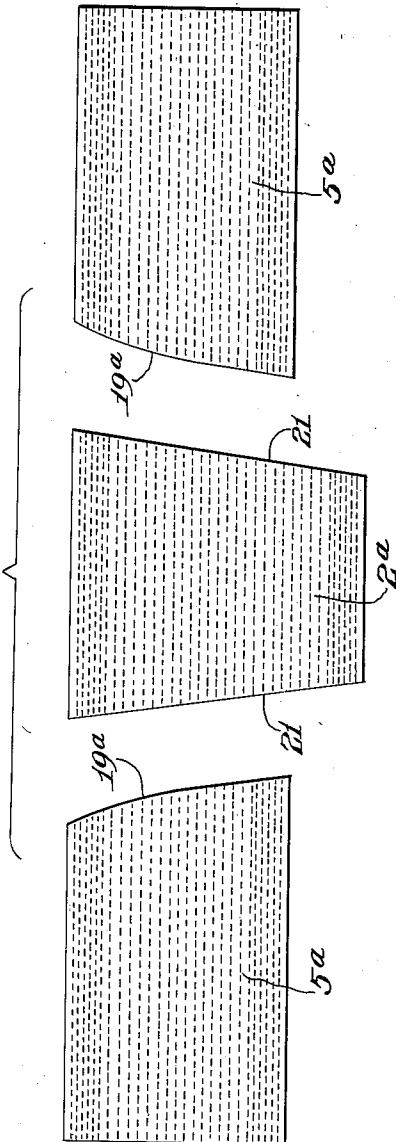
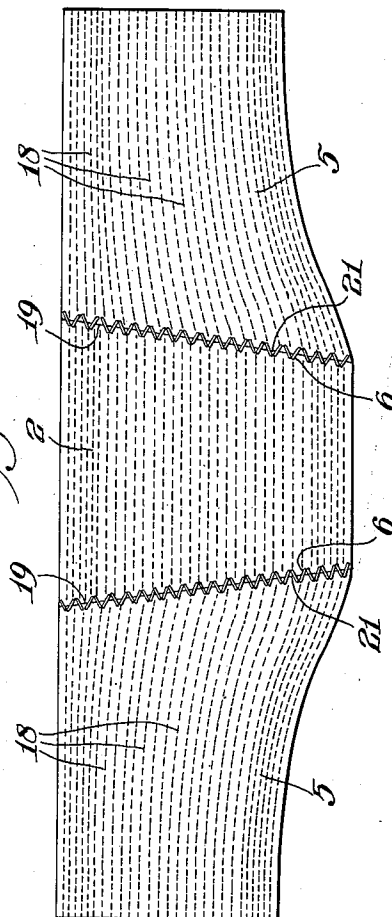


Fig. 6.



Inventor
Arthur B. Kendrick
by *A. V. Grouse*
Attorney.

UNITED STATES PATENT OFFICE

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SURGICAL APPLIANCE AND METHOD OF
PRODUCING SAME

Arthur B. Kendrick, East Orange, N. J., assignor
to James R. Kendrick Co., Inc., Philadelphia,
Pa., a corporation of Pennsylvania

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7 Claims. (Cl. 2—41)

This invention relates to improvements in surgical appliances and particularly to surgical belts or bandages, employing in the construction thereof sections of elastic fabric comprising body forming threads and stretchable elastic strands inlaid in the body of the fabric in side-by-side relationship. In many such appliances, it is desirable that a fashioning section of the elastic fabric shall be of gradually widening construction and merge into and be a continuation of an adjacent fabric section of the appliance.

In the gradually widening part of the fashioning section it is necessary for the inlaid elastic strands to diverge and follow the gradually widening lines of the section, and, heretofore the gradually widening fashioning section and the section which formed a continuation of the widened end portion thereof have been formed of a single piece of elastic fabric within which the elastic strands extended uninterruptedly through the fashioning section and the adjacent section which constituted a continuation thereof.

The production of the two fabric sections referred to in a single piece has had the objections of being expensive and of requiring irregular operations in the manufacture thereof.

The object of the present invention is to remove the objections referred to, and to provide a novel and advantageous appliance in which the gradually widening fashioning section shall be formed of one piece of elastic fabric and the adjacent fabric section which constitutes a continuation thereof shall be separately formed of another piece of fabric, and in which means is provided for uniting the contiguous edges of the two sections, thereby reducing the manufacturing costs of the appliance of which the two sections form a part.

With the foregoing and related objects in view, the invention resides in the novel construction and relation of the parts or sections of the appliance and in the art or method of producing the same, as will be hereinafter described and claimed.

In the accompanying drawings, illustrating the invention,

Figure 1 is a front view of an appliance in the form of a belt or bandage, illustrating one form of embodiment of the invention.

Figure 2 is a back view of the appliance.

Figures 3 and 4 are enlarged sections through parts of the appliance, on lines 3—3 and 4—4, respectively, of Fig. 1.

Figure 5 is a view of three fabric sections of the appliance, showing the condition thereof be-

fore two of the sections have been fashioned in accordance with my invention.

Figure 6 is a view showing the three fabric sections illustrated in Fig. 4, after the two side sections have been fashioned and united with the central section.

Referring to the drawings, the belt or appliance shown in Figs. 1, 2, 3, 4 and 6 includes in its construction three separately formed elastic fabric sections, the same being a wide central section 2 and side sections 5, 5 narrower than the central section and extending from opposite sides thereof.

The contiguous edges of the adjacent or meeting portions of the fabric sections 2, and 5, 5 are sewed together or united by sewing stitches 6, as shown in Fig. 6. The fabric sections are connected further, for strength and durability, by outer and inner tapes 7 and 8 which extend longitudinally of the meeting edges of the sections 2 and cross the same on the outer and inner surfaces of the appliance and are sewed to the sections by lines of stitches 9 and 10 respectively.

Resilient stiffening stays 11, 11 of metal or other suitable material are enclosed in pockets formed between each tape 7 and the forward surface of the fabric sections and between parallel lines of the stitches 9; and the central portion of the central fabric section 2 is provided with similar resilient stiffening stays 12, 12 enclosed in pockets formed between the forward surface of the section 2 and a tape 13, and between parallel lines of stitches 14 which secure the tape 13 to the section 2.

The ends of the side sections 5, 5 remote from the central section 2 have attached thereto extension members 15, 15 formed of flexible, non-elastic fabric and having eye-lets 16 in the free end portions thereof for the reception of a lacing or lacings as a means for drawing the free ends of the appliance toward each other and holding the belt or appliance in place when it is applied to the body of the wearer.

The extension members 15 are provided with resilient stiffening stays 17 which are enclosed in pockets formed by parts of the members.

The side sections 5, 5 are formed of elastic fabric and they are each fashioned to provide a widening end portion which terminates at the central section 2 and the essence of my invention is in the construction of the fabric of these side sections 5, 5 and the relation of the parts or elements thereof to each other and to the central fabric section 2 to which the wide ends of the side sections are attached, and also in the method

or art of fashioning or forming each of the side sections and combining it with the central section.

Each side section 5 is formed of elastic fabric comprising suitably related knitted, woven or braided threads forming the body of the fabric, and stretchable elastic strands inlaid in the body of the fabric and extending longitudinally thereof in side-by-side relationship, the elastic strands being indicated by the dotted lines 18. These elastic strands 18 extend from end to end of each fabric section 5 and they diverge in the widening end portion thereof to and terminate at a raw edge 19 at the wide end of the section.

The wide central section 2 is formed of similar elastic fabric having stretchable elastic strands 20 inlaid in the body thereof in side-by-side relationship. The elastic strands 20 of the central section are more numerous than those of each side section 5, 5 to compensate for the greater width of the central section and to preserve, to a large extent, the same general appearance of the elastic fabric throughout the area of the three sections 2 and 5, 5 thereof which form the main body of the appliance.

Any suitable well known elastic fabric having longitudinally extending, stretchable elastic strands inlaid in the body thereof may be employed in my invention. An example of such fabric is shown and described in Patent No. 1,533,544, dated April 14, 1925. The fabrics forming the sections 2, and 5, 5 may be like the fabric having the stretchable elastic strands inlaid in the body thereof, as illustrated and described in said patent or they may be like any of the well known warp knit fabrics, or like the double ribbed or "Raschel" fabrics well known in this art, having stretchable elastic strands inlaid in the bodies thereof, or they may be like any of the well known woven or braided fabrics having stretchable elastic strands inlaid therein.

In making my improved appliance, as illustrated herein, I provide three separate pieces of elastic fabric 2^a and 5^a, 5^a, as shown in Fig. 4. These pieces of fabric are used to make the three sections 2 and 5, 5, respectively, of the appliance shown in Figs. 1 and 2, and the stretchable elastic strands thereof are indicated by the dotted lines thereon. The pieces 5^a, 5^a are of uniform width throughout the length thereof, and their elastic strands are inlaid therein in parallel, side-by-side relationship and they may be advantageously cut from a continuous strip of fabric for economy of manufacture. Likewise, the piece 2^a is of uniform dimensions between the top and bottom thereof and a number of like pieces may be cut from a continuous strip of fabric for economy, or the piece may be formed with selvage side edges. The piece 2^a is shaped as shown in Fig. 5, the side edges 21, 21 being of bias formation as illustrated.

In cutting the strips of fabric to produce the two side pieces 2^a, 2^a, such strips are cut slantingly on curved or partially curved lines to produce the inner raw edges 19^a, 19^a of outwardly curved bias formation.

The raw edges 19^a, 19^a of the side pieces 5^a, 5^a are shorter than the side edges 21, 21 of the piece 2 with which they are to be united.

After the side pieces 5^a, 5^a have been provided, as shown in Fig. 5, the end portion of the body of each piece 5^a adjacent to its raw edge 19^a is fashioned by stretching it transversely by hand and/or suitable mechanical means until its raw edge has been straightened and elongated to the length of the adjacent edge 21 of the piece 2, or

substantially so, and until the adjacent portion of the piece 5^a is gradually widened toward its raw edge 19^a, as shown in Fig. 5. When each piece 5^a, 5^a is thus fashioned, its inlaid elastic strands are gradually separated in the gradually widening portion thereof until they diverge toward the raw edge 19 and follow the gradually widening lines of the piece of fabric, as indicated by the dotted lines 18 in Fig. 6.

I have found it advantageous to moisten or wet each fabric piece 5^a, 5^a by the application of water thereto before stretching the same in the fashioning operation; and, further, I have found it advantageous to press the stretched portion by applying a heated iron thereto as in the ordinary fabric or cloth ironing or pressing operation. The ironing operation facilitates the drying of the wet or moistened fabric and assists in setting it in its stretched condition.

After the side pieces 5^a, 5^a have been fashioned, as shown in Fig. 6, their raw edges 19, 19 are placed in close proximity to or in contact with the side edges 21, 21 of the piece 2, and the three pieces are sewed together by the lines of thread stitches 6 which cross the contiguous edges of the fabric pieces and unite them to form the fabric sections 2 and 5, 5 of the appliance, as shown in Fig. 7.

After the sections have been thus united, the tapes 8, 8 are sewed to the rearward surface thereof and the tapes 7, 7 and 13 sewed to the forward surface thereof with the stiffening stays 11, 11 and 12, 12 enclosed between the fabric sections and the tapes 7, 7 and 13, respectively. The extension members 15, 15 may be attached to the outer ends of the side sections 5, 5 either before or after the sections have been united as described.

The stiffening stays 11, 11 in the regions of the united contiguous edges of the sections 2 and 5, 5 not only give stability to the appliance as a whole, but they serve to hold or maintain the widened end portions of the side sections in the stretched condition thereof.

In the broad aspect of my invention, the fabric section to which the widened end of either fashioned section 5 is united may be of any desired character, in accordance with the form and character of the appliance in which the invention is used. When, however, the invention is used in a belt or bandage of the character herein illustrated, it is usually desirable that the central section be formed of elastic material whose elements are related to the elements of the fashioned fabric sections, as herein shown and described.

I claim:

1. In a surgical appliance, two separately formed fabric sections having contiguous edges, one section having stretchable elastic strands inlaid in the body thereof in side-by-side relationship, and having a portion thereof widening toward its said contiguous edge, and having its elastic strands diverging in its widening portion toward said edge, and means uniting said edges, the fabric section containing said strands being elastic longitudinally of the strands and substantially inelastic transversely of the strands.

2. In a surgical appliance, two separately formed fabric sections having contiguous edges, one section having stretchable elastic strands inlaid in the body thereof in side-by-side relationship, and having a portion thereof widening toward its said contiguous edge, and having its elastic strands diverging in its widening portion toward said edge, means uniting said edges, the fabric section containing said edges, the fabric section containing said strands being elastic lon-

gitudinally of the strands and substantially inelastic transversely of the strands, and stiffening means preventing the united edges of said sections from buckling transversely of said strands.

5 3. A belt comprising a wide central fabric section having side edges, and two side fabric sections having portions narrower than the central section and having raw edges contiguous to the side edges of the central section, each section having stretchable horizontally-extending elastic strands inlaid in the body thereof in side-by-side relationship, and each side section having a portion thereof widening toward said central section and having its elastic strands diverging in its
10 widening portion toward said central section, and means uniting each side edge of the central section and the contiguous raw edge of its adjacent side section, the fabric of each section being elastic horizontally and substantially inelastic vertically.
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4. A belt comprising a wide central fabric section having side edges, and two side fabric sections having portions narrower than the central section and having raw edges contiguous to the side edges of the central section, each section having stretchable horizontally-extending elastic strands inlaid in the body thereof in side-by-side relationship, and each side section having a portion thereof widening toward said central section and having
25 its elastic strands diverging in its widening portion toward said central section, means uniting each side edge of the central section and the contiguous raw edge of its adjacent side section, the fabric of each section being elastic horizontally and substantially inelastic vertically, and stiffening means preventing the united edges of said sections from buckling vertically.
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5. The art of manufacturing a belt or the like which consists in providing two side fabric sections and a wider central fabric section having side edges longer than the width of the side sections, each side section comprising threads forming a body and longitudinally extending elastic strands inlaid therein in side-by-side relationship, the body of each side section being elastic longitudinally of its strands and substantially inelastic transversely thereof, cutting the fabric of the side sections transversely of the strands thereof and thereby providing each side
40 section with a raw edge, lengthening the raw edges of said side sections to correspond with the length of the side edges of said central section by stretching the body of the fabric of each
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side section in the region of its raw edge and thereby permanently increasing the spaces between the elastic strands in said region, and securing the lengthened raw edges of the side sections to the corresponding side edges of the central section.
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6. The art of manufacturing a belt or the like which consists in providing two side fabric sections and a wider central fabric section having side edges longer than the width of the side sections, each side section comprising threads forming a body and longitudinally extending elastic strands inlaid therein in side-by-side relationship, the body of each side section being elastic longitudinally of its strands and substantially inelastic transversely thereof, cutting the fabric of the side sections biasly and transversely of the strands thereof and thereby providing each side section with a raw edge of bias formation, lengthening the raw edges of said side sections to correspond with the length of the side edges of said central section by stretching the body of the fabric of each side section in the region of its raw edge and thereby permanently increasing the spaces between the elastic strands in said region, and securing the lengthened raw edges of the side sections to the corresponding side edges of the central section.
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7. The art of manufacturing a belt or the like which consists in providing two side fabric sections and a wider central fabric section having substantially straight side edges longer than the width of the side sections, each side section comprising threads forming a body and longitudinally extending elastic strands inlaid therein in side-by-side relationship, the body of each side section being elastic longitudinally of its strands and substantially inelastic transversely thereof, cutting the fabric of each side section on a curved line transversely of the strands thereof and thereby providing each side section with an outwardly curved raw edge, straightening and lengthening the raw edges of said side sections to correspond with the length of the side edges of said central section by stretching the body of the fabric of each side section in the region of its raw edge and thereby permanently increasing the spaces between the elastic strands in said region, and securing the lengthened raw edges of the side sections to the corresponding side edges of the central section.
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ARTHUR B. KENDRICK.