Dec. 14, 1943. W. D. YOUNG 2,337,011

BANDAGE AND METHOD OF MAKING SAME

Filed Sept. 30, 1942 3 Sheets-Sheet 1

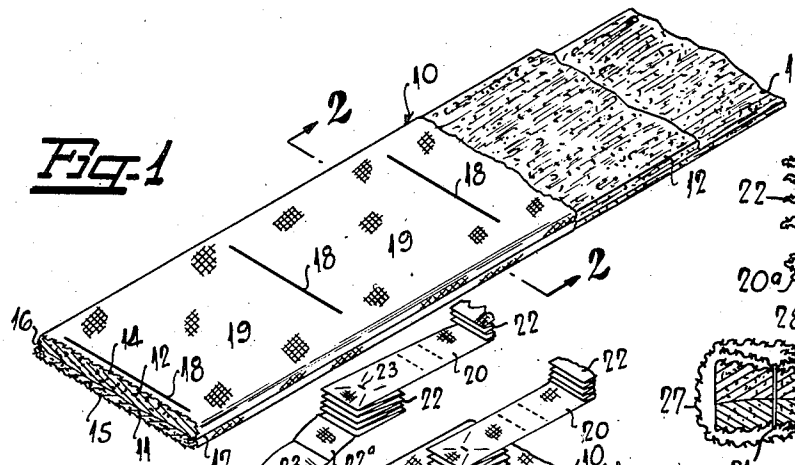


Fig. 1

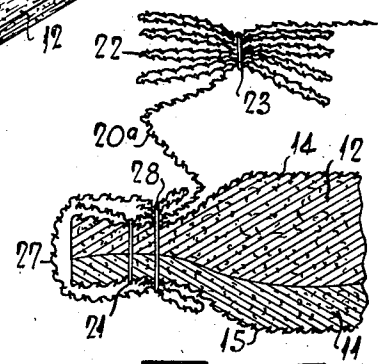


Fig. 5

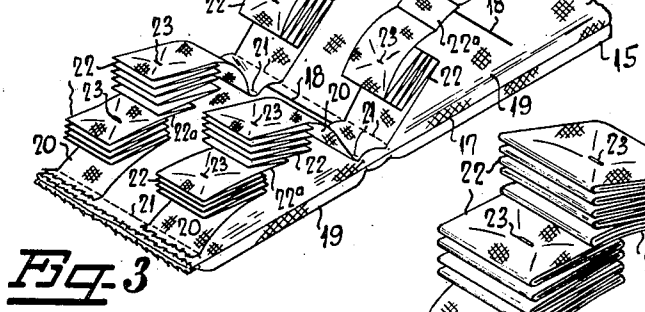


Fig. 3

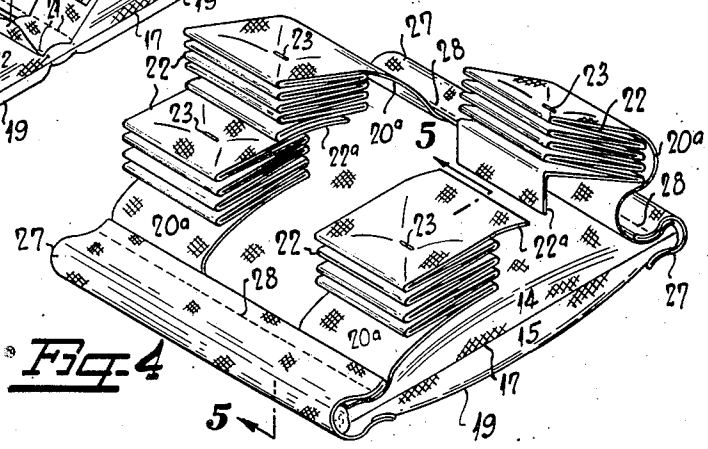


Fig. 4

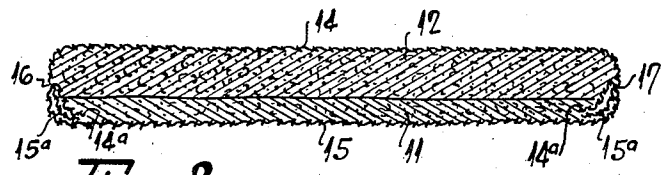


Fig. 2

Inventor:
WILLIAM D. YOUNG

By

Eaton & Brown
Attorneys

Dec. 14, 1943. W. D. YOUNG 2,337,011

BANDAGE AND METHOD OF MAKING SAME

Filed Sept. 30, 1942 3 Sheets-Sheet 2

Fig. 8

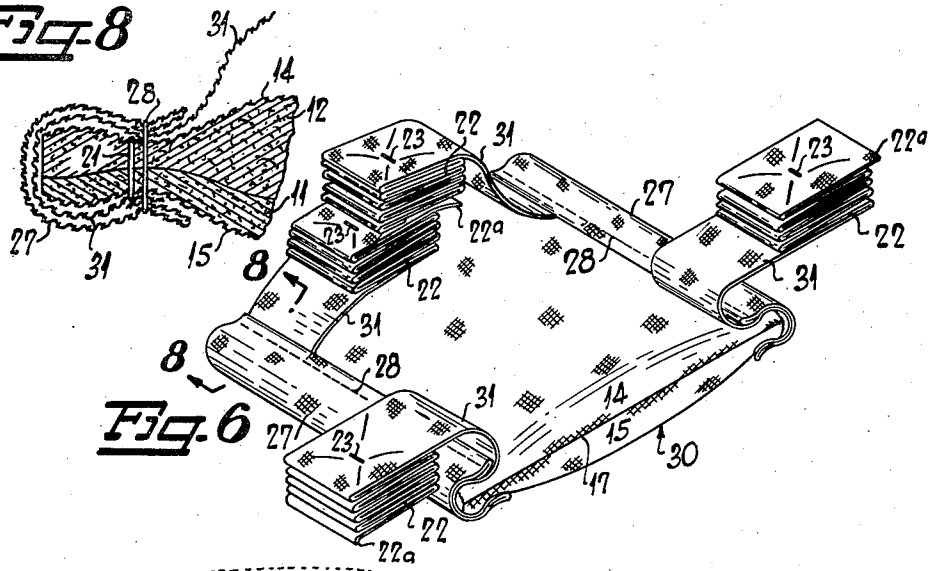


Fig. 6

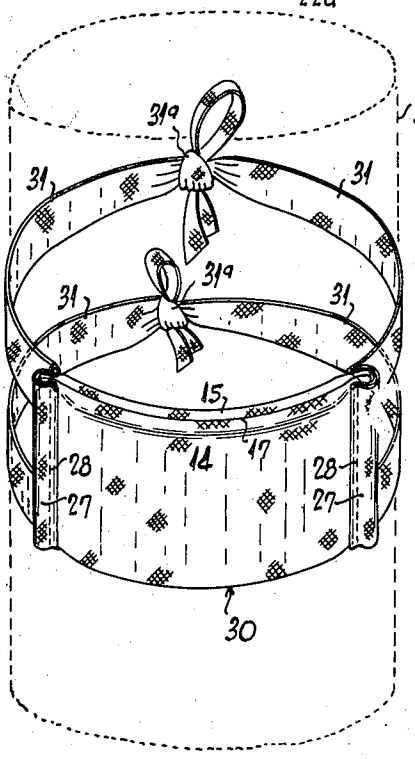


Fig. 9

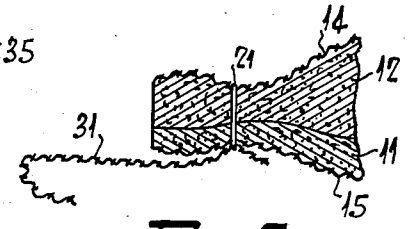


Fig. 7

Inventor:
WILLIAM D. YOUNG

By

Eaton & Brown
Attorneys

Dec. 14, 1943. W. D. YOUNG 2,337,011

BANDAGE AND METHOD OF MAKING SAME

Filed Sept. 30, 1942 3 Sheets-Sheet 3

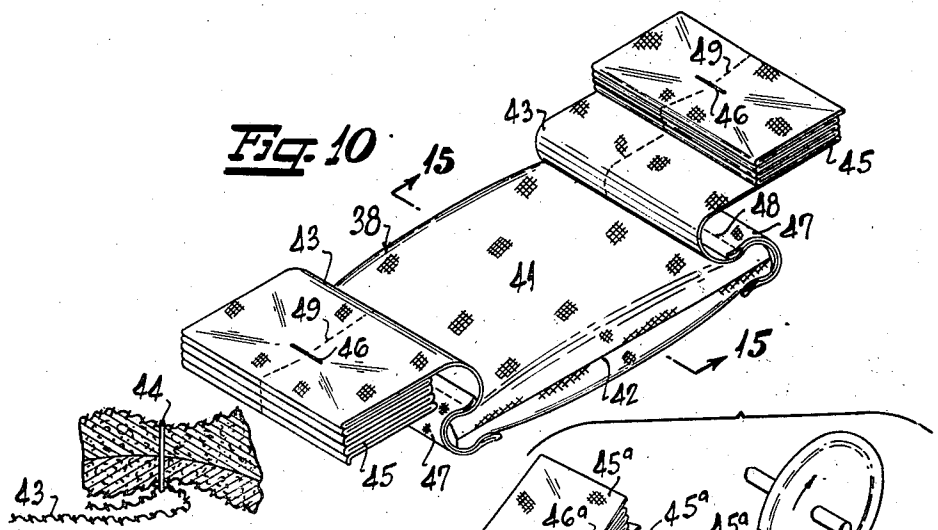


Fig. 10

Fig. 13

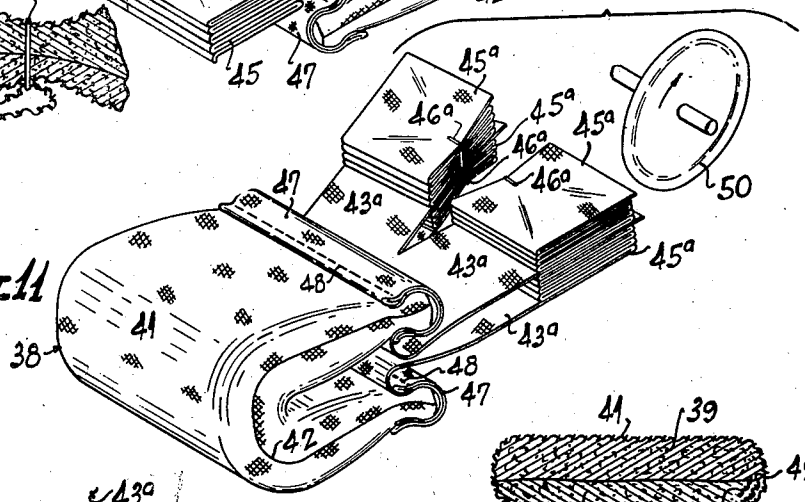


Fig. 11

Fig. 15

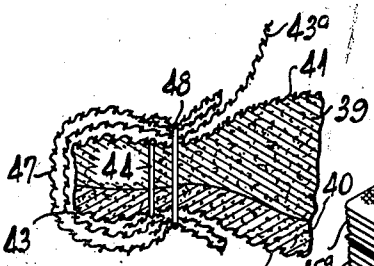


Fig. 14

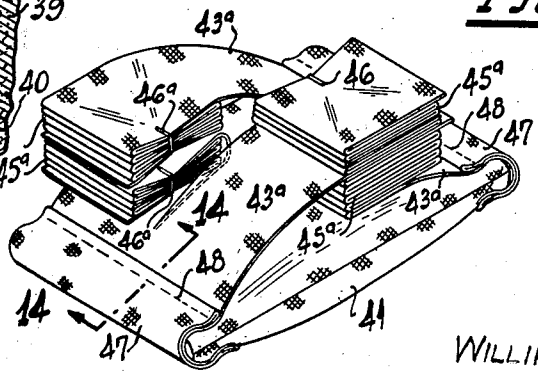


Fig. 12

Inventor:
WILLIAM D. YOUNG

By

Eaton & Brown
Attorneys

Patented Dec. 14, 1943

2,337,011

UNITED STATES PATENT OFFICE

2,337,011

BANDAGE AND METHOD OF MAKING SAME

William D. Young, Greenville, S. C.

Application September 30, 1942, Serial No. 460,252

10 Claims. (Cl. 128—155)

This invention relates to an improved surgical bandage and method of making the same, and more especially to an article of this class designed to fit upon an injury or wound with the minimum amount of discomfort to the patient.

It is conventional practice to apply a bandage to an injury and then secure it in position by adhesive tape, tie strings, or the like. When using these securing means, the intermediate portion of the tape or string is usually positioned on the outside surface of the bandage and the ends of the tape or string are attached to the adjacent uninjured portions of the patient's body. Since the bandage is usually of considerable thickness there is a tendency for the tape or tie strings to exert a much greater pressure near the edge of the bandage than at the central portion. This increased pressure is partially due to the abrupt change in the direction of pull upon the securing tape as the same leaves the bandage to be attached to the body. In other words, the tape passes over an inward step equal to the thickness of the bandage, and consequently, the tensioned tape will press the bandage edge against the patient's body with a greater force at this step than at other points to cause further injury or discomfort. After the wound is dressed, swelling or traumatism begins in an hour or two making the adjacent tissues to the wound as sensitive as the wound itself; consequently, the above-named steps in the bandage will irritate surfaces of the body that otherwise would not be affected thereby.

It is an object of this invention to provide an improved bandage having tie tapes or other securing means extending from the inside contact face of the bandage. With such a construction, the tension exerted upon the securing means will produce uniform inward pressure upon all of the contact surfaces of the bandage.

It is another object of this invention to provide a bandage in which the tie tapes or other securing means are connected thereto in a novel manner so that the connection will more effectively withstand the tensile stresses ordinarily present in the tapes when the bandage is applied.

It is another object of this invention to provide a bandage of the class described having tie tapes extending therefrom, each of said tie tapes being folded back and forth upon itself to form a condensed batch, thereby occupying less space, and adding utility to the bandage. If desired, the adjacent layers of each batch may be releasably secured together so that the tape will not readily distend when handling the bandage.

It is still another object of this invention to provide a bandage which readily lends itself to streamlined continuous flow of production without sacrificing any of the high standards required of products of this nature.

Some of the objects of the invention having been stated, the other objects will appear as the description proceeds when taken in connection with the accompanying drawings in which:

Figure 1 is an isometric view of the body portion for my improved surgical bandages, the length of said portion shown being sufficient to form a plurality of bandages therefrom;

Figure 2 is a transverse sectional view taken along the line 2—2 in Figure 1;

Figure 3 is an isometric view similar to Figure 1, but showing tie tapes being applied to the body portion;

Figure 4 is an isometric view of a bandage after the tie tapes have been attached and after the ends of the bandage have been bound;

Figure 5 is an enlarged sectional view taken along the line 5—5 in Figure 4 illustrating a binding and tie tape construction;

Figure 6 is an isometric view showing a slightly modified form of bandage;

Figure 7 is an enlarged sectional view taken the first step in forming the bandage illustrated in Figure 6;

Figure 8 is an enlarged sectional view taken along the line 8—8 in Figure 6 showing the binding and tie tape construction of the completed bandage;

Figure 9 is an isometric view showing the bandage applied to a limb of a patient's body;

Figure 10 is an isometric view of another slightly modified form of bandage, said bandage being partially completed;

Figure 11 is an isometric view showing the next step in the construction of the bandage shown in Figure 10, in which the pleated overlapped tie tapes are slit longitudinally to thereby provide additional tie tapes;

Figure 12 is an isometric view showing the method of folding the tie tapers after having been slitted;

Figure 13 is a sectional view showing how the end of the tie tape is first secured to the end of the bandage;

Figure 14 is a sectional view taken along the line 14—14 in Figure 12 showing the binding and tie tape construction of the completed bandage;

Figure 15 is a transverse sectional view taken along the line 15—15 in Figure 10.

Referring more particularly to the drawings, (Figures 1 to 5 inclusive) the numeral 10 de-

notes an elongated bandage strip or body portion which is usually formed from a layer of non-absorbent material 11 and another layer of absorbent material 12 such as cotton or the like. The top and bottom of the assembled layers 11 and 12 have gauze coverings 14 and 15 respectively, the side edges of said gauze coverings being seamed as at 16 and 17 to form a tubular member. When the tubular member is first formed, the seams 16 and 17 are disposed inwardly from the side edges and therefore, each covering 14 will have a projecting selvage 14a beyond each seam line 16 and 17, and likewise each edge of gauze covering will have a projecting edge 15a beyond these seam lines.

Since the cover 14 is adapted to be positioned adjacent the wound, it is usually necessary for it to be made of a higher grade material than the cover 15 and the other side of the bandage. Therefore, by employing a two-piece tubular member, the cost of manufacture may be materially reduced without affecting the quality of the finished product.

If desired, the cover 14 can be made of absorbent material since it is adapted to be placed in contact with the wound surface, whereas, the cover 15 can be made of non-absorbent or even water repellent material to prevent external moisture from penetrating the bandage and infecting the wound.

It will be noted in Figure 2 that the edges 14a and 15a are disposed on the inside of the tubular covering. These edges are directed to this position during manufacture by a special process and apparatus shown and described in my co-pending patent application, Serial No. 467,351, filed November 30, 1942. It might be stated, however, that the edge portions 14a and 15a are initially on the outside when the tubular member is formed, but when the layers 11 and 12 are inserted, the tubular member is simultaneously inverted so as to place the edges 14a and 15a also on the inside.

It will be further noted that the edges 14a and 15a both project away from the gauze covering 14 and away from the layer of absorbent material 12. In other words, the edges 14a and 15a are disposed alongside the covering 15 and substantially in parallel relation thereto. By thus positioning the edges 14a and 15a within the tubular covering, the edges will be farther removed from the contact cover 14 of the bandage. It is, of course, realized that the gauze covering 14 and the absorbent layer of material 12 should be disposed adjacent the wound or injury; consequently, layers 11 and 12, as well as cover 14, will shield the wound from any injury or discomfort which might be produced by edges 14a and 15a.

Another important factor in the construction of the present bandage is in the direction in which the fibers in the layers 11 and 12 project. The fibers in each of the layers 11 and 12 are combed during the carding operation so as to extend longitudinally of the bandage. These fibers are all therefore substantially parallel and, consequently, when the bandage is compressed for shipment, the compression can be directed with relation to the fibers in such a manner that the least possible permanent creasing will be produced. The compression of the present bandage and the mechanism therefor is shown and described in my co-pending patent application, Serial No. 467,354, filed November 30, 1942.

When the body portion 10 of the bandage is formed, suitable transversely disposed spaced marks 18 are placed on the face of contact gauze covering 14. These marks are located apart from each other a distance substantially the length of a completed bandage 19 and thus, serve to indicate the position where the body portion is to be cut, as well as where the securing means for individual bandage are to be attached.

One of the most convenient methods of attaching a bandage to a patient's body is by means of suitable flat elongated tie tapes. These tie tapes may be employed for encircling a limb of the patient's body and for quickly securing the bandage in place over a wound. It is to be understood, however, that other means may be employed such as adhesive tapes, strings, pins, or the like without basically departing from the spirit of the invention.

In Figure 3 two tie tapes 20 are shown secured to the end of the bandage 19 nearest the observer by a seam line 21. These seam lines are parallel to indicating marks 18 but spaced a slight distance inwardly of the bandage therefrom, and serve to close the ends of the bandage as well as to secure the tie tapes thereto. It will be noted that the tie tape 20 extends longitudinally over the top of bandage 19 and is secured again to the body portion on each side of mark 18 by means of a pair of parallel rows of stitches 21. These stitches, if desired, may be formed by a double-needle sewing machine or in any other suitable manner, but after the stitches have been formed, the body portion 10, as well as the tie tapes 21, are severed along line 18 approximately midway between the rows of stitches 21 to thus sever a bandage unit 19 from the portion 10. Of course, after this bandage unit is severed, both cut ends will appear substantially the same as the near side of Figure 3.

It will be further noted by observing Figure 3 that each tie tape 20 is folded upon itself a plurality of times to form spaced batches 22. In fact, there are two such batches 22 in each tie tape 20, said batches being connected by a short strip of material 22a. Also these batches of material are releasably held together by any suitable means such as tack stitches 23, or the like. When the bandage unit 19 has been secured as above described, each tie tape 20 has the ends thereof secured to the ends of the bandage unit and also has its intermediate portion 22a unsevered. Then the portion 22a is severed to form two tie strips 20a from each strip 20, and at this stage, each tie strip 20a will have its end formed into a batch 22.

The next step comprises the binding of the ends of the unit 19 to complete the bandage. This binding also serves to additionally secure the tie strips 20a to the ends of the bandage as well as to bind the loose fiber upon the cut ends of the bandage. Figure 5 shows the binding and tie strip construction in detail. A piece of binding material 27 is folded over the end of the bandage unit 19 and over the end of the secured tape 20a. Then, the material 27 is secured to the end of the bandage and to the tapes 20 by means of a second line of stitches 28, thereby forming a rectangular bandage having all four edges completely covered, and having the tie strips folded together in batches so that the same will occupy a minimum amount of space when handling the bandage.

Figures 6 to 9 inclusive show another form of surgical bandage 30 which is similar to the preceding form except as to the manner in which the tie tapes are attached to the bandage ends.

Therefore, parts in this form of the invention which are identical to parts in the preceding form will be given similar reference characters and only a description will be made of the parts which materially differ in construction.

Specifically the difference in the present form of the invention resides in attaching the ends of each tie tape to the end of the bandage by means of two separate seam lines, and in having that portion of the tape between the two seam lines encircling the raw end of the bandage. By observing Figure 7, it can be seen that the end of tie tape 31 is first attached to the bottom side of the bandage structure by means of seam line 21. In the preceding form, the tape is attached in a similar manner except it is attached only on the top side of the bandage. The next step in the formation of the present bandage 39 is to wrap the attached tape 31 around the end of the bandage to the top side and over the seam 21. After this has been done, the binding material 27 is employed to encase both the end of the bandage and portions of the above-named tapes 31 in the manner shown in Figure 8. Then a second seam line 28 is employed for securing the binding in position on opposed sides of the bandage, and also for additionally securing the end of each tape to the end of the bandage.

This type of construction is particularly valuable where the strength of the tie tape is limited. In some cases a very thin mesh gauze is employed as a tie tape, and consequently, much difficulty is obtained in providing a dependable connection to the bandage. By causing one end of each tie tape to encircle the raw end of the bandage, and then securing the tape on opposed sides of the bandage by a pair of stitch lines, the connection is made more dependable, and therefore, the likelihood of the tie tape pulling loose is very much reduced.

In all forms of the invention, attention is called to the fact that the tie tapes are so attached to the bandage that they will form a continuation of one face of the bandage when in use. In other words, if the tie tapes on the opposed ends of the bandage are pulled in opposite directions, the tie tapes and one face of the bandage will lie substantially in the same plane. This is a very important feature, because it presents a uniform smooth contact surface against the patient's body when the bandage is applied to a wound, and thereby eliminates any ridges or objectionable formations in the contact area.

To further illustrate this feature, attention is called to Figure 9. In this figure the dotted outline of a patient's limb is designated by the reference character 35, and around this limb a bandage 39 is applied. The distended tie tape 31, that is, the unfolded batches 23, are used to hold the cover material 14 of the bandage in contact with the surface of limb 35 and suitable knots or bows 31a are employed for uniting the ends of the tie tapes. It is clearly evident that the objectionable ridges or ends of the bandage, around which the binding material 27 is placed, are positioned away from the surfaces of the limb and are thereby prevented from being a source of annoyance when the bandage is applied. On the other hand, the pressure exerted upon the surface of the limb 35 is necessarily uniform throughout the entire area of the bandage and also throughout the engaging area of tie tapes 31, because the tie tapes are a continuation of contact face 14.

Figures 10 to 14 inclusive show still another modified form of bandage 38, and also illustrates a new method of producing the same. In this form of the invention, a layer of absorbent material 39 is placed upon a layer of non-absorbent material 40, and the two materials are encased within a tubular fabric 41. This tubular fabric is preferably formed from a single sheet of gauze material, which is shown and described in my copending application, Serial No. 467,351, filed November 30, 1942.

During the formation, however, the edges of the sheet material 41 are sewed together by a seam 42 at a substantial distance from the overlapped edges of the fabric, thus providing outwardly projecting edges 41a which are similar to the edges 14a and 15a described in connection with the first form of the invention.

The tubular member is then turned while the layers of material 39 and 40 are inserted therein, thereby placing edges 41a on the inside. Likewise, the edges 41a extend away from the absorbent material 39 and away from the contact side of the cover material 41, so that the edges will not irritate the patient's body when the bandage is applied to the wound.

The first step in the formation of this bandage comprises the attachment of one end of a broad tie tape 43 to the opposed cut ends by means of a seam line 44 in the manner shown in Figure 13. The bandage may be cut to a predetermined length before attaching the broad tie strip 43, or, if desired, by a special process, the severing of the bandage and the attaching of the tape strips 43 by the seam may be done all in one operation. Each of these broad strips 43 has the unattached end thereof folded to form a batch 45, said batch being releasably secured in a unit by means of quickly removable tack stitches 46 or some other similar manner.

After the first attaching operation of the tie strips has been performed as illustrated in Figure 13, each strip is wrapped around the cut end of the bandage 38 and over the top of the bandage until seam 44 is covered. At this time, a piece of binding material 47 is wrapped around the end of the bandage and the attached end of the tape material 43 in a manner shown in Figure 14. The binding material and the tape 43 are then secured in position upon the cut end of the bandage by means of a second stitch line 48.

If desired, both tie strips 43 may be in one continuous length with its ends first attached to the bandage structure in the manner shown in Figure 3. Then the intermediate portion of the attached strip may be reversed to the opposite side of the bandage to cause the cut ends to be encircled by the ends of the strip, after which the binders may be placed in position in the manner just described. If this latter method is used, it will be necessary to sever the continuous bandage strips approximately midway between the seams 48 and batches 45 to thereby form a tie strip construction, such as shown in Figure 10.

The next step in forming a bandage of this type is in the provision of additional tie strips. In other words, it is desirable to have four tie strips attached to the bandage, two at each end, so as to effectively secure the bandage to the patient's body. In order to quickly provide these additional strips the two batches on the respective broad tie strips 43 are placed side by side and in an extended position from the body of the bandage itself, in a position substantially as shown in Figure 11. Then the batches 43 and

the associated tie strips are slit longitudinally substantially along dotted lines 49, thereby forming four tie strips 43a, each tie strip having a folded batch 45a on the end thereof which batch has its folds releasably secured together by a portion 46a of the tack stitch 46.

This severing operation may be produced in a number of ways such as by bringing the material into engagement with a rotary knife 50 or some other similar cutting implement.

When the tie strips have been formed in the manner shown in Figure 11, the bandage is again straightened to a substantially flat position and then two superposed batches 45a of tie strips 43a are folded longitudinally in one direction upon the bandage and the remaining superposed batches of tie strips are folded in the opposite direction, thereby providing a better distribution of the tie strip material which facilitates subsequent packing and compressing operations.

In the drawings and specification, there has been set forth a preferred embodiment of the invention and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A surgical bandage comprising a rectangular flat piece of absorbent material, a tubular gauze encasing said absorbent material, said gauze having at least one longitudinal lap seam therein disposed inside the tubular gauze adjacent the side edge of the flat absorbent material, the projecting edges of said lap seam being positioned in parallel relation to each other alongside one of the inner walls of the tubular member, and in substantially parallel relation to the inner surface of the tubular member, said bandage having a plurality of tie tapes each comprising an accordion folded portion having its folds releasably secured together and having an elongated unfolded portion extending from the batch of folds and having its free end secured near the end of the bandage and on the surface of the bandage which is applied to the wound, so that due to the tension exerted by the tie tapes, on the surface next to the wound, when the bandage is secured to the wound surface by the tie tapes all wrinkles and the like will be eliminated.

2. A surgical bandage comprising a rectangular flat piece of material, said material including an absorbent and non-absorbent filler pad, a tubular gauze encasing said piece of material, said gauze having at least one longitudinal lap seam therein disposed inside the tubular gauze adjacent the side edge of the flat absorbent material, the projecting edges of said lap seam being positioned in parallel relation to each other alongside one of the inner edge walls of the tubular member and in substantially parallel relation thereto, a tie tape secured to each end of said tubular gauze and on the surface of the bandage which is to be applied next to the wound, and a binder encasing one end of the tie tape and each end of said tubular gauze and said material, each of said tapes being accordion folded and the folds being releasably secured together and when extended, being substantially in alinement with and forming a continuation of the face of said absorbent pad which is to be applied next to the wound, whereby the tension of the tie tapes on the surface of the bandage next to the wound, will remove all wrinkles in the surface of the bandage positioned against the wound.

3. A surgical bandage comprising a substantially flat piece of absorbent material, a tubular gauze encasing said absorbent material, said tubular gauze having the ends thereof substantially flush with the ends of the absorbent material, a tie tape attached to each end of said tubular gauze on the surface of the bandage which is to be applied next to the wound, and a binder encasing one end of the tie tapes and each end of the tubular gauze and absorbent material, each of said tapes when extended being in alinement with and forming a continuation of the face of the bandage which is to be applied next to the wound, and being folded back and forth upon itself to form a batch, and means for releasably securing the folds in said batch together the tension exerted by the tie tapes when the bandage is applied to a wound removing all wrinkles in the surface of the bandage which is next to the wound.

4. A surgical bandage comprising a substantially flat piece of absorbent material, a tubular gauze encasing said absorbent material, said tubular gauze having the ends thereof substantially flush with the ends of the absorbent material, a tie tape attached to each end of said tubular gauze, a binder strip encasing each end of the bandage and the end of the tie tapes secured thereto, the unsecured end of each tie tape being folded back and forth upon itself to form batches, means for releasably securing the folds of said batches together, the point of attachment of the tie tapes to the bandage being on the surface of the bandage which is to be applied next to the wound whereby when the bandage is applied the tension of the tie tapes will remove all wrinkles from the surface next to the wound and the ends of the bandage will not be pressed into the flesh surrounding the wound.

5. A surgical bandage comprising a substantially flat piece of absorbent material, a tubular gauze member encasing the absorbent material, and a plurality of flat tie tapes sewed near each end of the bandage onto the surface of the bandage which is to be applied next to the wound by a line of stitches and extending from the ends of said bandage, each of said tapes being folded back and forth upon itself to form a batch, said tie tapes serving as the sole means for attaching the bandage to the body of a patient, and also serving to exert tension on the surface of the bandage which is next to the wound to remove wrinkles and the like therefrom.

6. A bandage comprising a tubular gauze member and a filler of absorbent cotton, a pair of tie tapes secured to each end of the bandage, the tie tapes being folded around the ends of the bandage in the form of a binder, a binder strip covering each end of the bandage and the folded ends of the tie tapes disposed around the end of the bandage, a seam penetrating the binder and the tie tapes and the bandage to secure the tie tapes in position, each of said tie tapes having its free end formed into a plurality of accordion folds which are adapted to rest on one side of the bandage the point of attachment of the tie tapes nearest the accordion folded portion being on the surface of the bandage which is to be applied next to the wound, whereby when applied to a wound, the tie tapes will exert tension on the surface next to the wound to remove all irregularities in contour therefrom.

7. A surgical dressing having a tubular gauze covering and a filler, a binder strip enclosing each end of the tubular covering, and tie tapes having one of their ends secured between one

edge of the binder strips and the tubular covering on the surface of the bandage which is to be applied next to the wound, whereby when applied to a wound, tension will be exerted on the surface next to the wound to remove all irregularities of contour from the surface.

8. A surgical dressing having a tubular gauze covering and a filler, a binder strip enclosing each end of the tubular covering, and tie tapes having one of their ends secured between one edge of the binder strips and the tubular covering on the surface of the bandage which is to be applied next to the wound, whereby when applied to a wound, tension will be exerted on the surface next to the wound to remove all irregularities of contour from the surface, said tie tapes being accordion folded and releasable means for securing the folds against unfolding.

9. A surgical bandage having a covering fabric and a filler, binder strips encasing the ends of the covering fabric, accordion folded tie tapes having one end disposed between the binder strips and the covering, and a line of stitches penetrating the binder strips, the tie tapes, the covering and the filler, whereby the tie tapes when unfolded will project from the ends of the bandage in a plane substantially parallel to one surface of the covering which is to be applied next to the wound and will apply tension to the surface next to the wound to smooth all wrinkles therefrom.

10. A surgical dressing having a tubular gauze covering and a filler, a binder strip enclosing each end of the tubular covering, and tie tapes having one of their ends secured between one edge of the binder strips and the tubular covering on the surface of the bandage which is to be applied next to the wound, whereby when applied to a wound, tension will be exerted on the surface next to the wound to remove all irregularities of contour from the surface, said tie tapes being accordion folded and releasable means penetrating the folds for securing the folds against unfolding.

WILLIAM D. YOUNG.