

[54] **BANDAGING MEANS**

[76] Inventor: **Ernst Karel Klatte**, 9 Noolseweg,
Laren, Netherlands

[22] Filed: **Nov. 17, 1970**

[21] Appl. No.: **90,372**

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Primary Examiner—Richard A. Gaudet
Assistant Examiner—J. Yasko
Attorney—Snyder and Butrum

[30] **Foreign Application Priority Data**

Nov. 20, 1969 Great Britain.....56,829/69

[52] U.S. Cl.....**128/171, 128/157**

[51] Int. Cl.....**A61f 13/00**

[58] Field of Search.....128/171, 156, 157, 169, 165,
128/166; 66/192, 193, 172

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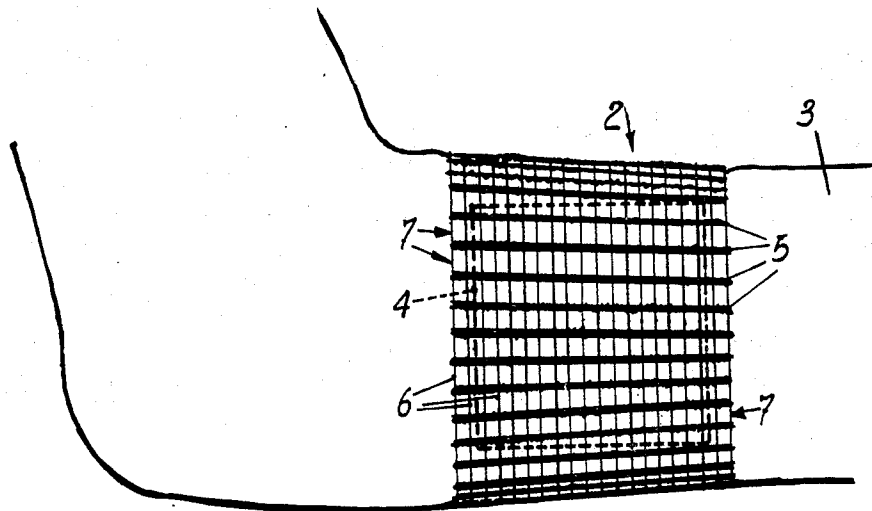
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[57] **ABSTRACT**

A bandaging means for retaining dressings in place comprises a tubular fabric of special open mesh structure. Row of chain stitches made from non-elastic yarn extend in axial direction of the fabric, and elastic yarns are each arranged in reciprocating fashion between two successive rows of chain stitches and linked therewith so as to form between those two rows of chain stitches, on tensioning of the fabric, a line of trapeziums alternately inverted in relation to each other. The two parallel sides of each trapezium are formed by the rows of chain stitches and the other two sides are formed by the elastic yarn.

5 Claims, 4 Drawing Figures



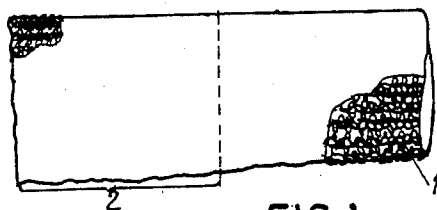


FIG. 1

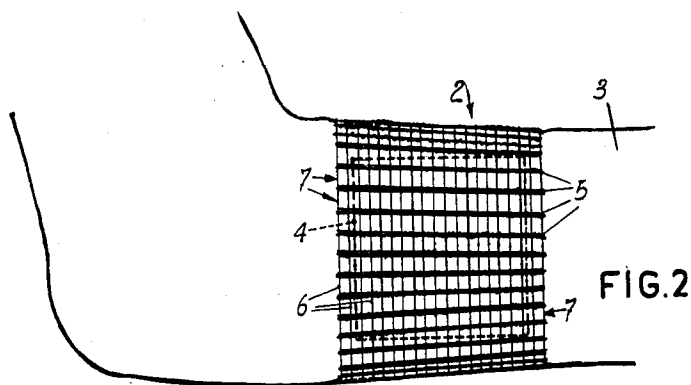


FIG. 2

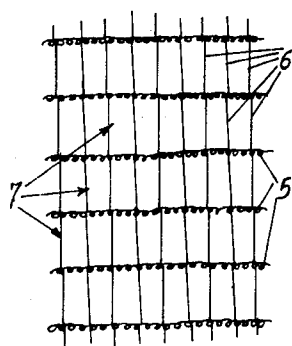


FIG. 3

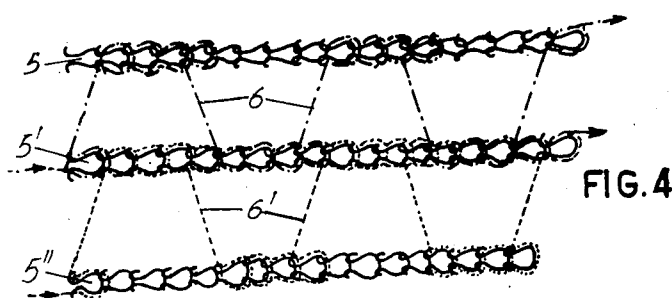


FIG. 4

INVENTOR

ERNST KAREL KLATTE

BANDAGING MEANS

This invention relates to bandaging means for retaining dressings in place, said means comprising a tubular fabric having an improved and very advantageous open mesh structure.

It has been common practice to keep medical dressings such as gauzes in place by means of long bands but such bands are often difficult to apply and may also be tiresome and irritating to the wearer because in most cases they are fastened either too loose or too tight.

Recently, there has been disclosed a bandaging means adapted to overcome the disadvantages of the aforesaid bands. Such bandaging means comprises a tubular fabric which may have the form of a garment such as a vest or shorts and which is characterized by an open mesh structure which renders it elastically stretchable. This mesh structure comprises a set of non-elastic yarns extending in axial direction of the fabric and a set of elastic yarns each arranged in zig-zag fashion between two successive non-elastic yarns and linked therewith. The linkage is such that, on tensioning of the fabric a line of alternately inverted triangles is formed of which the non-elastic yarns form the bases and the elastic yarns form the two other sides. This bandaging means may easily be applied to the human body thanks to its stretchability and may be worn without many troubles as a result of its open mesh structure whilst it will retain medical dressings in place. There is, however, a certain tendency for this bandaging means to ride up or slip off during use when worn on body parts normally subject to repeated bending and stretching movements.

It has now been found that the aforesaid bandaging means may be improved by selecting an open mesh structure of different construction. If the non-elastic yarns are formed as rows of chain stitches and if the elastic yarns are linked therewith in such a way that they constitute, on tensioning of the fabric, a line of trapeziums in stead of triangles, it appears that the stretchability of the tubular fabric in radial direction is considerably increased and that the number of non-elastic yarns in a fabric of given size may be reduced substantially if the same stretchability as before has to be obtained. Thus, for example, a tubular fabric of the new mesh structure comprising 48 rows of chain stitches has the same stretchability in radial direction as a tubular fabric of known construction comprising 68 non-elastic yarns. This means that less material is required for obtaining the same stretchability so that savings in price and a better porosity of the fabric are reached. Moreover, it appears that the stretchability of the fabric in axial direction is also increased and that, as a result thereof, the tendency of the fabric to ride up or slip off has substantially been eliminated.

The invention has for its object to provide bandaging means for retaining dressings in place, said bandaging means comprising a tubular fabric of improved open mesh structure.

This and other objects are reached by the invention which provides bandaging means for retaining dressings in place, comprising a tubular fabric of open mesh structure, said fabric comprising a set of rows of chain stitches made from non-elastic yarn extending in axial direction of the fabric, and a set of elastic yarns

each arranged in reciprocating fashion between two successive rows of chain stitches and linked therewith so as to form between said two rows of chain stitches, when the fabric is tensioned, a line of trapeziums alternately inverted in relation to each other, the two parallel sides of each trapezium being formed by the rows of chain stitches and the two other sides being formed by the elastic yarn.

Preferably, the form of the trapeziums is such that each of them approaches a rectangle when the fabric is tensioned. This may, e.g., be reached by giving the basis of each trapezium only a length of five chain stitches when the upper side thereof has a length of three such stitches. It results in maximum stretchability of the fabric without loss of structural strength and coherence. Further, the stitches of the thus formed fabric of the invention has less possibility to run than in the known construction due to better fixation through the elastic yarns.

The bandaging means according to the invention may be manufactured in several sizes dependent from its use. Incisions in the tubular fabric may be made just prior to utilization in order to adapt it to the special form of a body part to which it has to be applied. Thus, a pair of incisions near one end of a tubular fabric of rather wide size may make it appropriate to function as a vest when worn; other adaptations may easily be found by the user.

The invention is illustrated by the drawing which shows an embodiment thereof by way of example.

FIG. 1 shows a bandaging means of the invention in free, unstretched form.

FIG. 2 shows the bandaging means of FIG. 1 after stretching and applying to part of a human arm.

FIG. 3 shows the open mesh structure of the fabric used in the bandaging means of FIGS. 1 and 2 on a larger scale.

FIG. 4 shows a detail of the structure of FIG. 3 on a still larger scale.

The bandaging means of FIG. 1 comprises a tubular fabric 1 of given size and length which is shown in flat, unstretched form. Prior to use, a piece 2 of shorter length may be cut thereof for applying to a part of the human body, if not the whole length is required.

In FIG. 2, the piece of fabric 2 has been stretched and applied to part of a human arm 3 in order to retain a gauze 4 in place. This stretching and applying has caused no troubles thanks to a special open mesh structure of the fabric which has now become clearly visible in FIG. 2 and is shown on a larger scale in FIG. 3. Like apparent from these figures, the open mesh structure is formed by parallel rows 5 of chain stitches made from non-elastic yarns extending in axial direction of the fabric and by a set of elastic yarns 6 linked therewith. Each elastic yarn 6 is arranged in reciprocating fashion between two successive rows 5 of chain stitches and is linked therewith in such a way that (in tensioned state of the fabric) a line 7 of trapeziums is formed. The whole fabric accordingly comprises a plurality of such lines 7 each extending in axial direction of the fabric. The trapeziums in each line 7 have their bases alternately formed by one and by the other of the two boundary rows 5 of chain stitches so that they are alternately inverted to each other.

This special open mesh structure on the basis of non-elastic and elastic yarns will render the tubular fabric 2 highly stretchable so that it may be stretched with ease on both hands of the applier who extends it so much that it can easily be brought over the limbs (head, knee, etc.) of the patient and applied thereto. Yet this stretchability is elastic so that the fabric will follow the contours of a body part after being applied to it and will retain any dressings firmly in place without moving, this fabric neither riding up nor slipping off. In comparison with a similar fabric having a mesh structure of open triangles formed by elastic and non-elastic yarns, it will have a higher elastic stretchability in radial direction (amounting in some cases to 25 percent or 32 percent increase) and/or a smaller number of non-elastic yarns (rows of chain stitches) per unstretched unit of radial width. Further, the fabric of FIGS. 1-3 will also have a higher elastic stretchability in axial direction (amounting in some cases to 37 percent or 42 percent increase which is responsible for the non-riding up characteristic).

It will be apparent from FIG. 3 that the trapeziums in the embodiment shown will approach rectangles in form when the fabric is tensioned. The way in which such trapezium forms are obtained may be seen in FIG. 4 which gives a detail of the fabric of FIG. 3 on a still larger scale. Like shown in FIG. 4, an elastic yarn 6 is reciprocating between two rows 5,5' of chain stitches and linked therewith in such a way that the basis of each resulting trapezium has a length of five chain stitches whilst the upper side thereof has a length of three chain stitches. Another elastic yarn 6' is reciprocating between the rows 5',5'' of chain stitches and linked therewith in quite the same way. Such a fabric, wherein the trapeziums on tensioning approach rectangles, will have optimum elastic stretchability in radial direction because the non-parallel sides of the trapeziums will approximately extend in radial direction of the fabric whereas the sides of the triangles in the known construction clearly extend obliquely thereto. Further, such a fabric will also have optimum elastic stretchability in axial direction because it can be seen from the middle row 5' of FIG. 4 that elastic yarn is present in every stitch of a row of chain stitches therein. Nevertheless, the fabric will retain its structural strength and coherence due to the linkage between elastic and non-elastic yarns.

The fabric according to the invention may be manufactured on a knitting machine by using non-elastic yarns as warp yarns for forming rows of chain stitches and by using elastic yarns as weft yarns for making the special open mesh structure of the invention. The non-elastic yarns may be made of cotton or the like and the elastic yarns may be of rubber or synthetic elastomers and may be bare or covered.

Comparative measurements were made on bandaging means of the invention and bandaging means of the prior art in which the fabric has an open mesh structure of triangles. For several sizes of both types of fabric, the unstretched flat width, the maximum radial stretch and the number of non-elastic yarns (rows of chain stitches) in each fabric were measured and compared. The results are listed in Table 1 wherein each column A comprises the values for a triangled mesh structure and each column B gives the values for an open mesh struc-

ture of alternately inverted trapeziums according to the invention.

TABLE 1

Size no.	Unstretched flat width (mm)		Maximum radial stretch (cm)	Number of non-elastic yarns	
	A	B		A	B
0	0	6	8	9.57	6
1	1	20	12	21.21	18
3	3	27	20	33.533	26
5	5	36	28	46.36	34
6	6	66	55	78.71.5	68

It appears from this table that with comparable size numbers, the invented bandaging means has a higher elastic stretchability in radial direction and/or a smaller number of non-elastic yarns per unstretched unit of radial width.

Further comparative measurements were made to determine the stretchability in axial direction of both types of bandaging means. For several sizes of both types, the unstretched length and maximum stretched length of a piece of fabric were measured and compared. The results are listed in Table 2, wherein each column A again comprises the values for a triangled mesh structure and each column B gives the values for an open mesh structure of alternately inverted trapeziums according to the invention.

TABLE 2

Size no.	Unstretched length (cm)		Maximum stretched length (cm)	
	A	B	A	B
0	0	10	10	19
1	1	10	10	19
3	3	10	10	19
5	5	10	10	17
6	6	10	10	18

It appears from this table that, with comparable size numbers, the invented bandage means also has a higher elastic stretchability in axial direction than the bandaging means of the prior art. This will result in a substantial elimination of the tendency of the fabric to ride up or slip off when worn upon a body part (e.g., an arm or knee) that is normally subject to repeated bending and stretching movements during use.

It will be apparent to those skilled in the art that the tubular fabric of the invention may be manufactured in several sizes and several lengths, dependent from the users' demand. Should it be necessary to apply the fabric to special body parts like a head, the upper part of a trunk etc. then incisions may be made by the user to adapt the fabric to the special form of the body parts.

It will further be apparent that the invention is not limited to the embodiment as shown but that any other embodiments are possible within the scope of the invention.

The bandaging means of the invention have the advantage that they will retain dressings in place, yet allowing free movement of the wearer's limbs and that, in the case of less radial rows of non-elastic yarns, they are more porous than the bandaging means of known construction. They are easier to apply because of better radial stretchability, and will neither ride up nor slip off because of better axial stretchability, whilst savings in material may be reached in relation to the known bandages.

What I claim is:

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1. Bandaging means for retaining dressings in place, comprising a tubular fabric of open mesh structure, said fabric comprising a set of rows of chain stitches made from non-elastic yarn and extending in axial direction of the fabric, and a set of elastic yarns each arranged in reciprocating fashion between two successive rows of chain stitches and linked therewith so as to form between those two rows of chain stitches, when the fabric is tensioned, a line of trapezoids alternately inverted in relation to each other, the two parallel sides of each trapezoid being formed by said rows of chain stitches in which the number of loops in one row is greater by at least two than the number of loops in the second row and the other two sides being formed by said elastic yarn.

2. Bandaging means as claimed in claim 1, in which the form of said trapezoids is such that each of them approaches a rectangle when the fabric is tensioned.

3. Bandaging means as claimed in claim 1, in which the basis of each trapezoid has a length of about five chain stitches and the upper side thereof has a length of about three chain stitches.

4. A tubular bandage adapted to fit over a portion of the wearer's body to hold a dressing in place, said bandage comprising in combination:

an elongate tubular body capable of axial as well as

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radial stretching, said body being defined by a series of circumferentially spaced and generally parallel rows of stitching extending from one end of the body to the other, and an elastic yarn linking each adjacent pair of said rows of stitching;

each row of stitching being formed of an inelastic yarn defining successive chain stitch loops in which the loops in all of the rows are of substantially the same size;

each of said elastic yarns being connected between the two rows of stitching with which it is associated through axially spaced first groups of the chain stitch loops in each of such two rows, said first groups being axially spaced to define second groups of chain stitch loops in which the number of loops in each second group is greater by at least two than the number of loops in each first group, and the elastic yarns connecting said two rows to the next adjacent rows being connected through first groups of chain stitch loops which lie within the respective second groups of said two rows.

5. A tubular bandage as defined in claim 4 wherein there are three chain stitch loops in each first group and five chain stitch loops in each second group.

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