United States Patent [19]

Meyer

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[45] **July 24, 1973**

[54] **STRETCHABLE TUBULAR FABRIC**

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[52] **U.S. Cl.** **66/195**

[51] **Int. Cl.** **D04b 21/00**

[58] **Field of Search** 66/195, 193, 170, 66/169

[56] **References Cited**

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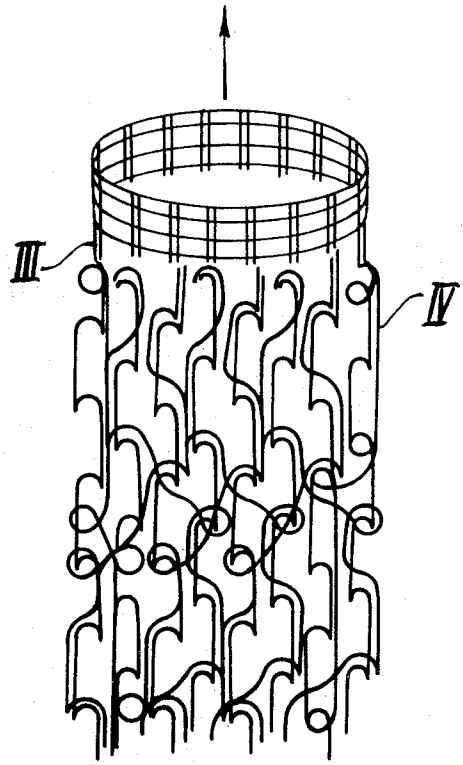
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Attorney—Eugene E. Geoffrey, Jr.

[57] **ABSTRACT**

A tubular stretchable fabric for use to bind surgical dressings, wounds and the like which includes a first plurality of relatively inelastic stitched warp threads and second plurality of relatively elastic weft threads with each thread being alternately interstitched with adjoining threads of the first plurality of threads to provide rectangular openings which enlarge when the fabric is stretched.

1 Claim, 7 Drawing Figures



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SHEET 1 OF 2

Fig. 1.

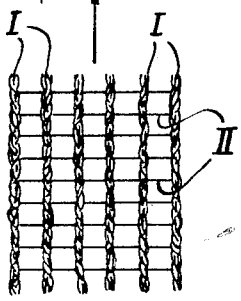


Fig. 3.

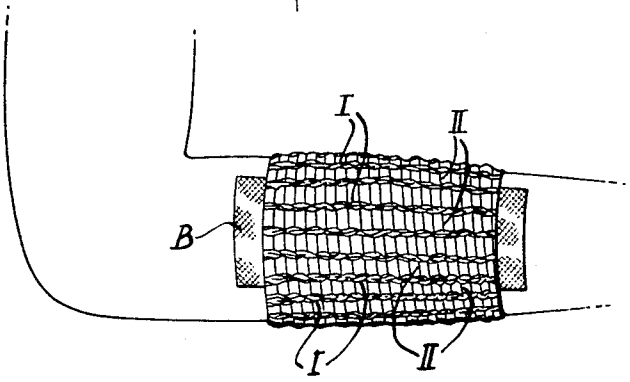


Fig. 2A.

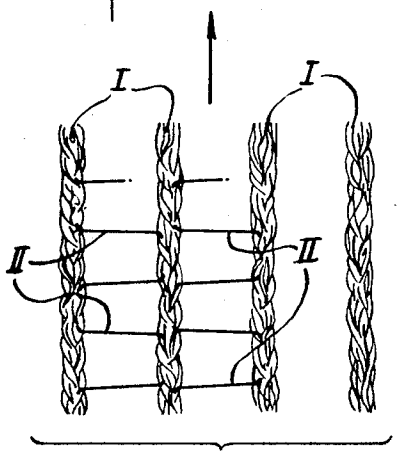
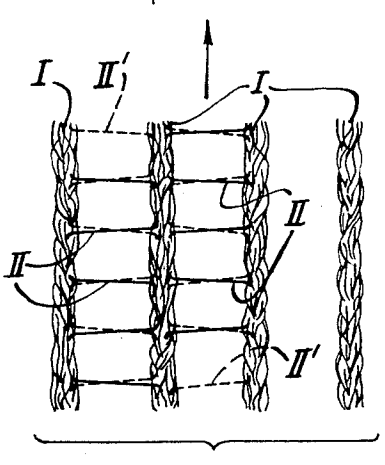


Fig. 2B.



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FIG. 4A

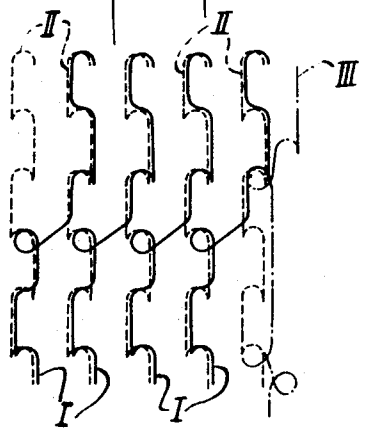
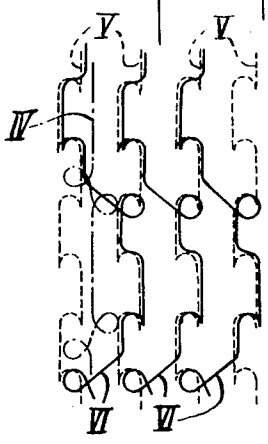
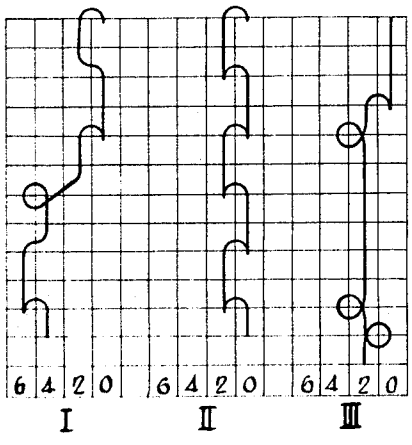


FIG. 4B





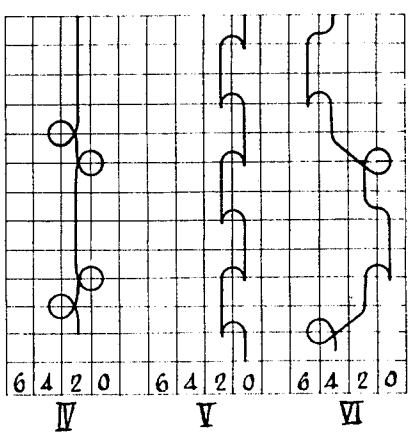
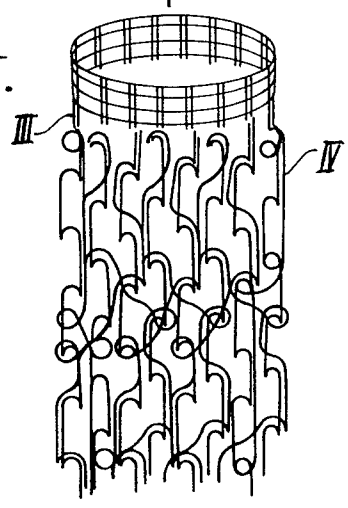


FIG. 5.



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STRETCHABLE TUBULAR FABRIC

This invention relates to stretchable fabrics and, more particularly, a tubular stretchable fabric useful, among other things, for binding surgical dressings or injured parts of the body.

Woven and knitted bandage fabrics have been heretofore suggested for use in covering bandages and protecting injured portions of the body, but known structures have not been found to be satisfactory for a number of reasons including insufficient elasticity and durability.

One object of the invention resides in the provision of a relatively stretchable and highly durable net-like fabric for covering and binding bandages in place or for covering and protecting injured parts of the body.

Another object of the invention resides in the provision of an improved stretchable tubular fabric which has an enlargeable array of net-like rectangular openings when the fabric is in use for improved airation of the affected area of the body being covered by the fabric and is flexible enough to allow free movement of parts of the body covered by the fabric and yet possesses sufficient tension to retain itself firmly in position.

These and other objects of the invention are achieved by providing a stretchable, tubular fabric which includes a first group of relatively inelastic warp threads and a second group of relatively elastic weft threads interstitched with the first group to provide an array of substantially rectangular openings which enlarge when the fabric is stretched and shrink when the fabric is released.

Various other objects and features of the invention will become more apparent from the following detailed description and the illustrative drawings.

In the drawings:

FIG. 1 is a plan view of a fragmentary section of stretchable fabric according to the invention in a state of rest with elastic weft threads joining the warp threads.

FIG. 2A is a plan view of a fragmentary portion of the fabric of FIG. 1 when in the stretched condition.

FIG. 2B is a plan view of a fragmentary section of a modified fabric in accordance with the invention which includes a second set of elastic threads to reinforce the first set of elastic threads.

FIG. 3 is a perspective view of the tubular stretchable fabric in position on an arm to hold a dressing in place.

FIGS. 4A and 4B are schematic drawings of the front and back halves of the tubular fabric knitted according to a stitching formula in accordance with the invention.

FIG. 5 is a schematic drawing of a section of the tubular stretchable fabric in accordance with the invention.

Referring to FIGS. 1-3 of the drawings, the tubular fabric comprises a group of relatively inelastic warp threads I stitched in like courses extending in an axial direction as indicated by the arrow and a group of relatively elastic weft threads II interstitched or knitted with adjoining pairs of the inelastic threads I in circumferential direction for providing an array of rectangular openings. As the fabric stretches the openings enlarge as shown in FIGS. 2A and 2B and retract and hold the bandage dressing in place when released over a part of the body such as the arm as shown in FIG. 3. The ability of the fabric to stretch and retract can be strengthened,

when necessary, by interknitting an additional set of stretchable threads II with adjoining courses of inelastic threads as generally shown in FIG. 2B.

FIGS. 4A, 4B and 5 illustrate a stretchable fabric according to the present invention knitted in a tubular form using the conventional Raschel Knitting Machine having front and back needle beds. The front and back needle beds include sets of needles threaded with the relatively elastic and inelastic threads to form the front and back halves of the knitted fabric. More specifically, as shown in FIGS. 4A and 4B, the front and back halves of the fabric may include a plurality of relatively inelastic warp threads II and V of a suitable plastic, such as a polyester or polypropylene, stitched in chains and running in the axial direction as indicated by the arrows and relatively elastic weft threads I and VI of a suitable natural or synthetic rubber interknitted with the adjoining chains of the inelastic warp threads II and V and a pair of elastic warp threads II and IV, each interstitching the two side edges, the front and back halves as shown in FIGS. 4 and 5. The fabric may be knitted in accordance with the following table which shows each cycle of the lapping formulas of various threads:

I	II	III	IV	V	VI
4	0	2	2	0	4
4	0	0	2	2	6
4	0	2	2	2	2
6	2	4	4	2	2
6	2	2	2	2	2
6	2	2	0	0	0
6	2	2	2	0	0
6	0	2	2	0	0
4		2	2		0
4		2	2		0
4		2	2		2
6		2	2		2
2		2	2		2
2		2	0		0
2		2	2		4
0		4	4		4
0		2	2		4
0		0	2		6
0		0	2		6
0		0	2		6
2		0	2		6
2		0	2		6
2		0	2		4
0		0	2		4

Various other modifications and changes may be made to the fabric of the present invention described above without departing from the spirit and scope thereof.

What is claimed is:

1. A stretchable tubular fabric formed by a warp knitting machine having front and back needle beds, said front needle bed including a first set of needles threaded with relatively inelastic threads stitched in chains in accordance with a lapping formula 0—0, 0-2, 2—2, 2-0 and a second set of needles threaded with relatively elastic threads to interknit adjoining chains being formed by said first set of needles in accordance with a lapping formula 4—4, 4-6, 6—6, 6—6, 4—4, 4—6, 2—2, 2-0, 0—0, 0—0, 2—2, 2—0 for forming the front half of the fabric, said back needle bed including a third set of needles threaded with relatively inelastic threads stitched in chains in accordance with a lapping formula 0-2, 2—2, 2-0, 0—0, a fourth set of needles threaded with relatively elastic threads to interknit adjoining chains being formed by said third set of needles in accordance with a lapping formula 4-6, 2—2, 2-0, 0—0, 0—0, 2—2, 2-0, 4—4, 4-6, 6—6, 6—6, 4—4, for forming the front half of the fabric, a first relatively elastic thread interstitching the two edges on

one side of the two halves of the fabric in accordance with a lapping formula 2-0, 2-4, 2—2, 2—2, 2—2, 2—2, 2-2, 2—2, 2-4, 2-0, 0—0, 0—0, 0—0, and a second relatively elastic thread interstitching the two

edges on the other side of the two halves of the fabric in accordance with a lapping formula 2—2, 2-4, 2-0, 2—2, 2—2, 2—2, 2-0, 2-4, 2—2, 2—2, 2—2, 2—2.

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