

(No Model.)

2 Sheets—Sheet 1.

W. H. PEPPER.
KNIT FABRIC.

No. 473,474.

Patented Apr. 26, 1892.

Fig. 1.

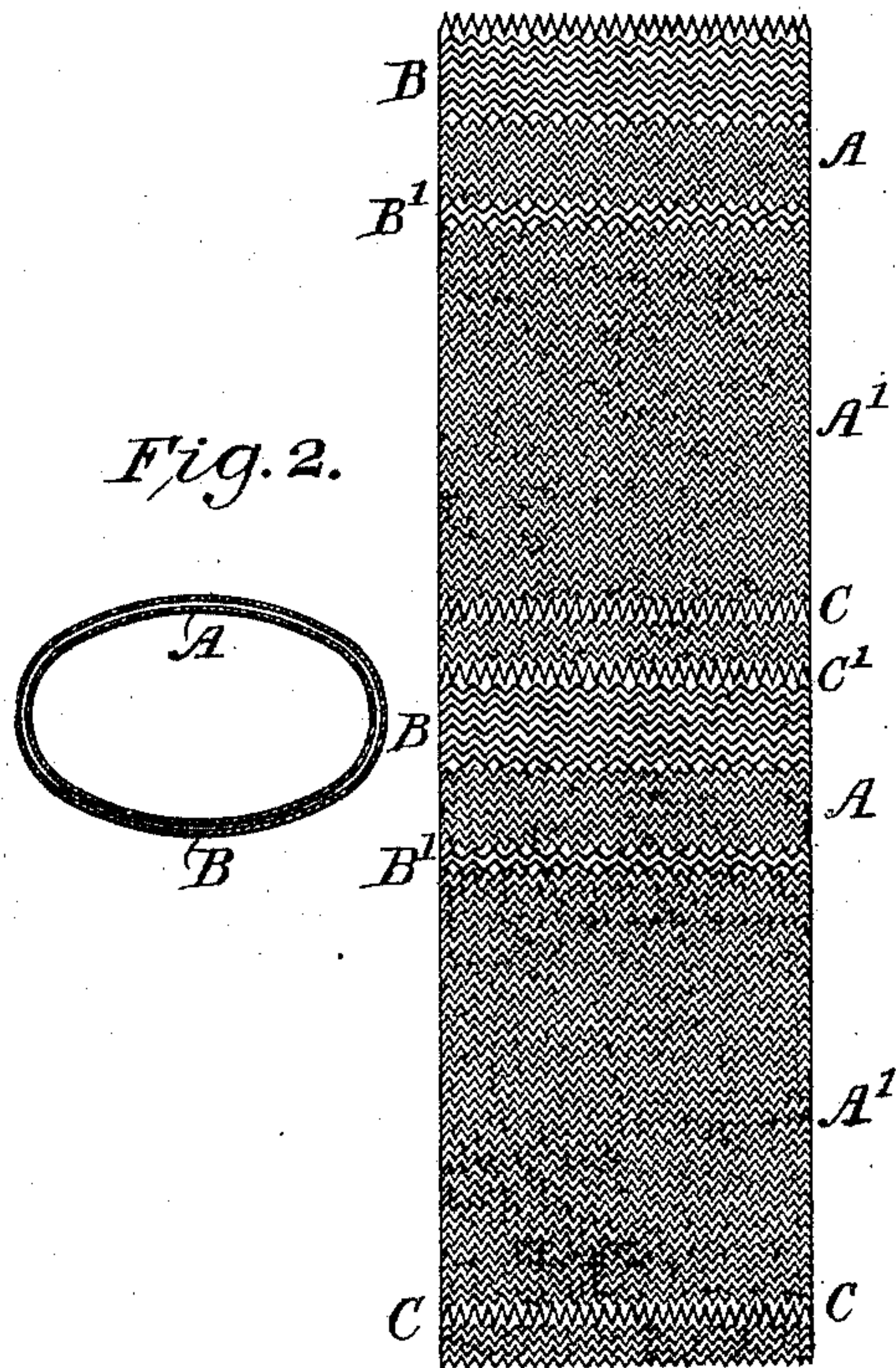


Fig. 2.

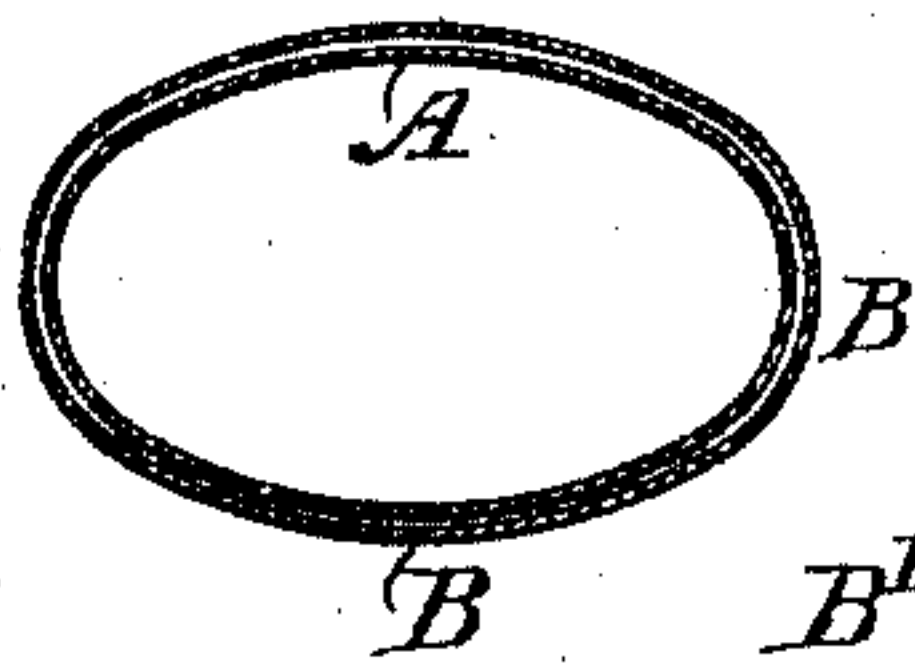


Fig. 3.



Witnesses

Jos. S. Latimer
Carlton E. Snell

Inventor

William H. Pepper

By his Attorney

Wm. H. Brown

(No Model.)

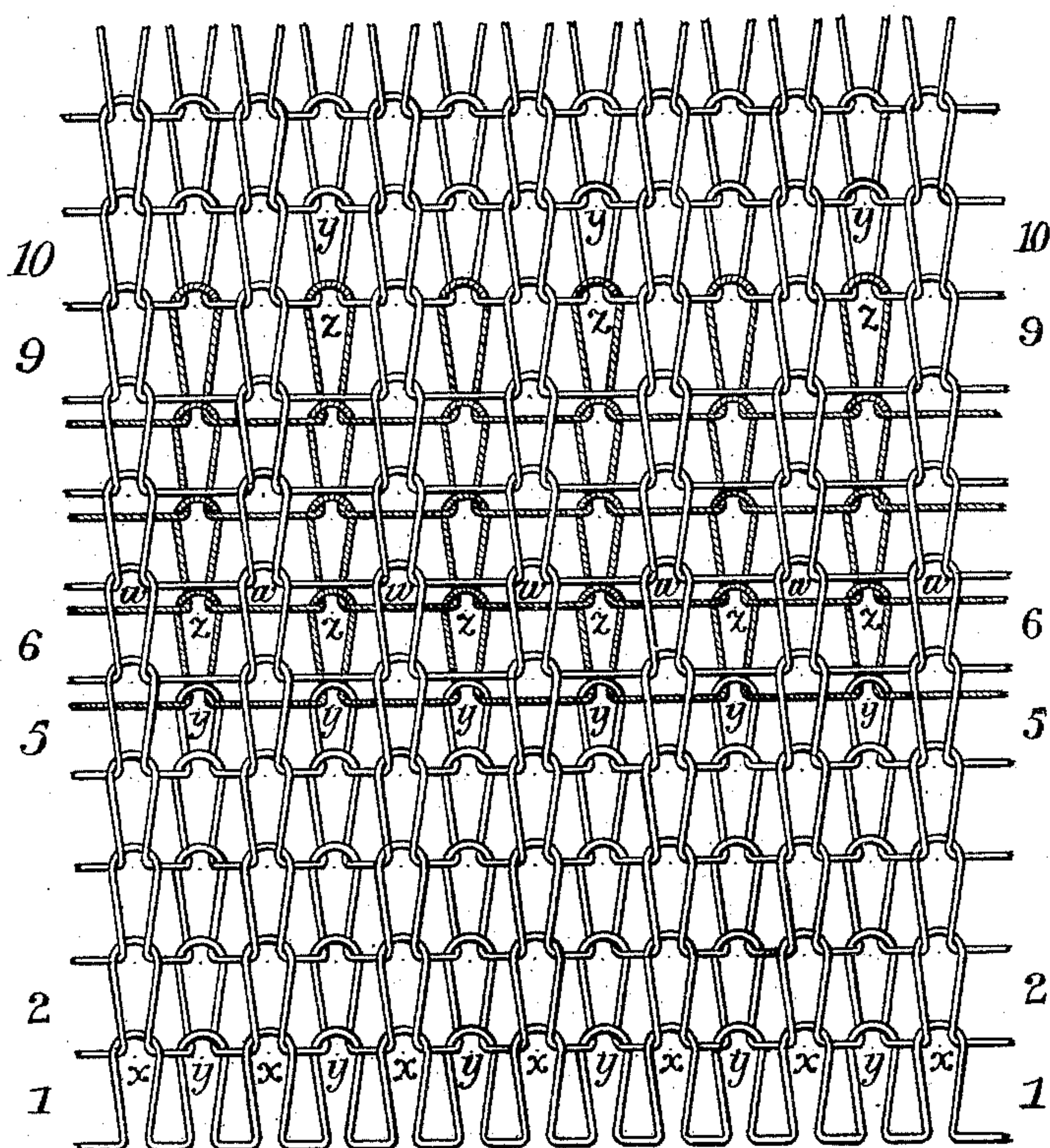
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Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM HENRY PEPPER, OF LAKE VILLAGE, NEW HAMPSHIRE.

KNIT FABRIC.

SPECIFICATION forming part of Letters Patent No. 473,474, dated April 26, 1892.

Application filed September 24, 1891. Serial No. 406,766. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY PEPPER, of Lake Village, in the county of Belknap and State of New Hampshire, have invented
5 a new and Improved Knit Fabric, of which the following is a specification.

The improved knit fabric which constitutes this invention is composed of alternate body portions and stripes or welts. Each body portion is composed of a single thread and of rib
10 stitches, while each welt or stripe is composed of an independent thread and of plain stitches. Each welt or stripe is backed by a backing which is composed of the same thread as the
15 body portions and is of plain stitches. Each welt or stripe and its backing are joined together only where both join with and merge into the ribbed body portions. The improved fabric may be knit by hand, but is preferably
20 knit upon a circular independent-needle knitting-machine having cylinder-needles and dial-needles, a proper machine for this purpose being set forth in Letters Patent of the United States granted October 20, 1891, No.
25 461,508, to myself, Albert T. L. Davis, and George A. Sanders.

The improved fabric is illustrated in the accompanying drawings, wherein—

Figure 1 is a view diagrammatic in character of the improved fabric. Fig. 2 is a cross-section thereof. Fig. 3 is a longitudinal section of a portion of the fabric. Fig. 4 is a detail view, on an enlarged scale, showing the formation and character of the stitches.

35 The main body portions A of the fabric are of the well-known "rib" stitch and contain in themselves no feature of novelty. These ribbed body portions of the fabric are conveniently knit upon a circular independent-
40 needle knitting-machine having cylinder and dial needles, such machines (as is well known) producing a ribbed tubular web or fabric; or such body portions may be knit by hand by the method of hand-knitting commonly known
45 as "purling." Certain features, however, of the well-known method of knitting the ribbed portions of the fabric and certain features of the ribbed portions themselves will be referred to, as they should be borne in mind in considering the novel and characteristic features
50 of the improved fabric. The ribbed body portions of the fabric are knit with a single

yarn or thread, so that each ribbed portion is of a uniform color throughout. The ordinary circular independent-needle knitting-
55 machine having cylinder and dial needles (such machines being, for convenience, hereinafter called "dial knitting-machines") for knitting a plain ribbed circular web are organized to knit with a single thread. This single
60 thread is operated upon by both the cylinder and the dial needles, the dial-needles being disposed between the cylinder-needles at proper intervals. In making a plain ribbed fabric of "one-and-one" stitches the dial-
65 needles alternate with the cylinder-needles. The formation of the stitches in a one-and-one ribbed fabric is indicated at the top and bottom portions of Fig. 4. Each of the ribbed
70 portions of the fabric is composed of vertical rows of loops $x x$, which alternate with vertical rows of loops $y y$. The loops x differ from the loops y in that each loop x in any horizontal row, as 1 1, passes first in front of and
75 then behind the two strands of the loop x in the horizontal row 2 2 immediately above, whereas each loop y in the horizontal row 1 1 passes first behind and then in front of the two strands of the loop y in the horizontal
80 row 2 2 immediately above. The thread or yarn, however, of which the loops $y y$ are formed is, it will be observed, a continuation of the same thread or yarn as that of which the loops $x x$ are formed. When such a
85 ribbed fabric as this is formed on a dial knitting-machine, the loops $x x$ are formed by the cylinder-needles and the loops $y y$ are formed by the dial-needles, (assuming that the fabric is viewed as it comes from the machine.) A tubular ribbed web or fabric thus formed
90 is old and well known in the art.

The main characteristic and novel feature of the present invention consists in the stripes or "welts" B B, which appear in the completed fabric at suitably-disposed intervals,
95 as indicated in Fig. 1. The formation of these stripes or welts will be best understood by referring to Fig. 4. In this figure the stitches constituting the stripe or welt are distinguished from the stitches which constitute the body of the fabric by being shaded.
100 Fig. 4 shows a portion of one of the stripes or welts. The stripe or welt is formed by a separate thread or yarn distinct from the

thread or yarn of which the body of the web or fabric is formed.

In case the fabric is made on a dial knitting-machine—such as is set forth in said Letters Patent No. 461,508—the knitting-cams, which actuate the dial-needles so as to cause them to co-operate with the cylinder-needles in knitting the ribbed portions A A, are thrown out of action, so that the dial-needles cease to knit upon the main thread or yarn simultaneously with the cylinder-needles. The knitting-cams which actuate the cylinder-needles, however, are not thrown out of action, so that the cylinder-needles still continue to knit with the main thread or yarn. Simultaneously with the throwing out of action of the knitting-cams, which cause the dial-needles to co-operate with the cylinder-needles in knitting the ribbed portions A A, a second set of knitting-cams is thrown into action, which causes the dial-needles to knit upon a second or welt thread or yarn that is fed to the dial-needles at a different point from where the main thread is fed to the cylinder-needles. This second thread forms the welt stitches or loops *z z*, which are distinguished by shading in Fig. 4. The dial-needles commence to knit with the welt-thread at the same time that they cease to knit with the main thread, so that the last row of loops or stitches which the dial-needles have taken from the main thread are still upon the dial-needles when they commence to take the welt-thread. Consequently the first row of the welt-stitches *z z* are interlocked with the last row of the stitches *y y*. The effect of this operation is clearly indicated in Fig. 4. The horizontal row 5 5 of the stitches *x* and *y* is the last row of the lower ribbed portion A. The stitches *y y* in this row 5 5 are the loops of the main thread left on the dial-needles when they cease to take the main thread, and the stitches or loops *z z* in the horizontal row 6 6 next above the row 5 5 are the first line of stitches which the dial-needles take from the welt-thread and they are interlocked with the stitches *y y* in the row 5 5. As the knitting then progresses the dial-needles continue to knit with the welt-thread, each succeeding row or round of the welt-thread loops or stitches being interlocked with the preceding row or round of the welt-stitches. None of the rows or rounds of the welt-stitches *z z* above the first row 6 6 (except as hereinafter stated) are interlocked with the loops *y y*, formed by the dial-needles with the main thread, and none of the welt-stitches are in any manner interlocked with the loops or stitches *x x*, (or *w w*), formed by the cylinder-needles. In other words, the welt B is composed of stitches *z z*, which are knit entirely by the dial-needles. Consequently the welt B is composed of plain stitches and not of ribbed stitches, since, as is well known, when a single set of knitting-needles knits with a single thread or yarn a plain web is produced. In the meanwhile, while the welt-stitches are

being knit by the dial-needles, the cylinder-needles continue to knit with the main thread. While thus knitting alone with the main thread the cylinder-needles form the loops *w w*, which in the first row 6 6 above the ribbed work interlock with the stitches or loops *x x*. The loops *w w* are just like the loops *x x*, except that they are joined with each other in the same row or round instead of alternating with the dial-stitches *y y* or *z z*. Thus the cylinder-needles, while knitting independently of the dial-needles, knit a plain web, which is entirely distinct and separate from the welt knit by the dial-needles, except where both are joined to and merged into the ribbed web. When a welt or stripe of sufficient width has been knit, the separate knitting of the plain-stitch welt or stripe and of the plain-stitch backing is stopped, the welt or stripe and its backing are joined together, the separate welt-thread is broken off, and the knitting of a ribbed body portion A of the fabric is resumed with the main thread alone.

In case the fabric is made on a dial knitting-machine such as is set forth in said Letters Patent No. 461,508, these results are accomplished as follows: The knitting-cams which actuate the dial-needles so as to cause them to knit with the welt-thread and so form the welt-stitches *z z* are thrown out of action, and at the same time the welt-thread is broken off by a suitable thread-breaker. Simultaneously the other set of knitting-cams, which actuate the dial-needles and cause them to co-operate with the cylinder-needles, are thrown into action, so that both sets of needles knit with the main thread and form a ribbed fabric, the dial-needles again knitting the loops or stitches *y y*, alternating with the loops or stitches *x x*, formed by the cylinder-needles. When the shifting of the dial knitting-cams takes place, the dial-needles carry a row or round of the welt-loops *z z*, as shown at row 9 9 in Fig. 4, and the dial-stitches *y y* in the first row or round 10 10 of the upper section of the ribbed fabric are consequently interlocked with the stitches *z z*, so that the welt is joined without seaming or interruption with the ribbed web at its upper as well as at its lower edge.

The drawings show in Fig. 4 the web as it comes from the machine, the outside being the wrong side of the web and the welt consequently being inside. When the web is turned right side out the welt shows on the outside. If the main thread and welt-thread are of different colors—as a white main thread and a red welt-thread—a fabric will be formed in which the body portions will be a solid white color and of rib-stitches and it will have a horizontal welt or stripe of a solid red color and of plain stitches. The red welt entirely conceals the white backing fabric beneath, none of the white stitches showing through. The fabric is thus distinguished and characterized by having ribbed body portions of one solid color and plain-stitch trans-

verse welts or stripes of a contrasting solid color. The welts, it will be observed, are distinguished from the body both by the character of stitches and by the color of the thread. The welt is also thus formed without breaking the main thread or discontinuing knitting with it, so that the fabric where the welt is formed is as thick and close as the ribbed portions of the fabric. In fact, a little more thread is required to form the welt and its backing than would be required to form an equal width of ribbed web, as will be evident from an inspection of Fig. 4. The separation between the welt and its backing is clearly indicated in Figs. 2 and 3.

The improved fabric has been described as being made on a dial knitting-machine such as is set forth in Letters Patent No. 461,508. Since that patent describes a circular-knitting machine, the fabric made thereon would be tubular, with peripheral stripes or welts. The fabric need not, however, be tubular, and is not dependent for its construction upon any particular machine, since it can be knit by hand with ordinary knitting-needles. If knit by hand with ordinary knitting-needles, the body portion would be knit with one set of needles and with a single thread by purling, and the welt and its backing would be knit separately by two sets of needles.

In Fig. 1 a knit web is illustrated having a succession of ribbed body portions A and welts or stripes B. As shown in this figure, the upper part is the first part knit and the lower part is the last part knit. A broad welt B is at the top, then a narrow ribbed part A, then a narrow welt B', then a broad ribbed part A', and then a repetition of the same parts. Loose courses C C' of stitches may be formed in the web at desired intervals, as shown, to cut off by and to pick on by.

The sections of the fabric shown, each comprising the bands and welts B A B' A', are suitable for stocking-tops, shirt-cuffs, and drawers-bottoms. For this purpose a cutting-off slack course C is run in just preceding the broad welt B, so that the welt is at the terminal end.

I claim as my invention—

1. A knit fabric having a body portion, a welt or stripe, and a backing to said welt or stripe, the body portion being formed of rib-stitches and of a single main thread, the welt or stripe being formed of plain stitches and of a welt-thread separate from said main thread, and the backing being formed of plain stitches and of a single thread, which is the main thread and is continuous therewith, said welt or stripe being interknit only at its marginal edges with said body portion of the fabric and the thread of which the welt is composed not entering into or forming part of the body portion, substantially as set forth.

2. A knit fabric having a body portion, a welt or stripe, and a backing to said welt or stripe, said body portion and backing being composed of the same continuous thread and said welt or stripe being composed of a separate and independent thread and being located over said backing and interknit with said body portion and backing only at its margins, the thread of which said welt is composed terminating and being discontinued at the margins of the welt, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM HENRY PEPPER.

Witnesses:

LEROY M. GOULD,
JULIA A. BROWN.