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1,516,259

A. R. WOOD

SEWED BUTTONHOLE

Filed Feb. 27, 1923

Fig. 2

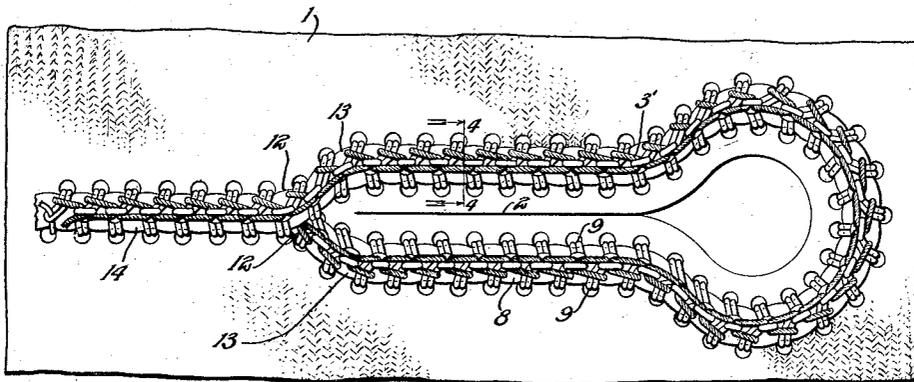
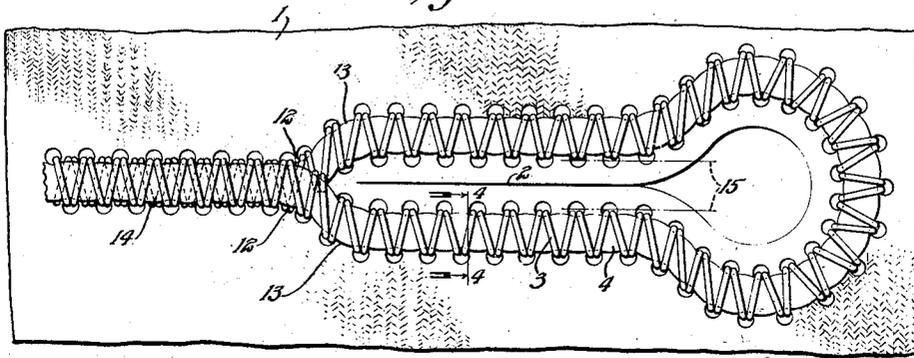


Fig. 1

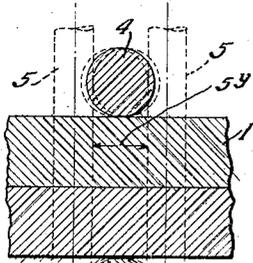


Fig. 3

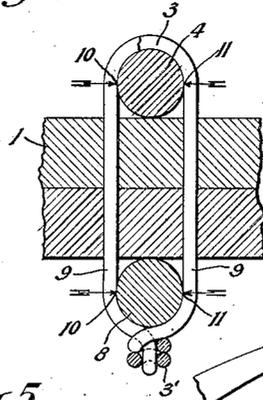


Fig. 4

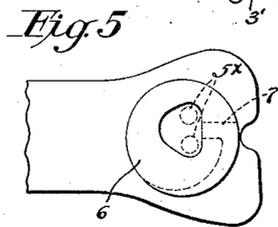


Fig. 5

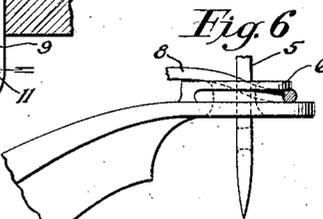


Fig. 6

WITNESSES

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SEWED BUTTONHOLE.

Application filed February 27, 1923. Serial No. 621,558.

To all whom it may concern:

Be it known that I, ALFRED R. WOOD, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Sewed Buttonholes, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to sewed buttonholes and has for an object to provide a piece of elastic fabric, such as knit goods, with a sewed buttonhole which will be slightly, durable and inexpensive and which will strongly resist deformation under longitudinal strains to which buttonholes are commonly subjected. Knit goods, being elastic, cannot be depended upon to resist a strain tending to deform a buttonhole sewed therein and the practice heretofore has been to provide the edge of the knitted garment to be buttonholed with reinforcement in the form of a facing or interlining strip of woven fabric through which the buttonholes are worked. The use of a facing or interlining strip is objectionable because of the additional cost of such strip and the cost of inserting it in the knitted tubular edge of the garment. It has also been proposed to provide reinforcement for buttonholes in knit goods by the expedient of sewing a plurality of times around the buttonholes, but this procedure is expensive and time consuming.

In accordance with the present improvement no additional reinforcement is required. The usual cord or cords at one or both sides of the fabric, instead of being led a plurality of times around the buttonhole, as proposed in the prior art, are led only once around the buttonhole; the ends of the cord or cords being superposed and overseamed in line with and beyond one end of the buttonhole slit to form a so-called "fly bar." The cord or cords is or are bound to position around the buttonhole slit by means of a narrow overseam laid in a zone of substantially the same width as the cord. The sewing comprises staggered thread-loop structures passing straight through the fab-

ric and suitably anchored therein, preferably by being enchained with loops of a looper-thread on the other side of the fabric. I prefer to employ a seam formed by a well-known buttonhole sewing machine such as that shown in the Allen Patent No. 1,372,472, of March 22, 1921, in which is incorporated the stitch-forming mechanism disclosed in the Allen et al. Patent No. 1,372,473, of March 22, 1921.

A buttonhole sewing machine of this type is commonly provided with a needle-throat or "button" having a cord-guiding passageway which leads the bottom cord within range of a laterally vibrating needle. The needle descends alternately on opposite sides of the cord and presents its loops to threaded and non-threaded loopers in alternation, which loopers anchor the needle-loops in the work by concatenating them with looper-thread loops, thereby forming a seam which binds the cord to the fabric around the buttonhole slit. Seams of this character, as heretofore sewed, are not suitable for buttonholes in knit goods without reinforcement, as the buttonholes will not resist longitudinal strains. Such strains easily stretch the sewed portions of the material and withdraw the end portions of the cord or cords from the embrace of the stitches, thus deforming the buttonhole and spoiling the appearance of the garment. I have discovered, however, that by materially reducing the amplitude of vibration of the needle of a fly-bar buttonhole sewing machine, so that the needle will alternately kiss the opposite sides of the cord (or cords when top and bottom cords are used), the resultant seam will grip the cord or cords so tightly that the buttonhole will resist heavy longitudinal strains and will be entirely satisfactory for knit goods work; making it unnecessary to use the objectionable facing strip or to sew a plurality of times around the buttonhole. A considerable saving of time and materials is thus effected and, moreover, knitted garments having buttonholes worked in accordance with the present improvement present a neater appearance than those having buttonholes faced

with a strip of woven fabric or stitched around a plurality of times.

It is preferable to so design the contour of the buttonhole seam that a wide cutting space is provided for the buttonhole slit, whereby the longitudinally extending portions of the seam will be spaced a safe distance from such slit. Also it is desirable to provide sharp reverse bends in the cord adjacent the fly barred end of the buttonhole slit. These bends augment the gripping action of the seam upon the cord or cords. When both top and bottom cords are used the machine is preferably provided in addition to the needle-throat or "button" with the usual top cord-guide or tube such, for example, as disclosed in the Allen Patent No. 1,039,241, of September 24, 1912.

In the accompanying drawings, Fig. 1 is a plan view of the purl or finished side of a sewed buttonhole embodying the invention. Fig. 2 is a plan view of the reverse side of the buttonhole (top side as stitched in a buttonhole sewing machine). Fig. 3 is a diagrammatic view illustrating the method of sewing the buttonhole of Figs. 1 and 2. Fig. 4 is a section through the buttonhole seam on the line 4—4, Figs. 1 and 2. Fig. 5 is a fragmentary plan view of the needle-throat of a buttonhole sewing machine adapted to practice the present invention, and Fig. 6 is a fragmentary side elevation of the needle-throat shown in Fig. 5.

In the accompanying drawings, 1 indicates an elastic body-fabric of knit goods having the wales running transversely of the length of the buttonhole-slit 2 and hence offering scarcely no resistance to deformation under strains longitudinally of such slit. The needle-thread 3 is shown as led back and forth across the stitching zone in zigzag arrangement on the top side of the work and preferably over a top cord 4 presented by the usual top cord-guide with which buttonhole sewing machines are commonly provided. The needle-thread may be so laid by a vibrating needle 5 of a buttonhole sewing machine, such as heretofore referred to, and the needle loops anchored in the work by enchaining them with loops of a looper-thread 3'. It is to be understood that other types of stitch-forming mechanism may be used within the scope of the invention. The needle-throat of the machine is shown at 6 and is formed with a passage-way 7 for the bottom cord 8. The passage-way 7 leads the bottom cord within the range of action of the stitch-forming mechanism which in the present disclosure includes a vibrating needle whose alternate paths are indicated at 5^x, Fig. 5. The distance or clearance space 5^y between the paths of the vibrating needle is so adjusted as to be substantially equal to or slightly less than the

thickness or width of the cord or cords, whereby the needle will alternately kiss the opposite sides of the cord, preferably slightly deflecting the cord alternately in opposite directions, as shown in dotted circles, Fig. 3, and projecting the needle-loops 9 substantially vertically through the work from their points of contact 10, 11, Fig. 4, with the cords 4 and 8. The width of the overseamed zone in the body fabric is defined by the distance between the keyed thread-loop structures 9, 9, as viewed in Fig. 4, and will be seen to be substantially equal to the width of the cord. The cords are thus engaged progressively around the buttonhole at substantially diametrically opposed points 10, 11, by the limbs of the keyed and staggered thread-loop structures 9. In other words the cords are embraced or gripped by the overseam over a surface substantially 180° in circumferential extent, and one end of the cord in line with but beyond the end of the slit has the other end of the cord superposed upon and tightly bound to it by the narrow overseam above described.

The security of the seam against longitudinal distortion may be enhanced by laying the cord or cords and stitches in sharp reverse bends 12, 13, adjacent one end of the buttonhole slit. If, as often happens, the needle penetrates or sews through the cords at the sharp bends, still further security is given to the seam. The buttonhole is preferably sewed before the slit 2 is cut and the contour of the stitching zone is preferably so designed as to afford a relatively wide cutting space 15 whereby the seam will be formed at a safe distance from the cut edges of the buttonhole slit. In practice, the stitches are drawn tightly around the cords which latter may become embedded more or less in the fabric. By superposing and tightly binding the finishing end of the cord upon the tightly bound beginning end along the fly-barred portion of the buttonhole, the ends of the cord are so well secured together that the buttonhole is unexpectedly strongly resistant to longitudinal strains.

Having thus set forth the nature of the invention, what I claim herein is:—

1. A sewed buttonhole comprising a body-fabric of unreinforced knit-goods having a buttonhole-slit, a cord passing once only around said slit, and an overseam covering said cord and comprising a row of staggered and keyed thread-loop structures passing in straight lines through the body-fabric and defining an overseamed zone in the body-fabric of substantially the same width as the cord, the end portions of the cord being superposed and overseamed beyond and in line with the buttonhole-slit to form a fly-bar.

2. A sewed buttonhole comprising a body-

fabric of unreinforced knit-goods having a buttonhole-slit, a cord passing once only around said slit, and an overseam covering said cord and comprising a row of staggered
5 and keyed thread-loop structures passing straight through the body-fabric and defining an overseamed zone in the body-fabric of substantially the same width as the cord, and the cord being subjected to sharp reverse bends adjacent the fly-barred end of
10 the buttonhole.

In testimony whereof, I have signed my name to this specification.

ALFRED R. WOOD.