

Aug. 13, 1935.

H. McK. CARMICHAEL ET AL

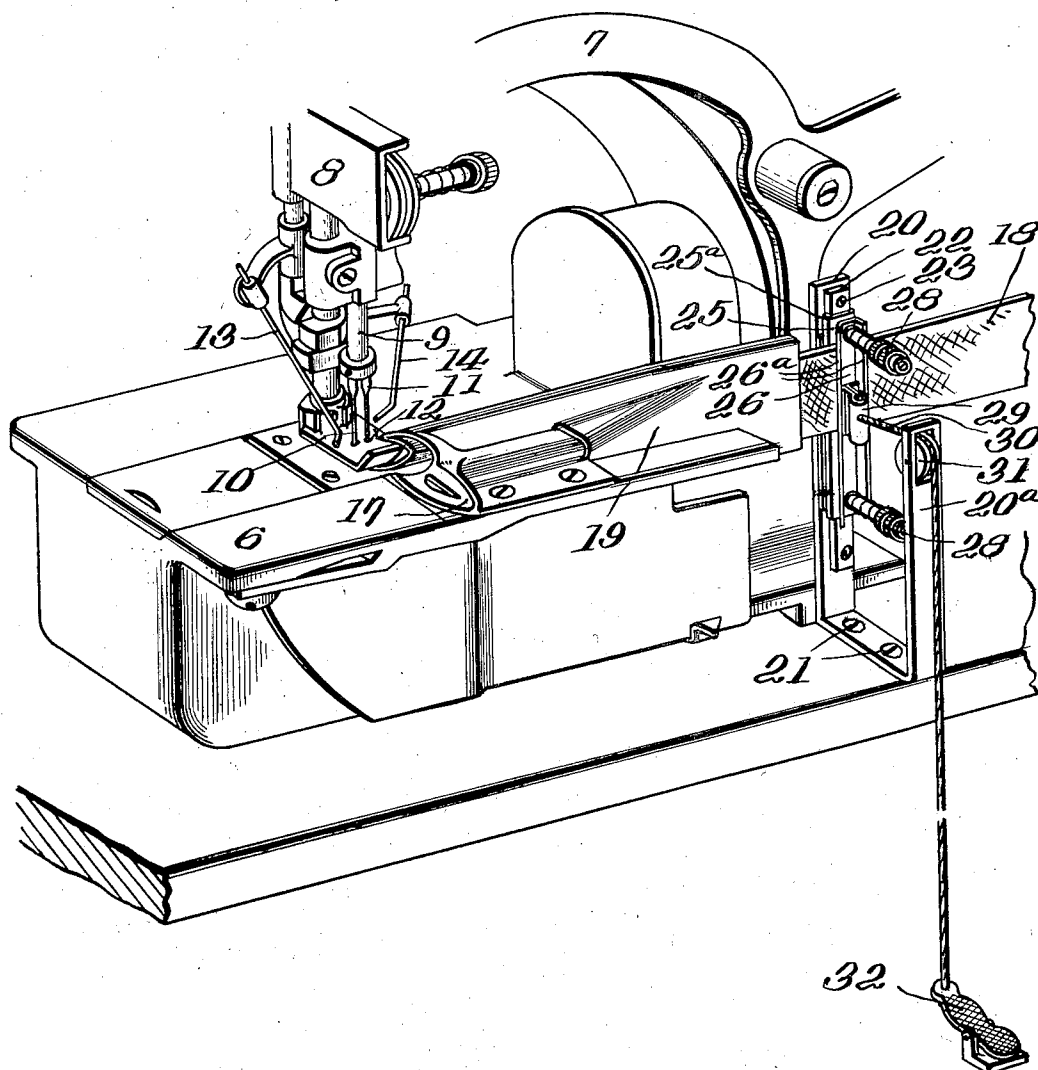
2,011,513

APPARATUS FOR BINDING THE EDGES OF KNITTED FABRICS

Original Filed Oct. 7, 1932

2 Sheets-Sheet 1

Fig. 1.



Inventors  
H. McK. Carmichael  
C. C. Johnson  
S. J. Hankins

By

Sturtevant + Mason

Attorneys

Aug. 13, 1935.

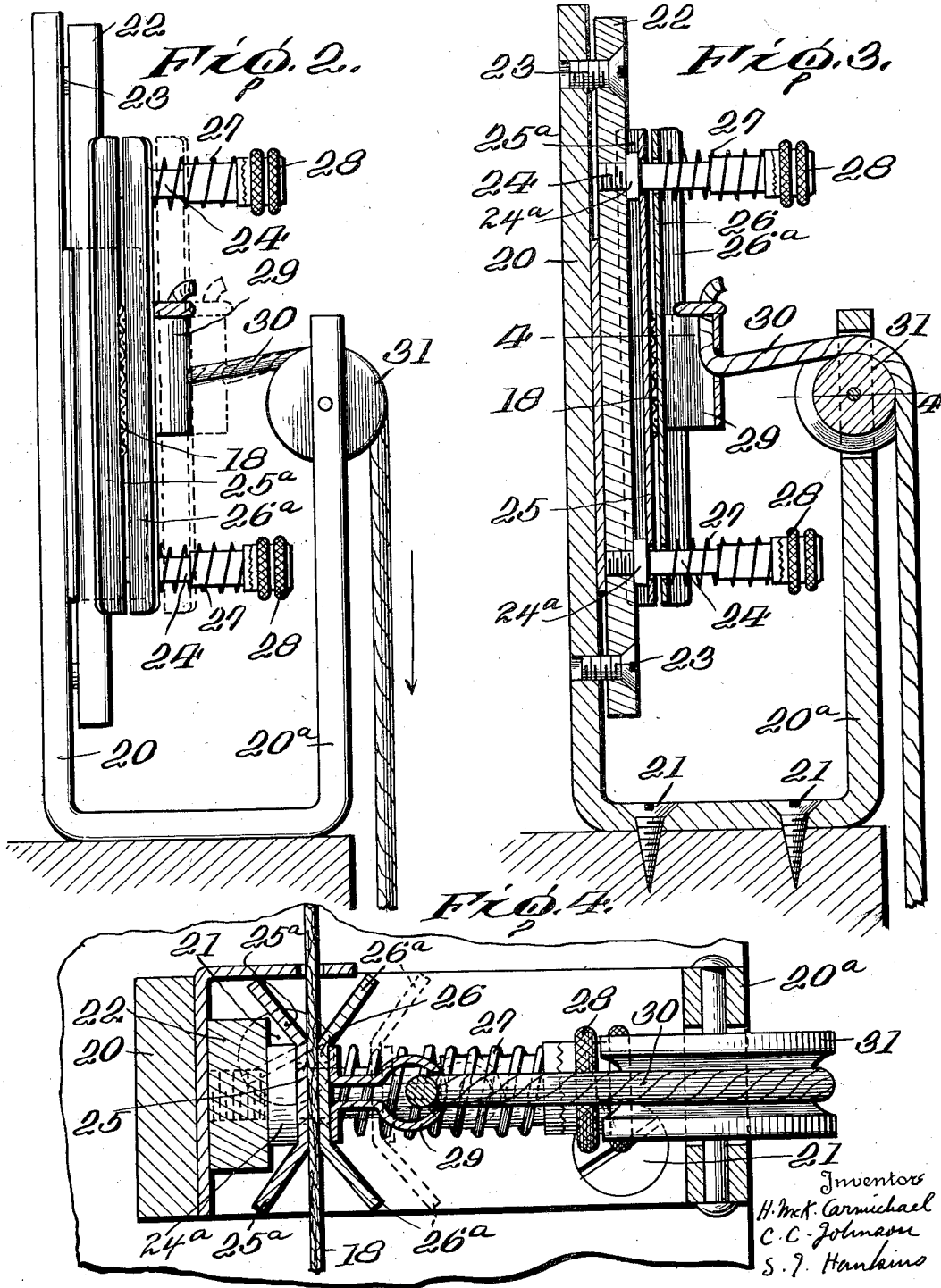
H. M<sup>c</sup>K. CARMICHAEL ET AL

2,011,513

APPARATUS FOR BINDING THE EDGES OF KNITTED FABRICS

Original Filed Oct. 7, 1932

2 Sheets-Sheet 2



By

Sturtevant & Mason

Attorneys

## UNITED STATES PATENT OFFICE

2,011,513

APPARATUS FOR BINDING THE EDGES OF  
KNITTED FABRICS

Herbert McK. Carmichael, Charlie C. Johnson,  
and Sidney I. Hankins, Knoxville, Tenn., as-  
signors, by mesne assignments, to Union Special  
Machine Company, Chicago, Ill., a corporation  
of Illinois

Original application October 7, 1932, Serial No.  
636,764. Divided and this application July 25,  
1934, Serial No. 736,938

7 Claims. (Cl. 112—152)

The invention relates to new and useful im-  
provements in an apparatus for applying a bind-  
ing strip to the curved cut edge of a knitted fab-  
ric and more particularly to an improved device  
for applying and releasing the tension on a bind-  
ing strip at the will of the operator.

In making knitted undergarments, it is a com-  
mon expedient to form a tubular knitted blank  
and to cut out and shape the blank to form the  
neck portion and armholes of the garment. The  
wales of the fabric extend lengthwise of the blank  
and of the finished garment. The cut edge form-  
ing the neck portion extends in part lengthwise  
of the wales and in part crosswise of the wales  
and is curved therebetween. The same is true of  
the armholes. The present invention has to do  
with an apparatus for the applying of a binding  
to a cut edge of a knitted fabric which extends in  
part lengthwise of the wale and in part crosswise  
of the wale in accordance with the method set  
forth in the copending application of Carmichael,  
et al., Serial No. 636,764, filed October 7, 1932, of  
which this is a division.

An object of the invention is to provide an  
improved apparatus for binding the edges of  
knitted fabrics wherein the binding strip may be  
placed under tension or released from tension  
during the stitching of the same to the fabric at  
the will of the operator.

The above and other objects of the invention  
will in part be obvious and will be hereinafter  
more fully pointed out.

In the drawings:

Figure 1 is a perspective view showing a sewing  
machine to which the tension device has been  
applied for applying tension to the binding strip  
as it is being stitched to the body fabric.

Fig. 2 is a side view of the tension device shown  
applied to a sewing machine in Fig. 1.

Fig. 3 is a side view of the tension device in  
section.

Fig. 4 is a sectional view taken along line 4—4  
of Fig. 3 with the pulley shown in full lines.

The binding strip is formed from a knitted  
fabric, the wales of which extend lengthwise of  
the binding strip. The binding strip is secured  
to the body fabric by a stitching mechanism  
which, as shown in the drawings, forms a cover-  
ing stitch for both edges of the binding strip.  
While other forms of stitching may be used, this  
covering stitching is preferable as it not only  
firmly joints the binding to the body fabric, but  
also gives an ornamental effect to the garment.  
The stitch is produced by a two-needle sewing  
machine having a cover thread-laying mecha-

nism for laying a thread which joins the two lines  
of stitching on one face of the fabric, and the  
needle thread loops are joined by a looper thread  
which covers the other edge of the binding strip.  
This is a common form of cover stitch forming  
mechanism.

The binding strip is passed through a binder  
preferably of the type wherein the fabric edges  
are folded and then the strip is inverted so as to  
bring the folded edges between the strip and the  
body fabric. This binder is of such a character  
that the binding strip will be guided therethrough  
with little resulting or stretching tension on the  
strip. At the receiving end of the binder there is  
a tension device including tension plates between  
which the binding strip passes. There are pro-  
vided spring means for yieldingly holding the  
plates against the strip and manually controlled  
means for separating the plates so as to free the  
strip from tension.

The binding strip, when being stitched to the  
body fabric by a feed of the strip, and the fabric  
in a direction lengthwise of the wales, is substan-  
tially free from all tension. When, however, the  
binding strip is being stitched to the body fabric  
at a portion thereof crossing the wales, a tension  
or drag is placed on the strip, so that the feed of  
the machine will stretch the strip to a certain  
extent. The knitted binding strip with the wales  
extending lengthwise thereof has a certain  
amount of elasticity so that the application of  
tension thereto will stretch it. The feed of the  
fabric, when extending lengthwise of the wales,  
will lay the fabric smoothly without stretching  
the same, but when, however, the feed extends  
crosswise of the wales, or approximately in a  
crosswise direction, the handling of the fabric,  
together with the feed, necessarily stretches the  
fabric, thus distorting or separating the normal  
lay of the wales at the cut edge. Inasmuch as  
the binding strip is also stretched at this time  
when it passes from beneath the presser foot  
after it is stitched to the body fabric, it will re-  
turn to its normal unstretched condition and this  
will likewise restore the cut edge of the fabric  
sections to their normal condition with the wales  
parallel all the way to the cut edge. In other  
words, the binding strip and the edge of the fabric  
are both stretched to substantially the same de-  
gree during stitching.

In Figure 1 of the accompanying drawings,  
there is shown a sewing machine which includes  
a work support 6, an overhanging arm 7 carry-  
ing a needle head 8 within which the needle bar 9  
reciprocates. The needle bar 9 carries two

needles 10, 11. The material is held on the work support by a presser foot 12 and is fed across the work support by a feeding mechanism including a feed dog cooperating with the presser foot. Co-  
 5 operating with the needles above the work support is a thread laying mechanism which includes a thread guide 13 and a cooperating thread hook 14. This mechanism lays the thread in loop form so that it is secured by the needle threads and  
 10 thus forms a covering for the upper edge of the binding strip. Cooperating with the needles beneath the work support is a looper, the thread of which joins the needle thread loops and thus forms a covering for the lower edge of the binding strip. The cut edge of the fabric to which the  
 15 binding strip is to be applied is guided beneath the presser foot 12 by a guiding member 17. The binding strip 18 passes through a binder 19 which is of the usual type.

20 The binder is provided with means for folding the edges of the binding strip and inverting the strip as it passes from the binder beneath the presser foot so that the inturned edges of the strip lie between the body portion of the strip  
 25 and the body fabric. Before the binding strip 18 passes into the binder 19, it passes through a tension device.

This tension device, as illustrated in the accompanying drawings, is in the form of a bracket 20  
 30 which is secured in position by suitable screws 21. A plate 22 is mounted on the bracket 20 and secured thereto by screws 23. Two tension posts 24, 24 are supported on the plate 22 and spaced from one another. A tension plate 25 having inclined wing portions 25<sup>a</sup> is mounted on the posts  
 35 24 with portions thereof contacting with shoulder 24<sup>a</sup> on the posts 24. A tension plate 26 having similar inclined wing portions 26<sup>a</sup> is mounted on the posts 24, 24. The binding strip 18 is adapted  
 40 to pass between the tension plates 25 and 26 in the region between the posts 24. There is a spring 27 on each post and an adjustable nut 28 which serves as an abutment for the spring and which may be shifted to vary the tension of the  
 45 spring. These springs 27 bear continuously against the tension plate 26 and tend to normally force the plate 26 toward the plate 25 so as to grip the binding strip between the plates. In order to release the tension on the strip, the plate  
 50 26 is forcibly moved away from the plate 25 by a tension releasing mechanism. Attached to the plate 26 is a bracket 29 to which a flexible cord 30 is connected. This cord 30 runs over a roller  
 55 20, which is carried by the arm 20<sup>a</sup> of the bracket 20, and is then connected to a treadle 32. When the treadle 32 is depressed, the plate 26 may be moved away from the strip so as to relieve it from all tension. When the treadle 32 is released then  
 60 the springs 27 operate to force the plate 26 toward the plate 25 in order to grip the binding strip and thus apply tension thereto. The operator, through the treadle, may vary the tension on the strip all the way from full tension to complete release.

65 It is to be clearly understood that the tension device shown and described herein may be employed wherever it is desirable to place a strip under tension and that minor changes in details of construction and arrangement of parts may  
 70 be made without departing from the scope of the invention as set forth in the appended claims.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent, is:

75 1. An apparatus for stitching knitted fabrics

comprising a stitching mechanism, a binding guide for directing a binding strip about the edges of a fabric and to the stitching mechanism, a tension device located adjacent the receiving  
 5 end of said binding guide and including tension plates between which the strip passes, means for mounting said tension plates for parallel movement relative to one another, spring means for  
 10 yieldingly moving said plates relative to each other for placing a tension on said strip, and manually controlled means for separating the tension plates to vary the tension applied to the strip.

2. An apparatus for stitching knitted fabrics comprising a stitching mechanism, a binding  
 15 guide for directing a binding strip about the edges of a fabric and to the stitching mechanism, a tension device located adjacent the receiving end of said binding guide and including a stationary tension plate and a movable tension  
 20 plate mounted for parallel movement relative to one another, spring means for normally forcing said movable tension plate toward said stationary tension plate to apply tension to the strip passing therebetween, and treadle controlled  
 25 means for moving said movable tension plate away from said stationary tension plate to release the tension on the strip.

3. In a sewing machine, the combination of a  
 30 stitch forming mechanism, means for directing a strip thereto, and a tension device through which said strip is adapted to pass, said tension device comprising a supporting bracket, a pair of tension  
 35 plates mounted on said bracket for parallel movement relative to one another, spring means for normally holding said plates together to apply tension to the strip, and treadle controlled means for separating said plates to release the tension on the strip.

4. In a sewing machine, the combination of a  
 40 stitch forming mechanism, means for directing a strip thereto, and a tension device through which said strip is adapted to pass, said tension device comprising a supporting bracket, a pair of spaced posts carried thereby, a pair of relatively  
 45 movable tension plates carried by said posts, a spring on each post for normally holding said tension plates together to apply tension to the strip, and treadle controlled means for separating said plates to release the tension on the  
 50 strip.

5. In a sewing machine, the combination of a  
 55 stitch forming mechanism, means for directing a strip thereto, and a tension device through which said strip is adapted to pass, said tension device comprising a supporting bracket, a pair of spaced posts carried by said bracket, a pair of tension plates supported by said posts, a spring  
 60 on each post for normally holding said tension plates together to apply tension to the strip, a roller carried by said bracket, and a flexible cord passing over said roller and having one end connected to one of said tension plates and having the opposite end connected to a treadle whereby the tension plates may be separated to release  
 65 the tension on the strip by depressing the treadle.

6. In a sewing machine, the combination of a  
 70 stitch forming mechanism, means for directing a strip thereto, and a tension device through which said strip is adapted to pass, said tension device comprising a supporting bracket, a pair of relatively movable tension plates carried thereby, spring means for normally holding said  
 75 tension plates together to apply tension to the

strip, a fastening device carried by one of said tension plates, and treadle controlled means including a flexible cord secured to said fastening device for separating said tension plates to release the tension on the strip.

7. In a sewing machine, the combination of a stitch forming mechanism, means for directing a strip thereto, and a tension device through which said strip is adapted to pass, said tension device comprising a supporting bracket having a pair of upstanding arms, a pair of relatively

movable tension plates carried by one of said arms, spring means for normally holding said tension plates together to apply tension to the strip, a pulley mounted on the other of said arms and means including a flexible cord passing over said pulley and secured to one of said tension plates for separating the same whereby to release the tension on the strip.

HERBERT McK. CARMICHAEL.

CHARLIE C. JOHNSON.

SIDNEY I. HANKINS.

10