

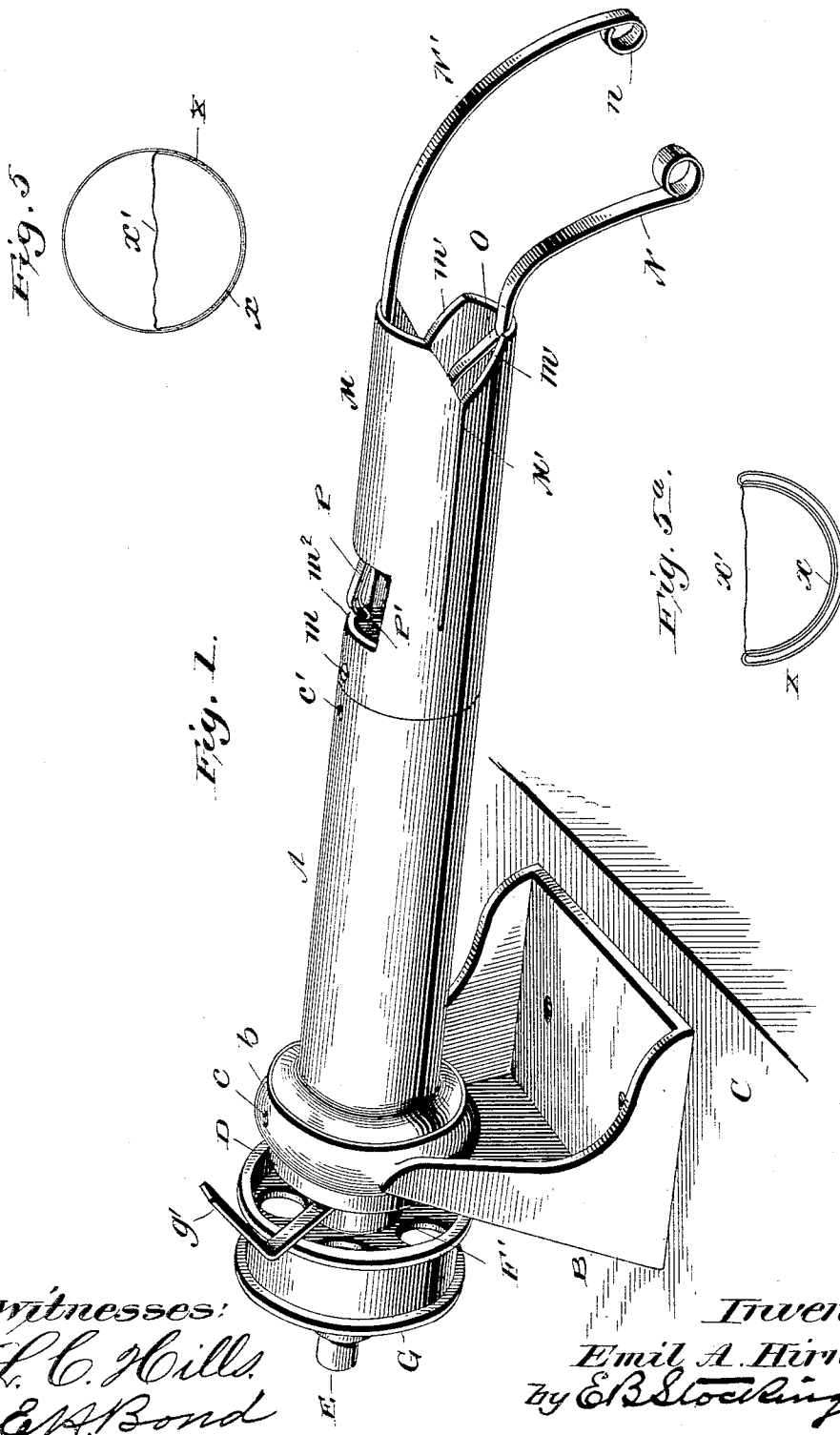
(No Model.)

2 Sheets—Sheet 1.

E. A. HIRNER.
STOCKING CUTTER.

No. 594,400.

Patented Nov. 30, 1897.



Witnesses:
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E. A. Bond

Inventor:
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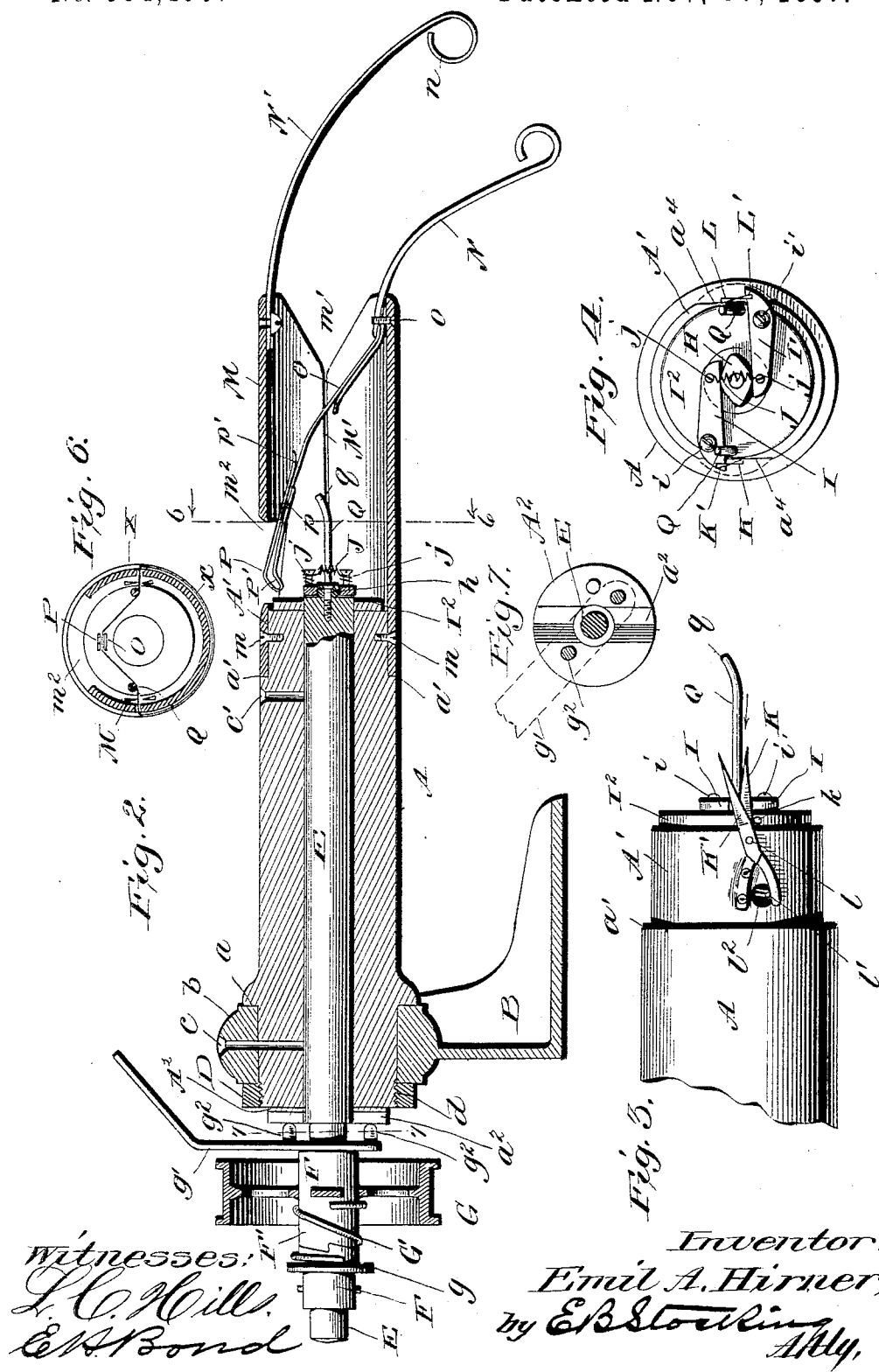
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UNITED STATES PATENT OFFICE.

EMIL A. HIRNER, OF ALLENTOWN, PENNSYLVANIA.

STOCKING-CUTTER.

SPECIFICATION forming part of Letters Patent No. 594,400, dated November 30, 1897.

Application filed January 25, 1897. Serial No. 620,627. (No model.)

To all whom it may concern:

Be it known that I, EMIL A. HIRNER, a citizen of the United States, residing at Allentown, in the county of Lehigh, State of Pennsylvania, have invented certain new and useful Improvements in Stocking-Cutters, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful devices designed, primarily, for use in severing the yarn of a double-soled stocking. It may be termed a "stretcher and cutter." It embodies a tubular portion over which the
15 stocking is stretched, the outer end of said tubular portion having fingers, one of which is of spring material and serving to keep the stocking under proper tension while being operated upon by the cutting devices. Within
20 this tubular portion is a guide for receiving and holding the interior transverse strands of the yarn and hold them under tension while they are being operated upon at their junction with the stocking by the cutters.

25 Simple means are provided for actuating the cutters, which are in the shape of shears, and the device as a whole constitutes a simple, cheap, and compact mechanism for accomplishing the desired end.

30 A further object of the invention is to assemble the parts so as to provide for ready access to the operating parts in case of necessity for repairs thereof and permitting of ready removal of the cutters as they become
35 dull and require sharpening.

Other objects and advantages of the invention will hereinafter appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

40 The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form part of this specification, and in which—

45 Figure 1 is a perspective view of my improved device in operative position. Fig. 2 is a substantially central vertical longitudinal section through the same with a portion broken away. Fig. 3 is a side elevation with the outer tubular portion removed. Fig. 4
50 is an end view of Fig. 3. Figs. 5 and 5^a are

details of the material to be cut; and Fig. 6 is a vertical cross-section on the line 6 6 of Fig. 2, looking in the direction of the arrow, with the stocking in position upon the tubular portion, the transverse strands being shown as in their stretched condition. Fig. 7 is a vertical section on the line 7 7 of Fig. 1.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the cylindrical body portion of the device, mounted upon a suitable base or support B, which is designed to be secured in position upon a bench, table, or other support C in any suitable manner. In this instance the bracket or casting B is shown as having a ring-like portion *b*, which embraces the end of the part A, being held against a shoulder *a* thereof by means
60 of the nut D, engaging exterior thread *d* upon the extreme end of the part A, as indicated best in Fig. 2.

c is a small opening extending through the upper part of this ring portion and coincidently through the part A to provide means for lubricating the rotary spindle which is mounted to revolve freely within the bore of the part A.

c' is a small oil-feed at the other end of the part A, all as clearly indicated in Fig. 2.

The outer end of the part A is provided with a reduced portion, as seen at A', forming a shoulder *a'*, over which reduced portion and against said shoulder the removable tubular portion soon to be described fits, as clearly indicated in Fig. 2.

E is the shaft or spindle mounted to revolve within the body portion A. It is adapted to be operated in any suitable manner. In this instance it is shown as extended at one end and has fast thereupon the fixed portion F of a clutch, while F' represents the movable portion of said clutch, carrying the belt-pulley G, adapted to be connected by belt with any suitable source of power. (Not shown.)

G' is a spring around the hubs of the two portions of the clutch and bearing at one end against a shoulder, collar, or flange *g* upon the fixed part of the clutch, as clearly indicated in Fig. 2. This movable portion of the clutch may be actuated so as to be moved

lengthwise of its shaft in any suitable manner, in this instance a lever g' being shown, which bears against the inner end of the hub of said movable portion and is loosely sleeved upon the shaft E, one end being turned, as indicated, so as to form an operating means, and the body portion of said lever or arm carrying the diametrically oppositely disposed pins or projections g^2 , which are adapted to engage the end of the body portion A or a plate A^2 upon the end of said body portion, and when engaged in the depressions a^2 of said plate the spring will force the movable portion of the clutch toward the body portion A and thus disconnect the clutch, so that motion will not be imparted to the shaft; but when the lever is moved so as to force the movable portion of the clutch toward the fixed part the pins will ride upon the inclined walls of the depressions in a well-known manner and engage upon the outer face of the plate, as indicated in Fig. 2, and thus hold the two parts of the clutch in operative contact, so that when motion is imparted to the pulley G the shaft E will be revolved. This is, however, but one of the well-known forms of clutch mechanism that may be employed in connection with my device.

On the outer end of the shaft or spindle E is the cam H, mounted to move with said shaft or spindle in its revolutions and secured to the same in any suitable manner—as, for instance, by the screw h —permitting of its ready removal or adjustment when necessary or desired.

I I' are levers pivotally mounted, as at i i' , respectively, upon the outer end of the body portion A, or preferably, as indicated in Figs. 2, 3, and 4, upon a plate I^2 upon the end of said body portion and through which the outer end of the shaft or spindle E projects, as seen best in Fig. 2. These levers have their inner ends arranged one above and the other below the cam H, as seen most clearly in Fig. 4, and adapted to be simultaneously moved away from each other by the movement of said cam, as will be readily understood, and adapted to be held normally toward each other and brought back to such normal position, after being acted upon by the cam, by means of a spring J, the ends of which are secured to the ends of the levers in any suitable manner, as by being coiled upon or secured to the screws or other projections j , extending from the ends of the levers, as seen in Figs. 2 and 4. The outer ends of these levers are designed to contact with and operate the movable portions of the cutters. In this instance they are shown as in the form of scissors or shears.

K is the fixed blade upon one side, and L the fixed blade upon the other side, of the head or body portion, it being understood that the fixed portions of the cutters or shears are alternately arranged upon opposite sides—that is, upon one side the fixed portion is the

uppermost, while upon the other side it is the lowermost.

K' and L' are the movable blades or portions of the cutters. They are, likewise, alternately arranged, the one upon one side being uppermost, while that upon the other side is the lowermost. The movable portions or blades of the cutters are engaged and moved by the outer ends of the levers I I', as seen best in Fig. 4. As the shaft or spindle E is revolved, the cam moving therewith separates the inner ends of the levers, moving their outer ends simultaneously in opposite directions and by engagement with the movable portions of the scissors or cutters, operates them simultaneously upon opposite sides of the head, so as to sever the yarn.

Suitable stops k may be provided upon the head or the plate I^2 , as indicated in Fig. 3, to aid the fixed portion of the cutter in resisting strain and pressure thereon.

The fixed portion of the scissors may be secured in any suitable manner to opposite sides of the reduced portion A' of the head or body portion, which is flattened, as seen at a' in Figs. 3 and 4, for this purpose, the movable portions or blades of the cutters being pivotally mounted, as at l , and a spring l' is provided, acting upon the movable blade to the rear of its pivot to normally force the same open when not acted upon by the levers. This spring, as seen in Fig. 3, is located in a recess l^2 in the flattened portion of the reduced portion A' of the head.

M is a tubular extension, of any required length, adapted to be detachably secured upon the outer end of the head or body portion, it being sleeved upon the reduced portion A' thereof, with its inner end abutting against the shoulder a' , as seen in Fig. 2, where it is held by screws or analogous means m , permitting of its ready removal when necessary. This tubular extension is provided upon opposite sides with the longitudinal slits M', extending for the greater portion of its length, as seen best in Fig. 1, and the entrance to these slits at the outer end is beveled, as seen at m' —that is, the side walls thereof diverge from the outer end of the slit outward, so as to guide the transverse strands of the yarn of the article to be cut into said slits. Secured to the outer end of this tubular extension, upon the inner wall of the lower face thereof, is the curved arm N, the free end of which is so constructed as not to present a square shoulder to impede the application of the stocking or other article to the extension, while to the under side of the upper face of the extension is secured a spring-arm N', the free end of which is formed into a coil n or otherwise formed so as to avoid the presentation of a sharp edge or shoulder, so as not to impede the entrance of the arms into the stocking. The upper side of this extension M is provided with an opening m^2 adjacent to the outer end of the head, as seen

in Figs. 1, 2, and 6, while O is a spring-arm secured centrally to the inner under face of the tubular extension at the front end, as seen at *o*, in this instance being secured by the same means that retains the arm N in position. This spring-arm O extends upward and rearward in an inclined direction, and its rear upper end terminates opposite the opening m^2 in the upper face of the extension, as seen in Figs. 1 and 2. Near said upper end it has secured thereto, as upon a pin or rivet *p*, the arm P, which is folded upon itself to form the loop P' at its upper end, which is bent slightly downward and to the rear, as indicated in Figs. 1 and 2, and its free end extended back along the upper face of the arm O and at its end bent slightly upward, as at *p'*, so as to form a V-shaped or tapered entrance, as indicated best in Fig. 2, into which entrance the transverse strands of the yarn are to be entered and to be received between the upper face of the arm O and the under face of this spring-arm P, as indicated in Fig. 6.

Secured to the front end of the head or body portion A or to the plate I² thereon are the rods Q, which extend forward substantially in line with the slits M' of the tubular extension M, as indicated, and their outer or free ends are turned slightly upward, as at *q*, so that as the stocking or other article is placed in position the transverse strands of the yarn will be engaged near their junction with the stocking beneath these rods or arms, as clearly seen in Fig. 6, so as to put the same under tension, whereby they are more readily cut by the cutters or scissors.

With the parts constructed and arranged substantially as above set forth the operation will be readily understood, and, briefly stated, is as follows: Upon reference to Figs. 5 and 6 the letter X designates the stocking or other article to be operated upon. It will be seen that it is provided with a double sole, as at *x*, and the transverse strands *x'*, connecting the opposite sides of the double portion, are those to be operated upon to be severed by the cutters hereinbefore described. The stocking is introduced over the arms N N', the spring of the latter serving to keep the stocking under tension, and as the stocking is drawn over the same and over the tubular extension M toward the inner end thereof the transverse strands are engaged in the slits M' M' of this tubular extension, into which they are guided by the inclined entrances thereof, and as the stocking is further drawn onto the extension the said transverse strands are received into the spring-clamp formed by the arms O and P at the center and beneath the tension-rods Q Q at the sides, as indicated in Fig. 6, so as to be held under proper tension. Rotary motion is imparted to the spindle or shaft E, and this having been done the stocking is pulled onto the head over the extension, and the rotary motion of the shaft or

spindle E actuates the cutters or scissors through the medium of the cam and lever above described, and the transverse strands are severed at their junction with the body portion of the stocking, the severed strands being held between the arms O and P, and as the stocking is advanced the severed strands are forced into the loop P' of the arm P, from which they can be readily removed transversely of the length of the extension through the opening m^2 in the upper face thereof. The shafts being revolved at a rapid rate, the strands are quickly cut, and when one stocking has been thus treated it is removed and another placed in its proper position and the operation repeated.

Instead of passing the tubular fabric over the extension or form, as hereinbefore described, so that the strand to be severed is within the tube, the tube may be reversed or turned inside out, so that the interior transverse strand will be exposed, as shown in Fig. 5^a. The operation of cutting this strand is the same as that hereinbefore described, with the exception that the tubular fabric is passed only under the lower face of the extension or form. The strand *x'*, however, engages the tension devices and cutters in the same manner as when the tubular fabric is passed over both faces of the form or extension.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages. For example, the transverse strands X' may be stretched from one folded edge to another of the tubular fabric while the tube is turned inside out, with the single-ply half folded against the double-ply half of said tube. This form of folding is illustrated clearly in Fig. 5^a. It will be seen at a glance that the tube thus doubled could be passed along the under or upper side of a head or any strand-separating devices of suitable form, while the strands to be severed would be carried in the slots M', or an equivalent strand-separating device, and then guided to any suitable strand-severing mechanism.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A device comprising a form for stretching a tubular, knitted fabric and interior cutters carried by the form for severing interior transverse strands thereof, substantially as specified.

2. A device comprising a form for holding a tubular fabric having interior transverse strands, a guide for placing the transverse strands under tension and separating said strands from the body of the fabric whereby the strands are adapted to be operated upon, and a cutting mechanism for severing said strands, substantially as specified.

3. The combination with a head, of means for stretching a tubular body, and means car-

ried by the head and projected into said stretching means for severing transverse, interior strands of such body, substantially as described.

5 4. The combination with a head, of means for stretching a tubular body, means carried by the head for severing transverse strands of such body, and yielding means for placing said strands under tension, substantially as described.

10 5. The combination with a head, of means for stretching a tubular body, means carried by the head for severing transverse strands of such body, and means near the center of the tube or head for placing said strands under tension, substantially as described.

15 6. The combination with a head, of means for stretching a tubular body, means carried by the head for severing transverse strands of such body, and means near the sides of the tube or head for placing said strands under tension; substantially as described.

20 7. The combination with a head, of means for stretching a tubular body, means carried by the head for severing transverse strands of such body, and means near the center of the tube or head and near the sides thereof for placing said strands under tension; substantially as described.

25 8. The combination with a head, of a slitted extension or form for stretching a tubular body, means carried by the head for severing transverse strands of such body, means near the center of the tube or head and near the sides thereof for placing said strands under tension, substantially as described.

30 9. The combination with a head and its extension or form having oppositely-disposed, longitudinal slits, means for placing under tension the transverse interior strands of the tubular, knitted body, and means for severing said strands while under tension, substantially as described.

35 10. The combination with a head and its extension or form having oppositely-disposed, longitudinal slits, of means for placing under tension the transverse strands of a tubular, knitted body, means for severing said strands while under tension, and guiding-arms for said tubular body at the outer end of said extension, substantially as described.

40 11. The combination with a head and its extension or form having oppositely-disposed, longitudinal slits, of yielding means for placing under tension the transverse strands of a tubular knitted body, means for severing said strands while under tension, and rods for engaging the strands in proximity to the points where the cutters operate thereupon, substantially as described.

45 12. The combination with a head and a revoluble shaft, of an extension or form on said head having longitudinal slits, interiorly-arranged cutters carried by the form, and the cam carried by said shaft and constructed

and arranged to simultaneously actuate said cutters, substantially as described.

13. The combination with a head and a revoluble shaft, of an extension or form on said head having longitudinal slits, interiorly-arranged cutters carried by the form, a cam carried by said shaft and constructed and arranged to simultaneously actuate said cutters, and means for receiving and holding under tension the transverse strands of the article operated upon, substantially as described.

14. The combination with a body portion and its tubular extension having longitudinal slits, of arms at its outer end, a spring-arm for holding under tension the strands to be severed, and cutters for severing said strands; substantially as described.

15. The combination with a body portion and its tubular extension having longitudinal slits, of arms at its outer end, a spring-arm for holding under tension the strands to be severed, cutters for severing said strands, and rods for holding the strands under tension in proximity to the cutters; substantially as described.

16. The combination with a body portion and its tubular extension having oppositely-disposed, longitudinal slits and an opening upon its upper face in proximity to the end of the body portion, of the oppositely-disposed cutters, means for actuating the same, and a spring-arm carried by the extension and having a loop adjacent to the opening in said extension; substantially as described.

17. The combination with a body portion and its tubular extension having oppositely-disposed, longitudinal slits and an opening upon its upper face in proximity to the end of the body portion, of oppositely-disposed cutters, means for actuating the same, a spring-arm carried by the extension and having a loop adjacent to the opening in said extension, and arms on the outer end of the extension, one of which is resilient; substantially as described.

18. The combination with a body portion and its tubular extension having oppositely-disposed, longitudinal slits and an opening upon its upper face in proximity to the end of the body portion, of oppositely-disposed cutters, means for actuating the same, a spring-arm carried by the extension and having a loop adjacent to the opening in said extension, and rods carried by the outer end of the body portion adjacent to the slits of the extension; substantially as described.

19. Mechanism for severing inner transverse strands of tubular knitted fabric, consisting of a tubular fabric-holding device, means for separating the inner transverse strands from the body of the fabric, and means for severing the said separated strands, substantially as and for the purpose set forth.

20. Mechanism for severing transverse

strands of a knitted tubular fabric, consisting of means for insertion between the fabric and the strands for separating the said strands from the body of the fabric, and
5 means for severing the strands at both ends when thus separated, substantially as described.

21. In mechanism for the purpose described, the combination of a form for holding
10 a tubular knitted fabric, strand-separat-

ing means, and severing devices acting at both ends of the strand, substantially as specified.

In testimony whereof I affix my signature in presence of witnesses.

EMIL A. HIRNER.

Witnesses:

EDWARD RUHE,
REUBEN J. BUTZ,
S. A. BUTZ.