

J. P. WEIS & L. KRUG.
COLLARET MACHINE.
APPLICATION FILED OCT. 21, 1904.

976,963.

Patented Nov. 29, 1910.

4 SHEETS—SHEET 1.

Fig. 1.

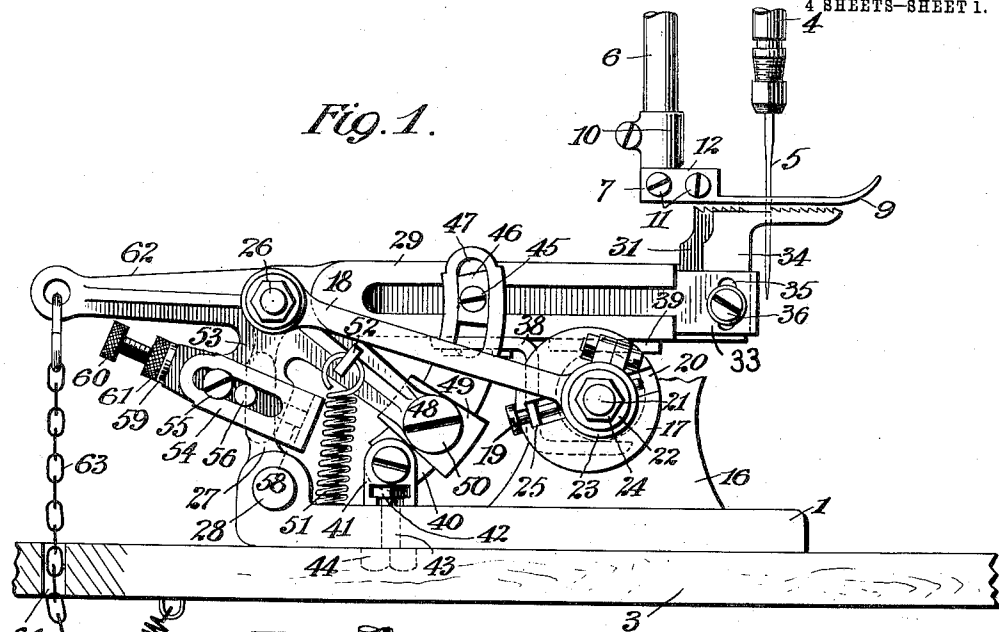
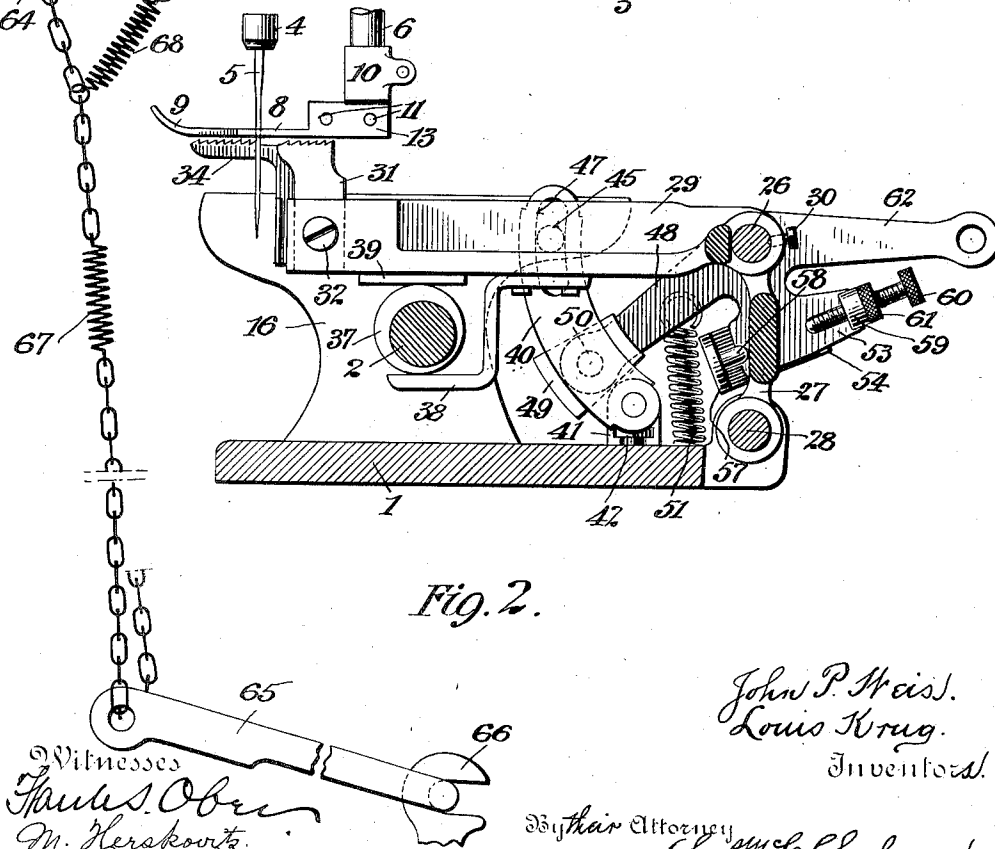


Fig. 2.



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Witnesses
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M. Herskowitz.

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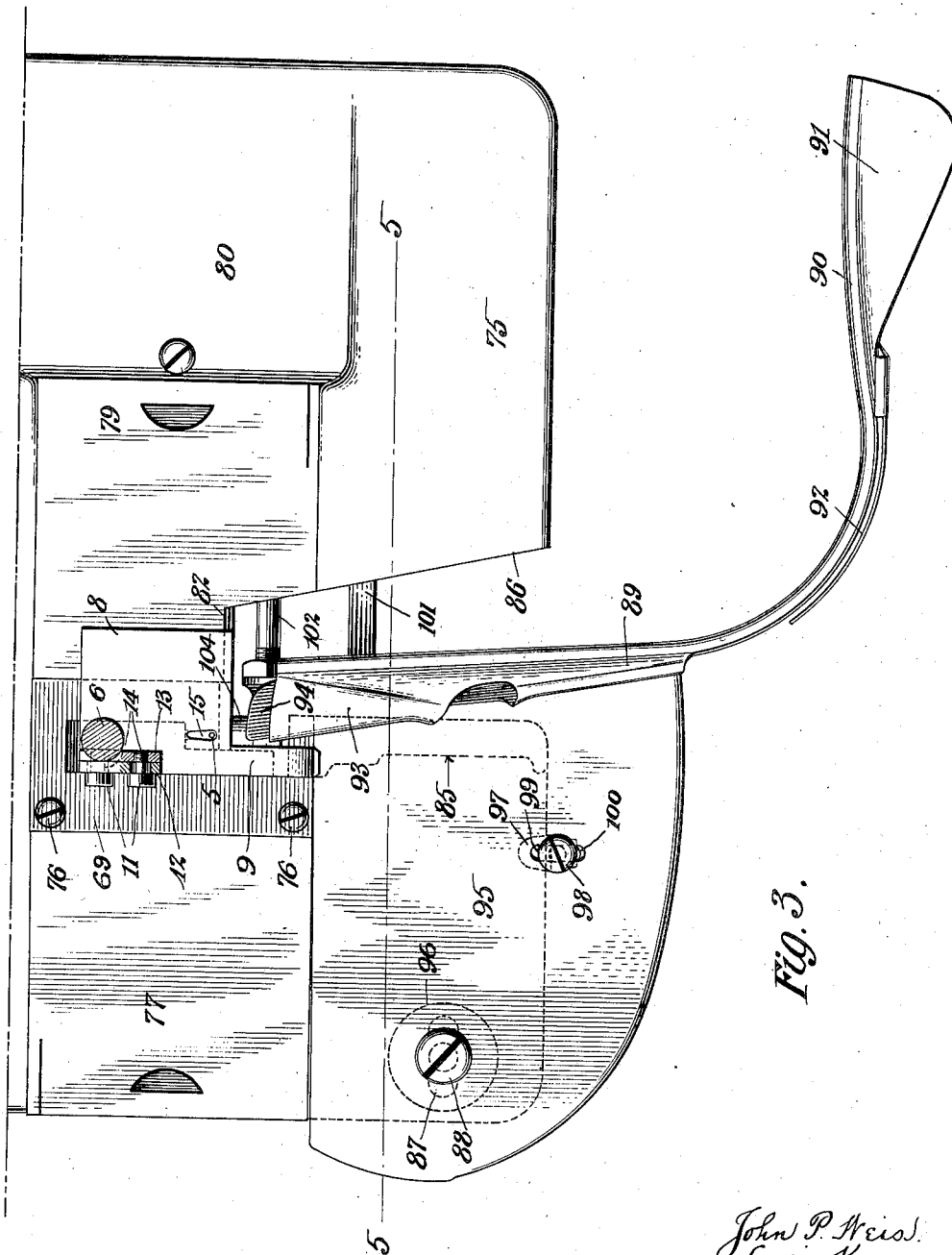


Fig. 3.

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4 SHEETS—SHEET 3.

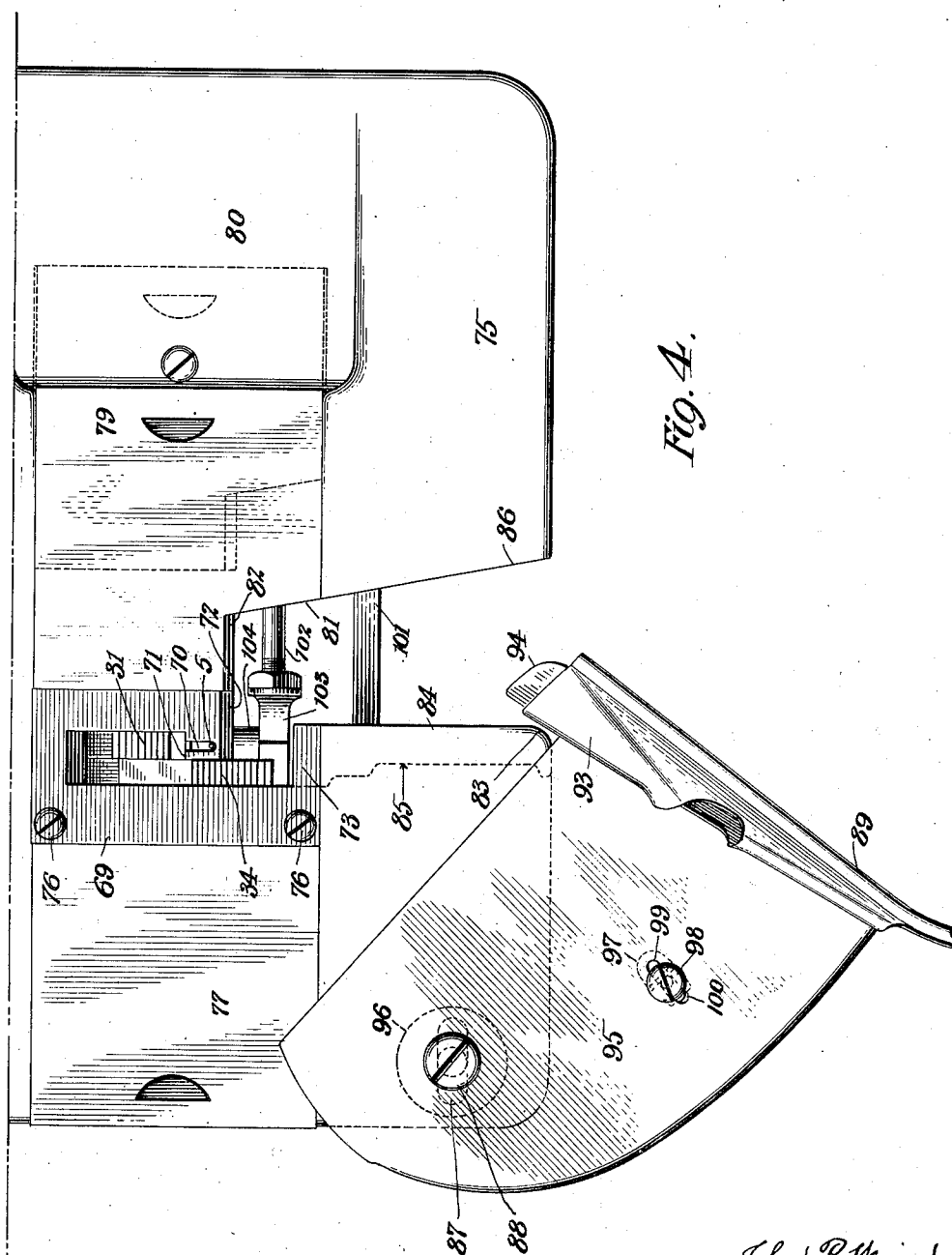


Fig. 4.

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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

JOHN P. WEIS AND LOUIS KRUG, OF NYACK, NEW YORK, ASSIGNORS TO METROPOLITAN SEWING MACHINE COMPANY, OF NYACK, NEW YORK, A CORPORATION OF NEW YORK.

COLLARET-MACHINE.

976,963.

Specification of Letters Patent.

Patented Nov. 29, 1910.

Application filed October 21, 1904. Serial No. 229,407.

To all whom it may concern:

Be it known that we, JOHN P. WEIS and LOUIS KRUG, both citizens of the United States, residing in Nyack, county of Rockland, and State of New York, have invented a new and useful Improvement in Collaret-Machines, of which the following is a description.

This invention relates to sewing machines, and particularly to that type which has recently been designated a collaret machine. This type of machine has been perfected to the extent of rendering it capable of performing a class of work heretofore impossible, that is, the attachment of a French collaret or ornamental binding to the edge of the neck opening of French balbriggans and other high class knit goods.

An object of this invention is to so construct and form the frame of a sewing machine, that it will be capable of receiving and properly supporting a folder of the kind which is necessary for manipulating collarets of the style noted.

Another object of this invention is to so modify, improve and construct the cloth or work plate of a sewing machine, that it will be capable of receiving the form of folder necessary to manipulate a collaret of the style noted and permit the free passage of the work thereover without retardation or hindrance.

Another object of this invention is to dispose a folder, capable of properly manipulating a collaret or other suitable binding material, in such manner that the latter may be attached perfectly to the neck of a garment of any character.

Another object of this invention is the production of automatic means, whereby collarets and other suitable bindings may be secured to the neck of a garment quickly and perfectly.

With the above objects in view, this invention consists in the parts, features, elements and combinations of parts and elements hereinafter described and claimed.

In the drawings, Figure 1 is an end elevation of so much of a sewing machine as is deemed necessary to illustrate the invention, the view showing a side elevation of the differential feeding mechanism, the presser-foot cooperating therewith and a portion of its bar, the lower end of the needle-bar and the needle clamped therein showing approxi-

mately its relation to the feed, and the means by which predetermined extremes of movement of one of the feed-dogs may be obtained without stopping the operation of the machine; Fig. 2 is a view similar to Fig. 1, showing the opposite side of the feeding mechanism, and omitting the supporting table and the treadle mechanism for actuating one of the feed-dogs; Fig. 3 is a top plan view of so much of the cloth-plate as is deemed to be necessary to illustrate the invention and show the application and disposition of the folder; Fig. 4 is a view similar to Fig. 3, but showing the folder broken off and its supporting-plate swung back from operative position, the presser-foot also being removed in order to show the position of the two feed-dogs in their relation to the needle and the line of stitch; Fig. 5 is a section on the line 5-5 of Fig. 3, a portion of the rear end of the plate being omitted and the scale of the figure being reduced; and Fig. 6 is a bottom plan of the cloth-plate shown in Fig. 5, the view showing only that portion necessary to an understanding of the invention, and all the parts of the machine being omitted, this view being intended to show the structure of the bottom of the cloth-plate and of the throat-plate.

Primarily, it should be understood that a collaret machine is one which includes in its structure a stitch-forming mechanism and a differential feeding mechanism capable of advancing two separate and independent pieces of work at the same or different speeds; in combination with a form of folder capable of manipulating and guiding to the stitch-forming mechanism a collaret or other suitable binding. That is to say, the machine should have essentially a stitch-forming mechanism of suitable character for attaching together the collaret or binding and the body material; a feeding mechanism operating upon both the binding and body materials and advancing the same simultaneously at such relative speeds as the nature of the goods and character of the work may demand; and a folder which will properly guide the binding material, turn or hem the edges thereof, and present the same in proper condition for attachment to the edge or edges of the body material, so that the line of stitching for attaching the two materials will pass through and run along the

hems of the binding and close to the edge of the body material. In other words, it should be understood that such a machine comprehends automatically operating mechanisms capable of simultaneously feeding two different kinds of material up to and beyond the stitching point of a suitable stitch-forming mechanism and, during the progress of said materials, hemming the edges of one and applying the hemmed edges properly to the edge of another material. The difficulties presented by this class of work have been such as to prevent the above manipulations in a single machine; and so far as applicants are aware, it has been heretofore impossible to apply a collarlet or other ornate binding to the neck of a garment smoothly and perfectly at one operation and on a single machine. The main difficulties in this class of work have been the inability of machines to properly feed the two different classes of material or goods, and to present such materials or goods properly to the stitch-forming mechanism for the attachment of the collarlet. These difficulties are in part due to the fact that the body material is often heavier than the collarlet material, that the stretch of one is very much in excess of the other, that the wales and greater stretch of the respective materials are at an angle respectively the one relatively to the other, that the feed mechanism has been incapable of so manipulating the body material and the collarlet that the excess of stretch of one over the other can be compensated for in order to present both the materials to the stitching point in substantially the same condition, and that the folder, heretofore, could not be properly positioned in the machine and relatively to the needle and feed for accurate and good work. A feeding mechanism capable of doing this work, practically and perfectly, is disclosed in the application of John P. Weis, Serial No. 169,683, filed Aug. 17, 1903, and the feeding mechanism illustrated herein is to be understood to be broadly the same as the differential feeding mechanism shown in such application.

The machine of this application is a straight-stitching, chain-stitch machine of either one or two threads, as may be desired, though it will be obvious that a stitching mechanism of any other character may be employed, such, *e. g.*, as a zigzag, over-seaming or other character of cross-stitch mechanism wherein is employed means for laying one or more threads in zigzag form upon the surface or over the edges of one or more pieces of material.

With the above essentials in mind, the following description will be clearly understood and the manner in which the difficulties heretofore experienced in the art have been overcome, will be appreciated.

Referring to the drawings, the numeral 1 indicates the frame of the machine, 2 the driving-shaft, 3 the table on which the frame is supported, 4 the needle-bar, 5 the needle which is suitably clamped in the bar, 6 the presser-bar, 7 the presser-foot suitably clamped to the presser-bar. The presser-foot 7 is provided with the wide body-portion 8 and elongated portion 9, the forward end of which is upturned. The function of the parts 8 and 9 will be presently described. The foot 7 is connected to the shank 10 by means of two screws 11, which pass through the vertical portion 12 of the foot and into a depending vertical portion 13 of the shank, as shown in Fig. 3, the part 12 of the foot being provided with elongated slots 14 for the reception of the screws 11 and to permit adjustment of the foot on and relatively to the shank 10. The foot is provided with the elongated aperture 15 for the passage of the needle. The main-shaft 2 is carried by and journaled in suitable standards 16, extending from the frame 1.

At its forward end, the main-shaft 2 is provided with a diametrically slotted disk 17, to which is adjustably connected one end of a connecting-rod 18, the connection and adjustment being effected by means common in the art, viz., a shouldered screw 19 swiveled in the disk 17 at one end of the diametric slot 20, the screw-threaded portion of the screw 19 passing through a lug or slide secured to the inner end of a pin or bolt 21, the latter carrying a sleeve 22 surrounded by the circular end 23 of the connecting-rod 18, and the parts being held in proper position by the nut 24. This construction permits the adjustment of the circular end 23 of the connecting-rod 18 across the disk 17 by merely turning the screw 19, the latter having only swiveling movement relatively to the disk, by reason of the shoulder 25. The opposite end of the connecting-rod 18 is suitably connected to the outer end of a short shaft 26 carried by the feed-rocking frame 27, journaled at 28 in the frame 1. The shaft 26, which is carried in the upper end of the rocking-frame 27, has fixed thereto the rear end of the feed-bar 29, said rear end being sleeved upon the shaft 26 and properly held by means of a screw 30 tapped therethrough and into the shaft 26. The feed-bar 29 carries in a socket at its free end the feed-dog 31, which may be adjustable vertically in said socket by means of the screw 32 tapped through one wall of the socket and impinging against the shank of the dog. On one side along its length,—see Fig. 1,—the feed-bar 29 is provided with an open-sided guide-way in which reciprocates freely the feed-bar 33, which carries at its free end the feed-dog 34 adjustable vertically in its bar by means of the elongated slot 35 in the latter, through which passes a

screw 36 which is tapped into the shank of the dog 34. The two feed-bars 29 and 33 obviously derive their vertical movements simultaneously and from the same means, the latter having an eccentric 37 carried by the main-shaft 2 and embraced by the bottom of the bar 29, and the angular arm 38 carried by said bar 29, there being ordinarily a shoe 39 secured to the bottom of the bar 29, upon which the eccentric operates.

It will now be seen that the feed movements of the dog 31 are regulated through the medium of the connecting-rod 18 and the adjustable connection of said rod to the disk 17 on the end of the driving-shaft. The feed movements of the dog 34, which will be designated the main dog, because it operates upon the body material to which the binding or collaret is applied, are produced by means of the curved lever 40, pivoted at its lower end to an adjustable lug or bracket-piece 41 having in its bottom a T-shaped groove for the reception of the head 42 of a bolt 43, which passes through the frame 1 of the machine and which secures the lug 41 adjustably to the frame 1 by means of the nut 44. This construction permits the adjustment of the lug 41 on the frame or bed 1, so as to properly position the lever 40 relatively to the feed-bars. The upper end of the lever 40 is pivotally connected to the bar 33 by means of a screw 45 passing through a shoe 46 located in the slot 47 of the lever 40, said screw being tapped into the bar 33. This construction enables the shoe 46 to swivel or pivot upon the screw 45 and thus freely slide in the elongated slot 47 of the lever 40. Obviously, actuation of the lever 40 will cause the bar 33 and its dog 34 to have their feed movements. The actuation of the lever 40 and the regulation of the feed movement of the main feed-bar 33 are produced by means of a three-armed lever journaled at its vertex upon the shaft 26 carried by the rocking-frame 27. One arm 48 of this lever is provided with a shoe 49 pivotally connected thereto by means of the screw 50, said shoe embracing and sliding longitudinally on the lever 40.

A spring 51, connected at one end to the frame 1 and at its other end to a lug 52 on the arm 49, normally holds the latter depressed, or in its lowermost position. The central short arm 53 of the three-armed lever depends below the pivot of said lever and has connected thereto an angular, slotted bracket 54, by means of a screw 55 extending through said slot and tapped into said arm, the head of said screw embracing the bracket and thus holding it securely and adjustably to the arm 53. A pin 56 projects from the arm 53, through the elongated slot in the bracket 54, and acts as a limit for the adjustment of said bracket in one direction and also prevents the bracket from swinging

on its clamping screw 55, which latter also acts as a limit for the adjustment of the bracket 54 in an opposite direction. The bracket 54 has the angular portion 57, provided with a lug or stop 58, which contacts with the web-portion of the rocking-frame 27, see Fig. 2. The arm 53 is also provided with an angular portion 59, carrying an adjustable stop or screw 60, which contacts with the opposite side of the said web-portion of the rocking-frame 27 and is held in adjusted position by means of the jam-nut 61. The third arm 62, of the lever, has connected to it in any suitable manner the chain 63, or other suitable device, which passes through the aperture 64 in the table 3 and is connected at its lower end with the treadle 65 pivotally supported at 66, either on the floor, table or bench on which the machine is supported. At some point between its ends, the chain 63, or other connecting device, is provided with a coiled spring 67 which, when pressure is applied to the treadle 65, causes the chain to transmit a yielding pull upon the arm 62 of the three-armed lever and also prevents the vibration of the latter, caused by the rocking-frame 27 during the operation of the machine, from being transmitted to the foot on the treadle. The interposition of the spring 67 also takes up any slack in the chain, which may occur between its ends, and thus prevents said chain from rattling during the rapid operation of the machine. To still further prevent rattling and to take up slack in the chain 63, the spring 68 is connected to the chain and to the table or frame of the machine. It will be noted that the spring 51, connected to the arm 49, normally keeps the stop 58 in contact with the web of the frame 27, whatever the initial adjustment may be, and after the adjustment has been altered by depressing the arm 62, of the three-armed lever, and the latter has been released, the spring 51 will lower the stop 58 into contact with the web of the rocking-frame 27.

Now, viewing Fig. 4, it will be seen that the main feed-dog 34 works in an elongated, open-sided slot in the throat-plate 69 close beside the needle-slot 70 and beside the path of reciprocation of the needle, and partially in advance and partially behind the stitching point, and that the auxiliary dog 31 operates in the widened portion of the slot in the throat-plate directly behind the needle-slot 70 and, consequently, behind the stitching point or path of reciprocation of the needle. By this arrangement, it will be obvious that the main feed-dog 34 operates entirely upon the body material and that the auxiliary dog 31 operates directly upon the binding material, but that after the two materials have been stitched together said auxiliary dog has the function of advancing

the combined work, thus causing the same to be fed from the stitching point simultaneously, and at the same speed, irrespective of the speed of the main dog 34 in advancing the body material to the stitching point. This disposition of the two dogs also prevents any drag by the body material at either the stitching point or upon the auxiliary dog, the main dog always advancing the body material properly to the stitching point and keeping said material up to its proper line and position for attachment of the hemmed edges of the binding material. In practice, the movements of the two feed-dogs are so regulated as to have a traveling and feeding speed of such character, as to properly feed the two different materials in the manner required for perfect work; that is to say, according to the character of the materials, the two feed-dogs may be given the same speed or different speeds, the one having movements either faster or slower than the other. The amount of movement imparted to the main feed-dog depends upon the position of the sliding shoe 49 relatively to the pivotal support of the lever 40, it being obvious that the farther the said shoe is placed or moved from the pivot of the lever 40, the shorter will be the movement of the feed-dog 34, and vice versa; and as the curvature of the lever 40 is struck from a center coincident with the axis of the shaft 26, and as the arm 48 constitutes a radius of the same circle, the movement of the shoe 49, either toward or from the pivot of the lever 40, will not change the initial position of the dog 34. The amount of movement imparted to the auxiliary feed-dog 31 is regulated by the adjustment of the pin 21, relatively to the center of the disk 17 or shaft 2, along the slot 20. The stop 58, which contacts with the web-portion of the rocking-frame 27, according to its adjustment, constitutes an initial position or regulation for the disposition of the shoe 49 on the lever 40, and the adjustment of the stop-screw 60 constitutes a limit for the adjustment and disposition of the shoe 49 upon the lever 40 in the opposite direction. Having thus determined these adjustments, it is obvious that a shift from one to the other can be immediately produced by the depression of the treadle 65 and the operation of the arm 62 of the three-armed lever, while the machine is in operation, and without disturbing the operation of the stitch-forming mechanism, so that, according to the demands of the work, the relative feed of the two materials can be simultaneously changed; and any regulation between the two extremes of adjustment described can be produced by the proper amount of pressure upon the treadle 65, irrespective of the limiting stop 60, provided the operative be sufficiently expert.

The throat-plate, in advance of the feed-dog 31, is provided with the solid portion 71 which helps to form the guide-way for the feed-dog 34 and also affords support for the bottom fold at the hem of the binding material or collaret. In advance of the needle-slot 70, the throat-plate is provided with the beveled end-portion 72, provided by cutting out the throat-plate near its forward end at the inside, along the length of the beveled end 72, thus also leaving the extending tongue 73 at the forward end of the throat-plate, which is considerably shorter than the width of said plate. On its bottom and at its free end the tongue 73 is beveled as shown at 74, Fig. 6. The throat-plate is secured in proper place on the cloth-plate 75 by means of the screws 76. The outer slide-plate 77 runs in suitably formed grooves in the cloth-plate 75 and is intended to cover certain portions of the machine and also the screw-holes 78, see Fig. 6, through which the cloth-plate is secured to the supporting-standard of the frame. The inner slide-plate 79 also runs in grooves in the cloth-plate 75 and that portion of said cloth-plate immediately in rear of the seat of the slide 79 is depressed, as shown at 80, so that the said plate 79 may be freely removed rearwardly. The inner end and the forward edge of the slide-plate 79 is cut away as at 81 and the forward edge of the cut-away portion is beveled, as at 82, to correspond with and to extend in continuity of the beveled portion 72 of the throat-plate. The function of the structural features of the throat-plate and the slide-plate 79 will be presently described. The forward edge of the cloth-plate 75, is also cut away, the material being removed so as to form a slot or opening in continuity of that formed by the cut-away portions of the slide-plate and throat-plate. The corner 83 of the cloth-plate is rounded and the edge 84 is beveled on the bottom at 85, this bevel corresponding with the bevel on the bottom of extension 73 of the throat-plate. The edge 86 of the cloth-plate, at the point where the latter is cut out, may be inclined in order to make the opening at the front edge of the cloth-plate slightly larger for the proper manipulation of the folder, as presently described. The cloth-plate is also provided with an elongated slot 87 for the admission of the shank of the screw 88 which secures the folder in place on the cloth-plate 75. Coöperating with the stitch-forming and feeding mechanisms, we have provided a folder which is, in all material respects, substantially the same as that shown, described and claimed in our application filed of even date herewith Serial Number 229,408; but, for the sake of brevity in this specification, the folder is only generally shown and described. It will be understood, however,

that other forms of folders than those described in our said application may be employed in connection with the differential feed, and be within the scope of our invention, as covered by the combination claims appended to this description. The folder illustrated is of the form which we have designated as "crescent" and is generally indicated by the numeral 89. This folder has a neck-portion 90 extended at an angle to the body portion, which lies adjacent the stitching point and substantially in the line of the feed. The neck-portion extends substantially parallel with the length of the cloth-plate and is provided with oppositely disposed bending-wings 91; the top one of which only is shown in Fig. 3, and with a brace 92 for guiding and supporting the binding material or collaret. The folding portion is indicated by 93 and this folding portion is provided with oppositely disposed extensions or fingers 94, only one of which is shown in Figs. 3 and 4, but both of which are shown in the sectional view of Fig. 5. The folder is held in place upon the cloth-plate 75 by means of supporting-plate 95, which is soldered or otherwise rigidly secured to the body-portion of the folder and over which the body material is fed, and by which said material is supported in proper position between the folding scrolls of the folding-portion 93. The plate 95 is rigidly held upon the cloth-plate 75 by means of the binding-screw 88, the head of which bears on the top of said plate 95 and at its end, or at the bottom of the cloth-plate, is provided with a thumb-screw 96, (shown in dotted lines, Figs. 3 and 4), the thumb-screw being turned upon the stem of the screw 88 and against the bottom of the cloth-plate, whereby the folder is firmly held. Adjustment of the folder is secured by means of the elongated slot 87 in the cloth-plate. This means for clamping and adjusting the folder upon the cloth-plate is suggestive merely, for it will be understood that various modifications of this clamping and adjusting means may be made, within the skill of any mechanic, without departing from the spirit and scope of our invention, which involves the fundamental principle of so securing the folder to the cloth-plate that it will be properly and rigidly held during the operation of the machine, and providing such adjusting means that the projecting ends 94 of the folder may be approached closely to the stitching point in the line of feed of the auxiliary dog 31 and also closely to the side of the main dog 34.

In order to properly position the delivery-end of the folder relatively to the stitching point and feed-dogs as described and limit, without care on the part of the operative, the movement of said folder toward the stitch-

ing point, an angular lug 97 (shown in dotted lines in Figs. 3 and 4) is secured to the bottom of the supporting-plate 95, by means of the clamping-screw 98 passing through the elongated slot 99, in the supporting-plate 95, and tapped into said lug 97. By elongating the slot 99, adjustment of the lug 97 on the supporting-plate 95 is secured, said lug having a portion 100 projecting into said slot 99 in order to prevent the lug from turning upon the stem of the screw 98 and also to limit the adjustment of the lug on the plate 95. The lug thus secured to the supporting-plate, when the latter is in the position shown in Fig. 3, slides under the edge of the cloth-plate 75 and limits the movement of the delivery-end of the folder 94 and also prevents vertical movement of the folder relatively to the cloth-plate.

Now referring to the construction of the throat-plate and of the slide-plate 79, heretofore described, it will be seen that the beveled portion 72 of the throat-plate will permit the extreme ends 94 of the folder to closely approach the stitching point or point of penetration of the needle and also prevents the collaret and body materials from catching or dragging on the sharp edges or angle of the throat-plate, thus permitting the work to approach the needle or point of stitching in substantially the same plane, or a plane slightly below that of the surface of the throat-plate. This is an important feature, as will be clearly understood upon inspection of the sectional view of Fig. 5. Likewise, the cutting away of the slide-plate 79 permits the forward or delivery-end of the folder 94 to be moved to and normally set in a position which will present the hemmed edge of the collaret and the edge of the body material in the line of feed of the auxiliary dog 31; that is to say, the scroll-end of the folder must be allowed to approach closely to the inside edge of the feed-dog 34, to present the hemmed edges and the edge of the body material so that the line of stitching will be disposed sufficiently far from the edges of both as to place the line of stitching so that it will positively and effectively secure the several parts together. The beveled portion 82 of the slide-plate 79 permits the folded or outer edge of the binding or collaret material to be smoothly fed forward without drag or hindrance. In other words, by providing the beveled surfaces 72 and 82 on the throat-plate and slide-plate, respectively, the bottoms of the materials operated upon are allowed to smoothly slide up to, upon and over the surfaces of the said plates.

Now, upon reference to Figs. 3, 4, 5 and 6, it will be understood that the folder, irrespective of its specific construction, is let into, and a portion of it extends under the

cloth-plate and, hence, is capable of disposition and adjustment so that its delivery-end can be placed, as previously described, directly in the line of the auxiliary feed-dog 31 and in the vertical plane passing longitudinally through substantially the center of said feed-dog and including the needle. To permit the adjustments and disposition described, the vertical web of the cloth-plate, which depends from the bottom and usually extends around both sides and the end thereof, is cut away vertically, as at 101, thus permitting the folder to be let into the cloth-plate properly and allowing its delivery-end to properly approach the needle and feeding positions, as described. The looper-actuating rod 102 in the average machine, and also its head 103, are usually disposed considerably below and out of the way of the folder as we purpose placing it, and in this machine the looper-carrier 104 is projected laterally to a considerable extent so as to support the looper 105 in such position that it will travel beside and close to the needle and project into the groove 106 in the bottom of the throat-plate, which also surrounds the needle-slot 70, thus preventing the looper-carrier and the looper from interfering with the delivery-end of the folder and also disposing the looper beyond or under the beveled edge of the throat-plate. Hence, the folder can be placed, if desired, close to the stitching point and close to the side of the main dog 34; and, viewing Fig. 5, it will be seen that by beveling the edge 84 of the cloth-plate, as at 85, and the outer end of the extension 73 of the throat-plate, as at 74, the lower portion of the folder is allowed to be extended under the cloth-plate for the purposes already described.

It will now be seen, upon reference to Fig. 3, that the broad portion 8, of the presser-foot, is projected beyond the inner edge of the throat-plate and quite a distance over the adjacent end of the slide-plate 79, and also extends forward to a point or a vertical plane which includes the extreme forward edge of both the throat-plate and the slide-plate at the beveled portions 72 and 82. It will also be seen that the elongated portion 9, of the presser-foot, extends over and longitudinally of the main dog 34 and that the curved portion extends over the extension 73 of the throat-plate. The broad portion 8 of the foot coöperates with the auxiliary feed-dog 31 and the elongated slot 15 therein and registers with the elongated slot 70 in the throat-plate. It will be obvious that the elongated toe 9 is for the purpose of pressing upon and aiding in the feed of the body material, thus coöperating with the main dog 34, and that the broadened portion 8 of the foot coöperates with the auxiliary dog 31, thus aiding in traversing both the collaret material and the edge of the body

material, and also coöperating with the adjacent portions of the throat-plate and the slide-plate to hold the material of the body and of the collaret in flat condition and prevent the same from curling up around the presser-foot and into the path of the needle, thus avoiding interference of the collaret with the stitching, after the same has left the delivery-end of the folder.

It will now be understood that the collaret material is led into the folder at the receiving-end 91, passes along the neck of the same and through the folding portions 93, and drawn beyond the ends 94 in the path of reciprocation of the needle and into engagement with the auxiliary feed-dog 31, and between the latter and the broadened portion 8 of the presser-foot; and that the body material is placed on the supporting-plate 95 and pushed forward under the up-turned end of the presser-foot portion 9 and below the top folding portion 93, and forward into engagement with the primary dog 34 and between the latter and the portion 9 of the presser-foot. In this condition of the two materials, the auxiliary dog 31 is in engagement with the collaret material, and it will thus be seen that the moment the stitching begins the feed-dogs engage the two materials, respectively, as described, to advance the same to and carry the same from the stitching position or path of reciprocation of the needle.

From the description of the mechanical features, it will be understood that the folder may be thrown back from operative position,—see Fig. 4,—by releasing the thumb-screw 96, so as to allow the folder to swing or pivot on the clamping-screw 88. In this condition the collaret may be placed in the folder, or the collaret may be started into the folder and the latter subsequently attached to the cloth-plate and properly set in position. The position of the line of stitching along the hemmed edges of the collaret depends upon the adjustment of the folder in the machine, the means described for adjusting the folder enabling the latter to be placed in any position desired, relatively to the stitching point, thus enabling the line of stitching to be disposed in the manner desired and as close to the hemmed edges of the collaret as may be required.

Various sizes of folders may be employed, as will be understood, and the adjusting means provided between the supporting-plate 95 and the cloth-plate of the machine enable folders of different sizes to be disposed with equal accuracy, both with regard to the disposition of the line of stitching in the work and the location of the delivery-end of the folder relatively to the stitching point; but it will be understood that, when a very large folder is used, it will reach considerably farther below the cloth-plate and

toward the looper mechanism and, therefore, provision has been made, by beveling the edge of the cloth-plate at 85 and the end of the extension 73 of the throat-plate at 74, to enable a folder, no matter of what size, to be properly disposed relatively to the line of feed of the auxiliary dog and also to the path of reciprocation of the needle. And by cutting away the cloth-plate, rear slide-plate and throat-plate as described, together with the webbing, at 101, depending from the cloth-plate, means have been provided by which the folder can present the work to the needle and the feed in the proper plane, or on the proper level, to enable both the feed-dogs to firmly, positively and effectively engage and traverse the work; and, coupled with these means, the beveling of the slide-plate at 82, and the throat-plate at 72, permits the easy and retarded progress of the collaret material without drag upon the latter, which would cause the edges to be drawn away from the stitching point. Hence, the collaret is properly advanced to the stitching point without detriment to the work or the effectiveness of the stitching operation.

It will now be seen, from the mechanical features above described and the disposition of the folder upon the cloth-plate, and relatively to the feed and the stitch-forming mechanism, that means have been provided for permitting the folder, irrespective of its size, form or construction, to be properly disposed in the machine for the purpose of effectively manipulating the binding or collaret material, for the purpose of hemming the edges thereof and applying the same to the edge of the body material properly, and without puckering or unduly stretching one of the materials relatively to the other. In other words, by providing a differential feeding mechanism, the adjustment of the several dogs of which can be regulated during the operation of the machine, means have been produced for properly handling the two materials before, at and beyond the stitching point; and by constructing the cloth-plate, throat-plate and slide-plate as described, a folder or other analogous form of attachment can be properly located, relatively to the feeding and stitch-forming mechanisms. And, upon this latter construction, we desire to lay particular stress, inasmuch as the same involves an important feature of our invention; for, we are not aware that, prior to our invention, a machine has ever been so constructed that a folder could be let into the cloth-plate so that a portion thereof would extend below the surface of said cloth-plate and underlap the edge thereof, and so that the entire folder, and especially its delivery-end, could be properly positioned relatively and very close to the stitching point and feed-

ing mechanism, without interfering with one or more of the elements of the stitch-forming mechanism or of the feeding mechanism.

From the above description it will be obvious that a machine has been produced which enables a folder to be disposed close to the stitching point for the purpose of feeding to the stitch-forming mechanism both the edge of a body garment and the hemmed edges of a collaret; that a machine has been produced which will fold and present in proper form and condition a collaret for attachment to the neck of a garment; that a machine has been produced by means of which the folder can be approached closely to the stitching point and disposed directly in the line of the feed and on a level or in the same plane with the surface or plane of the throat and cloth plate and in such position that the feed-dog or feeding mechanism can properly engage and present the work to the stitch-forming mechanism and feed the same from the stitching point perfectly and effectively for the desired purposes. It will also be understood that a machine has been produced by means of which collarets of different forms can be manipulated and the edges thereof hemmed and properly presented to the stitch-forming mechanism and applied to the edge of the body material; and whereby a collaret can be simultaneously fed, hemmed and applied to a body garment or the edge of the neck thereof. It will be obvious also that various changes, both in the folder, the form of the throat-plate, slide-plate and cloth-plate, may be made without changing the nature and principle of this invention; and it is to be understood that the parts, features and mechanism disclosed in this application are merely suggestive of a form of mechanism and machine for doing the work described and contemplated which has been proved to be, in principle, both effective and practical. It will be seen also that means have been provided whereby the folder may have adjustments bodily and especially at its delivery-end in almost universal direction; but of these adjustments, it will be clear that it is important that means be provided permitting adjustments toward and from the stitching position substantially in the line of the feed, and back and forth across the line of the feed in front of the stitching point or position, whereby the delivery-end of the folder may be disposed close to the stitching point, close to the side of the main feed-dog 34 and directly in the line of the feed of the auxiliary dog 31.

From the above description it will be distinctly understood that, whatever changes may be made in the form and character of the mechanism, parts and elements hereinabove described, the principle of our invention will not be departed from, in one of its

features, by providing any character of folder adapted for hemming the edges of one piece of material preparatory to the application of said material to the edge of another piece of material, and disposing such folder partially below and partially above the cloth-plate of the machine, to lead portions of the work up to the stitching point or stitch-forming mechanism in a plane and in the manner substantially as described. In other words, we believe ourselves to be the first to adapt a sewing machine to collar work, and that we are the first to discover a means by which a collar may be properly and effectively applied to the body material, and that, irrespective of the character of the folder or the class of work to be performed, we are the first to dispose a folder or hemmer, or both, in the manner as hereinabove described with reference to the cloth-plate, the path of the feed, the plane of the throat-plate and the stitching point.

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

1. In combination, a sewing-machine having a work-plate; a stitch-forming mechanism; a feeding mechanism, and means for causing the same to traverse the work in a defined path; the work-plate being slotted from its edge to a point in advance of the stitching position; a folding-device; and means for pivotally supporting the folding-device upon the work-plate, comprising a work-supporting plate sustaining said folding-device in the slot of the work-plate with a portion above and a portion below the latter and its delivery end close to the stitching position; whereby a binding may be folded upon the work and the two delivered together close to the stitching position, and the folding device may be swung into and out of position at will.

2. In combination, a sewing-machine having a work-plate; a stitch-forming mechanism; a feeding mechanism, and means for causing the same to traverse the work in a defined path; the work-plate being slotted from its edge to a point in advance of the stitching position; a folding-device; means for pivotally supporting the folding-device upon the work-plate, comprising a work-supporting plate sustaining said folding device in the slot of the work plate with a portion above and a portion below the latter and its delivery end close to the stitching position, and means whereby the folding-device may be adjusted on the work-plate so as to position its delivery end properly relatively to the feeding mechanism and the stitching position; the several devices and mechanisms also cooperating whereby a binding may be folded upon the work and the two delivered together close to the stitch-

ing position, and the folding device may be swung into and out of position at will.

3. In combination, a stitch-forming mechanism; feeding mechanism comprising a main and an auxiliary feed-dog; a folding-device for guiding and folding a strip of material; a work-supporting plate, connected to the folding-device, which supports the body material in position to have the binding applied thereto; and means for pivotally and adjustably sustaining said plate, whereby the folding device may be swung into and out of position at will and may also be adjusted so as to locate its delivery end in front of the stitching position, in line with the main feed-dog and beside the auxiliary feed-dog.

4. A sewing-machine having stitch-forming mechanism, feeding mechanism, and a folding-device, in combination with a cloth-plate having a throat-plate the forward end of which latter is provided with an open-end slot and a beveled portion in advance of the stitching point, and means for pivotally supporting the folding-device on the cloth-plate so that it may be swung into position with its delivery-end within said slot and into cooperation with the beveled portion of the throat-plate, and a portion of said delivery-end in rear of said beveled portion.

5. A sewing-machine having stitch-forming and feeding mechanisms, and having its cloth-plate provided with a slot extending from its front edge to the stitching position; a folding-device having a work-supporting plate extending horizontally from its left side; means for pivotally supporting said folder upon said cloth-plate so that it may lie in said slot and be swung into and out of the same; and means for limiting the swinging movement of said folder so as to accurately position its delivery-end relatively to the stitch-forming and feeding mechanisms.

6. In combination, a stitch-forming mechanism; a feeding mechanism having a main and an independent auxiliary feed-dog; means for longitudinally reciprocating said feed-dogs for feeding the work; a throat-plate having a cut-out portion in which one of said dogs works and in rear of which the other of said dogs works; a folding-device for guiding and folding a strip of material; and means for supporting the folding-device in cooperative relation to the stitch-forming and feeding mechanisms, with its delivery end in said cut-out portion of the throat-plate and in advance of the stitch-forming mechanism and one of the feed-dogs and close alongside of the other feed-dog.

7. A sewing-machine provided with a cloth-plate having an opening therein extending transversely thereof, a portion of said plate along the opening being beveled

or undercut, in combination with a folder set within the opening, and means for supporting the folder in the position stated and for rendering said folder adjustable within the opening and under the beveled edge of the cloth-plate.

8. A sewing machine having in combination, a stitch-forming mechanism; a feeding mechanism; a folding-device; a cloth-plate having an opening therein extending in the direction of feed, and a portion of the plate along the opening being beveled; means for supporting the folding-device within said opening partially above and partially below said plate; and a presser-foot cooperating with the feeding-device and having a portion extending over the cloth-plate laterally beyond the delivery-end of the folder, whereby, as the material is delivered at the stitching position by the folder, the foot will prevent the edges of the same from curling vertically and interfering with the needle.

9. A sewing-machine including a stitch-forming mechanism, a differential feeding mechanism, a folding-device, and a cloth-plate having a cut-out portion adjacent the stitching position, in combination with means whereby the feeding mechanism may be adjusted to vary its action on the work during the operation of the stitch-forming mechanism, and means for adjusting the folding-device in the cut-out portion of the cloth-plate.

10. A sewing-machine having stitch-forming mechanism including a needle and an oscillating looper; a feeding-mechanism; a cloth-plate through which the dogs of the

feeding mechanism work; said plate having a groove in its bottom, surrounding and extending laterally of the needle aperture, in which the looper operates; said plate also having a cut-out portion forming a recess; and a folding-device carried by the cloth-plate with its delivery-end in said recess, and extending over a portion of the looper mechanism close to the looper; whereby the folding-device and feed-dogs may be grouped closely about the stitching position without interference with the needle and looper.

11. A sewing-machine having stitch-forming mechanism including a looper operating below the cloth-plate, a cloth-plate having in its bottom a groove in which the looper operates, a feeding device operating through the cloth-plate adjacent the said groove, and a folding device supported with a portion below the cloth-plate adjacent the said groove and in advance of the said looper.

12. A sewing-machine having a cloth-plate provided with a groove in its bottom, a stitch-forming mechanism including a looper disposed so as to operate in said groove, and a folding device disposed in advance of the looper adjacent the groove and with a portion extending below the cloth-plate.

In testimony whereof we have hereunto signed our names in the presence of two subscribing witnesses.

JOHN P. WEIS.
LOUIS KRUG.

Witnesses:

W. V. MILLER,
JAS. W. RITCHINGS, Jr.