

W. L. DIXON.
MACHINE FOR FOLDING COLLAR BLANKS AND THE LIKE.
APPLICATION FILED NOV. 12, 1903.

932,769.

Patented Aug. 31, 1909.
5 SHEETS—SHEET 1.

Fig. 1.

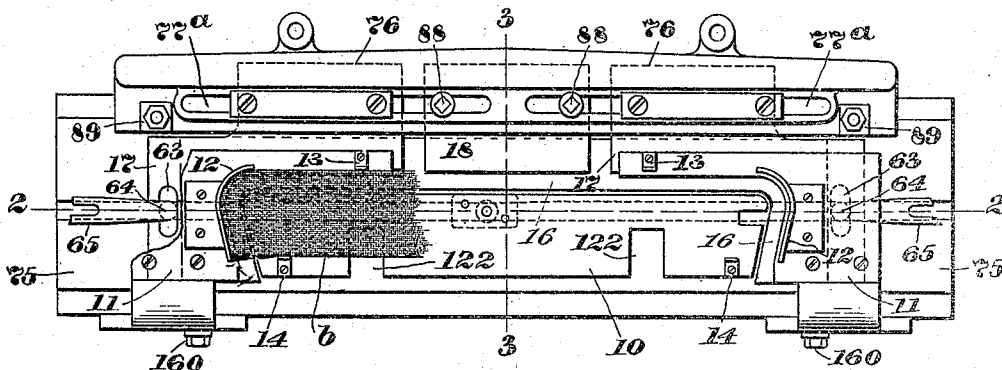


Fig. 2.

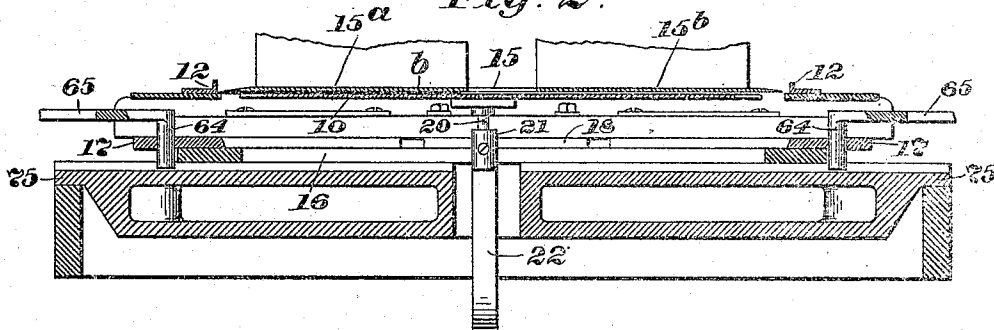


Fig. 3.

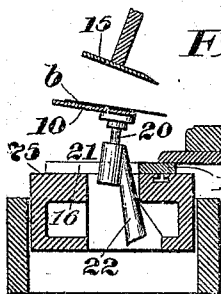


Fig. 4.

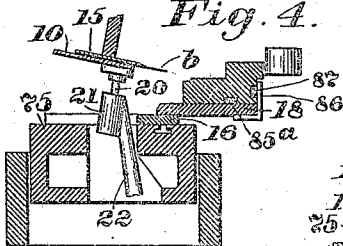


Fig. 5.

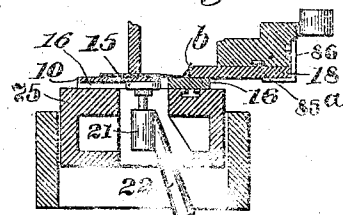
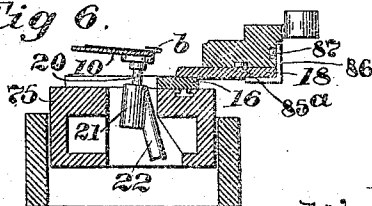


Fig. 6.



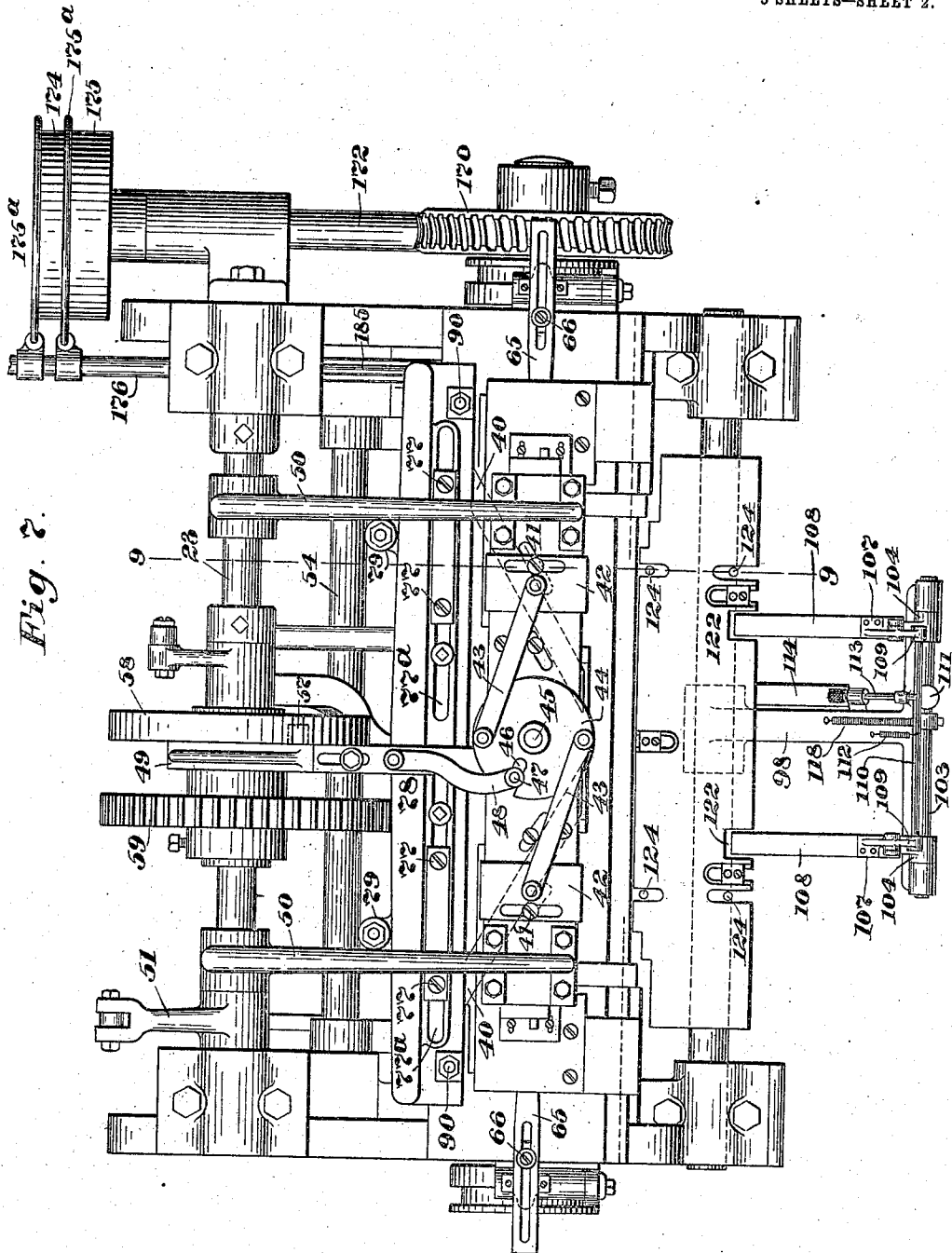
Witnesses:
Horace A. Grossman.
Ernest S. Emery

Inventor:
Walter L. Dixon.
by Emory Booth Powell
Attys.

W. L. DIXON.
MACHINE FOR FOLDING COLLAR BLANKS AND THE LIKE.
APPLICATION FILED NOV. 12, 1903.

932,769.

Patented Aug. 31, 1909.
5 SHEETS—SHEET 2.



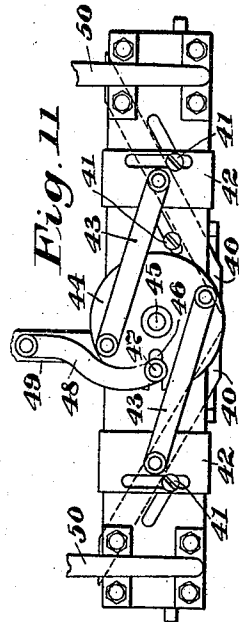
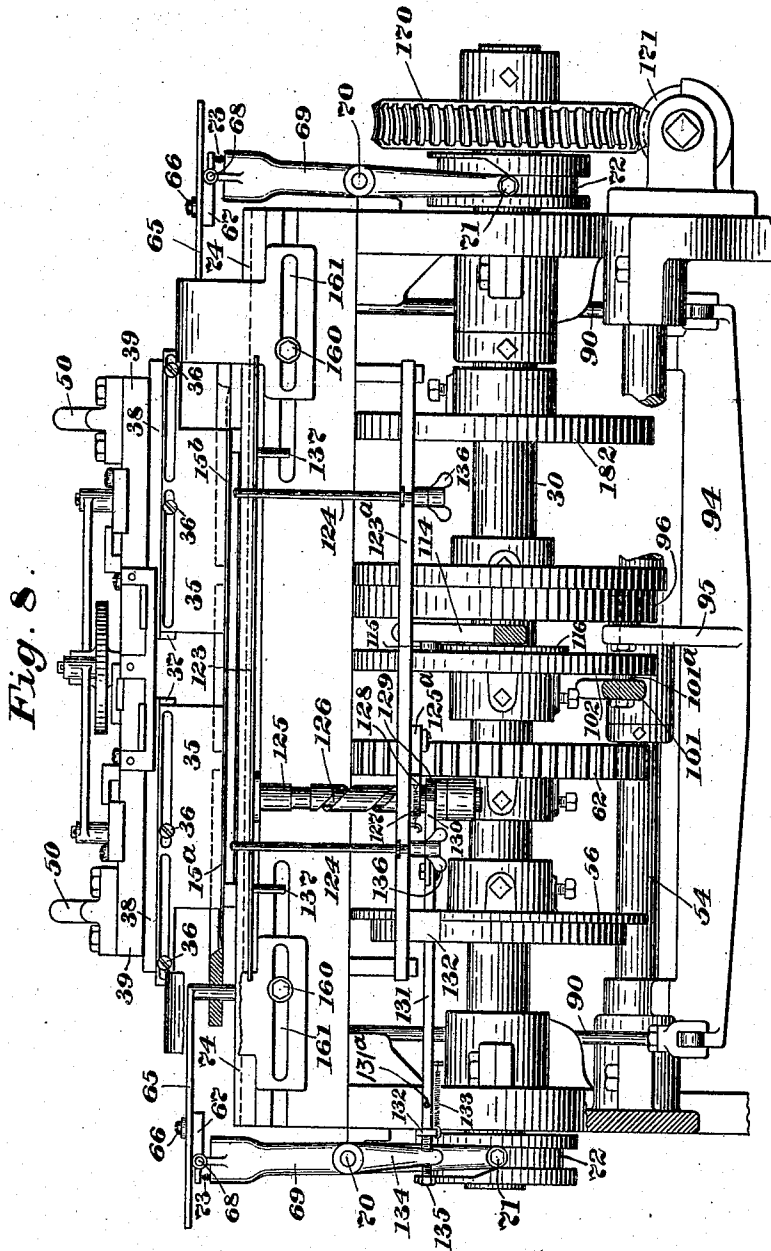
Witnesses:
Horace A. Crossman.
Ernest S. Emery

Inventor:
Walter L. Dixon
by Emery, Booth & Powell
Attys

W. L. DIXON.
MACHINE FOR FOLDING COLLAR BLANKS AND THE LIKE.
APPLICATION FILED NOV. 12, 1903.

932,769.

Patented Aug. 31, 1909.
5 SHEETS—SHEET 3.



Witnesses:
Horace A. Crossman.
Ernest J. Emery

Inventor:
Walter L. Dixon.
by Emery, Booth & Powell
Attys.

W. L. DIXON.
MACHINE FOR FOLDING COLLAR BLANKS AND THE LIKE.
APPLICATION FILED NOV. 12, 1903.

932,769.

Patented Aug. 31, 1909.
5 SHEETS—SHEET 5.

Fig. 12

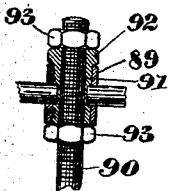
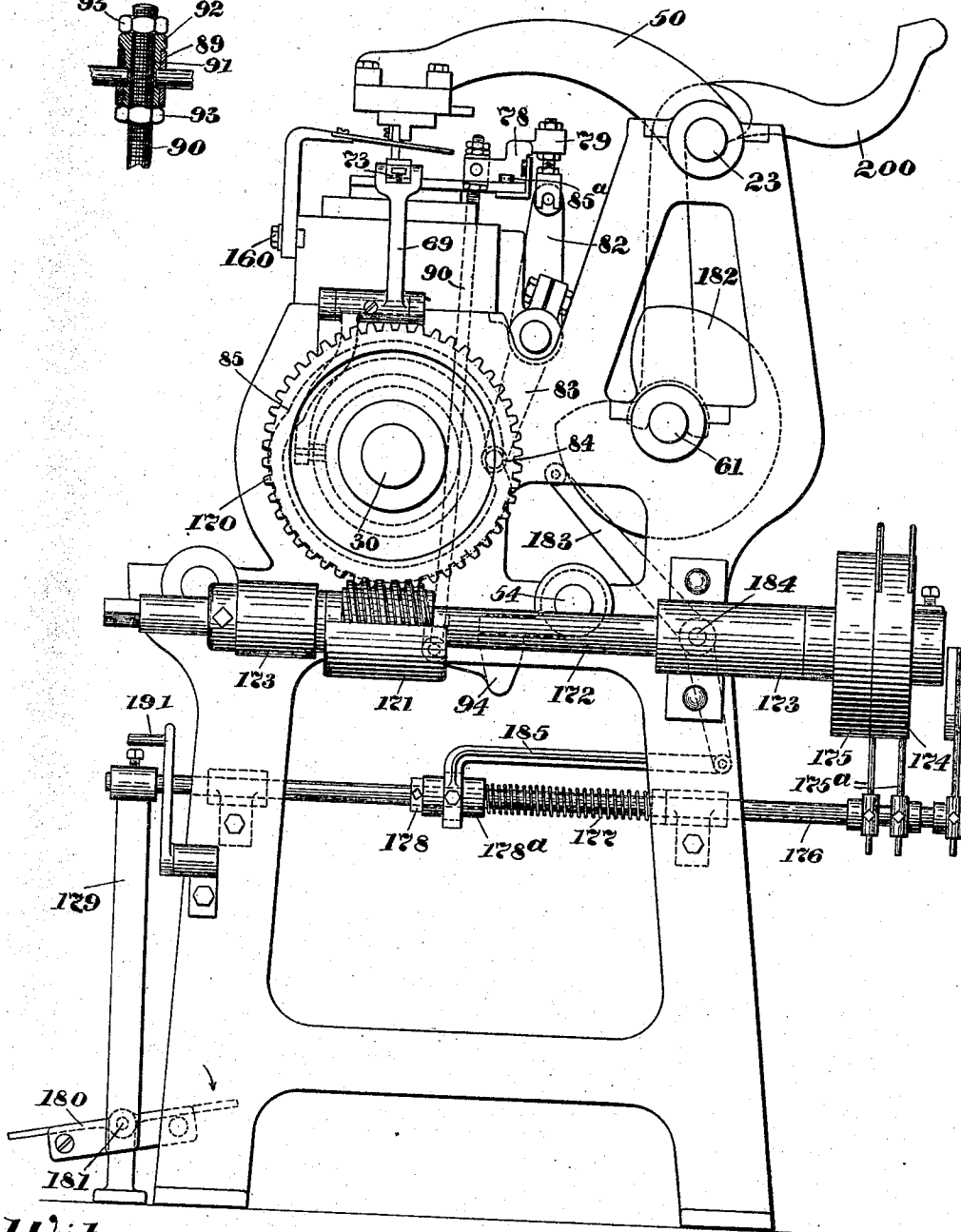


Fig 10



Witnesses:

Horace A. Crossman.
Ernest J. Emery

Inventor:
Walter L. Dixon.

by Emery, Booth & Powell
Attys.

UNITED STATES PATENT OFFICE.

WALTER L. DIXON, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO REECE FOLDING MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

MACHINE FOR FOLDING COLLAR-BLANKS AND THE LIKE.

932,769.

Specification of Letters Patent. Patented Aug. 31, 1909.

Application filed November 12, 1903. Serial No. 180,827.

To all whom it may concern:

Be it known that I, WALTER L. DIXON, a citizen of the United States, residing at Boston, in the county of Suffolk, Commonwealth of Massachusetts, have invented an Improvement in Machines for Folding Collar-Blanks and the Like, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

My invention relates to machines for folding the blanks for, that is the members which go to make up, collars, cuffs, and other similar or equivalent articles, preparatory to the assemblage and stitching of the same in and to form the completed article.

While comprehending various improvements in the general construction and operation of a machine for this purpose, my invention relates mainly to means for introducing the blanks and presenting the same to the folding devices, and also to means for automatically removing the folded article or blank from the machine. These permit the operator, after having positioned a blank or blanks in the machine, to take his attention from the machine, leaving it to fold and remove the blanks, while he gives attention to the preparation of further blanks for the next succeeding folding operation; thereby greatly increasing the output as compared with machines which require the operator himself to attend to the removal of the folded blanks or articles from the machine before he can place therein new blanks for the next succeeding folding operation.

The nature of my invention in its various aspects will be best understood from a description of the construction and operation of a machine illustrating one embodiment thereof; it being understood, however, that my invention is in no wise restricted to the particular embodiment selected for this illustration.

In the drawings, Figure 1 is a top or plan view of the bed portion of a machine embodying my improvements, showing part of a blank in position preparatory to folding. Fig. 2 is a longitudinal section on the dotted line 2—2, Fig. 1. Fig. 3 is a cross sectional detail on the dotted line 3—3, Fig. 1, showing the yielding blank support, the die or templet over which the edges are pressed, and the folders in the positions in which they stand at the time of positioning a blank

preparatory to the folding, a blank being shown as upon its support in readiness for the folding. Fig. 4 is a similar sectional detail showing the die or templet dropped upon the blank to hold the latter firmly in position upon its support. Fig. 5, a similar sectional detail showing the die or templet as having further descended, pushing before it the yielding blank carrier or support and as having presented the blank to the edge folders preparatory to the operation of the latter upon the blank. Fig. 6, a similar sectional detail showing the edge folders withdrawn and the folded blank raised above the level of the folders preparatory to its removal from the machine, the infolded and pressed edge being shown slightly open for clearness. Fig. 7 is a top or plan view of the machine as a whole; this view particularly showing the means for contracting the die or templet after the infolding of the edges of the blank and to permit the folded edges to be compressed. Fig. 8 is a front elevation of the machine as a whole, with the frame legs broken off and the nipper mechanism removed. Fig. 9 is a vertical cross section of the parts shown in Fig. 8, the section being taken on the dotted line, 9—9, Fig. 7. Fig. 10 is an end elevation of the machine shown in Figs. 8 and 9, this figure illustrating mainly the driving and shipper mechanisms. Fig. 11 is a detail looking down upon the die or templet carrying cross-head, showing the parts differently positioned as compared with Fig. 7. Fig. 12 is a sectional detail showing manner of adjustment of the rods, 90. Fig. 13, a detail showing the contractible die or templet detached; and Fig. 14, a cross sectional detail of receiving table depressing means.

Similar characters of reference designate corresponding parts in the several figures.

In the particular embodiment of my invention selected for the present illustration, referring particularly to Figs. 1 to 5, inclusive, the blank or article to be folded, here shown as a collar "top" and which may be linen, cotton, or other fabric or material, is positioned upon a depressible support, 10, with its ends overlying fixed supports, 11, which latter are provided with adjustable end stops or guides, 12, by which the blank is centered endwise in the machine. At its rear or inner edge the blank also overlies other portions of the supports, 11, which are

provided thereat with back stops, 13, for positioning the blank laterally in the machine. The fixed supports 11 are as shown non-depressible in contradistinction to the depressible character of the support or platform 10. Said non-depressible portions 11 are not only end supports, (supporting the blank ends while platform 10 supports the blank center) but also have a positioning function as above explained. It should be noted, as seen in Fig. 1, that the non-depressible portions 11 support and position not only the blank ends but somewhat of the blank rear side; whereas as shown said portions 11 do not similarly extend around in the front. On the contrary they terminate in front at the very ends, thus leaving a free or open space in front between the two portions 11; which is useful, as will hereinafter appear, in permitting the folded blanks to be withdrawn forwardly by an outfeeding mechanism, when such outfeeding mechanism is used.

The yielding support, 10, is itself provided with stops, 14, behind which the blank is placed and by which it is prevented from moving away from the back stops, 13. Both the back stops, 13, and front stops, 14, are adjustable in suitable manner, to provide for blanks of different sizes and shapes.

Having been positioned as indicated in Figs. 1 and 3, the contractible templet, 15, is brought down upon and to clamp the blank tightly in position upon its depressible support, 10, as in Fig. 4, after which further descent of the templet depresses the said support and the confined blank to the level shown in Fig. 5, with the projecting edges of the blank resting upon the bed plate, 16, and turned upward against the edges of the folders. The opening in the bed plate, 16, coincides substantially with the outline of the support, 10, as viewed in Fig. 1.

The corner folders, 17, and the back folder, 18, are now advanced to lay the projecting upturned edges of the blank inwardly over and upon the top surface of the templet, after which the said templet is first raised slightly, to clear the blank upon the support and is then contracted and withdrawn forwardly from within the infolded edges, after which the edge folders, 17, 18, and the bed plate, 16, are brought together, for example as shown, by depressing the edge folders, to compress and set the fold, preferably in the presence of heat. This heat may be conveniently provided by making a steam box of the bed, 75, upon which the bed plate, 16, rests and is secured. The edge folders are now raised slightly to free them from the infolded edges of the blank and are withdrawn to permit the depressible support 10 to be raised into its position, Fig. 6, to carry the folded blank above the level of the edge folders, where it is seized by a pair

of nippers, 108—105, Figs. 7 and 9, and withdrawn edgewise from the machine; leaving the yielding support in readiness to receive a new blank for a new folding.

The depressible blank support 10 (see Fig. 9) is mounted upon a central post 20 which is vertically adjustable in a socket 21 in the end of a hook shaped arm 22 loose on the cross-head shaft 23, which latter is mounted in suitable bearings in and at the back of the machine frame, A. This hook shaped arm 22 has a rearwardly extended short lug 24, (Fig. 9) to which is jointed a depending rod 25 which is connected with the rear end of a lever 26, fulcrumed at 27 in the machine frame. The front end of this lever 26 is provided with a roller stud 28, which is operated by a path cam 29 fast on the main shaft 30, the latter journaled in the frame A of the machine. In the present instance, the depression of the blank support 10, under the action of the descending templet, is provided for at the point of connection between the rod 25 and its lever 26, just described. The rear end of this lever 26 is forked, and carries the swinging block 31, through which the lower end of the rod 25 is loosely passed; said rod being provided above said swinging block with one or more lock nuts 32; and below said block the rod is provided with one or more nuts 33, and between the latter and the under side of said lever is interposed a spring 34. Yielding of this spring permits the blank support 10 to be depressed independently of its controlling cam 29, the tension of the spring, however, being sufficient to permit the said cam, through its lever 26, to elevate the blank support to its normal position when the templet is not opposing it.

The templet which descends upon and clamps the blank upon its support 10 consists, in the present embodiment, of two thin plates or members 15^a and 15^b, Fig. 13, having overlapping rear portions whereby they may be moved one toward the other for contracting the templet; or extended one away from the other for expanding the templet in a manner well understood by those skilled in this art.

Referring to Figs. 8, 9 and 13, the two parts 15^a and 15^b of the particular templet shown, are fast upon the under sides of the blocks 35, which are horizontally slotted at their upper edges to receive the screws 36, by which said blocks are adjustably screwed to the depending ribs 37, on the slides 38, carried by the movable cross-head 39, of the machine. The screws 36 and the slots in the blocks 35 permit the said blocks and the templet parts carried thereby to be adjusted toward and away from each other for contracting or enlarging the templet for different sizes of blanks to be pressed.

The templet slides 38 are provided at their

upper sides with the diagonal guides 40, which latter enter corresponding guide-ways in the under side of the cross-head 39. The templet slides 38 also carry two guide screws 41, see Fig. 7, which rise through diagonal slots in the cross-head 39, the direction of said slots corresponding with the direction of the guides 40 previously referred to. The heads of these screws serve to hold the slides up against the under side of the cross-head 39; and the two outermost of said screws 41 also rise through the slide plates 42, which latter are mounted so as to slide lengthwise of the cross-head 39, said sliding plates being slotted from front to rear to receive the shanks of said screws. These two sliding plates 42 are connected by links 43 with diametrically opposite points of the central disk 44, the latter being loosely mounted upon the central stud 45 on the cross-head. In a radial slot 46 of said disk is adjustably clamped the crank pin 47; to which is jointed the connecting rod 48, operated from a slide bar 49. This slide bar is adjustable as to its length, and at its front end has a bearing on the cross-head, while its rear end is forked to straddle the cross-head shaft 23 heretofore referred to. The cross-head shaft 23, see Figs. 7 and 9, also has fast upon it the arms, 50, which reach out to and support at their free ends the cross-head 39 referred to, whereby rocking of the said shaft will cause said cross-head and its attached parts to be swung upwardly or downwardly. This constitutes a convenient means to move the cross-head and templet down and up, toward and from the folding mechanism. The motion of the cross-head shaft and its cross-head is here produced, see Fig. 9, by an arm 51 attached to said shaft, and connected at its rear end, by a link 52, with the free end of the adjustable arm of an elbow lever 53, loose on a shaft 54, said shaft mounted in the machine frame; and said lever 53 has its other arm provided with a roller stud 55, which travels on a surface cam 56, which cam is shown near the left of the machine, Fig. 8, and is fast on the main shaft 30. Thus, rotation of the main shaft acts through cam 56 to swing the cross-head 39 at the proper times, from its elevated dotted position Fig. 3, into the position of Fig. 4, and thereafter into its lowest position, Fig. 5, as required for the folding operation heretofore described.

Referring to Fig. 7, the forked end slide bar 49 has at its side a roller stud 57, see also Fig. 9, which travels in a path cam 58, which is sleeved on the cross-head shaft 23, and is provided with a gear 59 for driving it. This gear 59 is driven by a gear 60, see Fig. 9, on an intermediate shaft 61 mounted in the frame, and gear 60 in turn is driven by a gear 62, Fig. 8, on the main shaft of the machine. Thus, rotation of the main shaft

operates at the proper times through the intermediate gear and the cam 58 referred to, to reciprocate the slide bar 49, Fig. 7, to cause its connecting rod 48 to give a rotary, reciprocatory movement to the disk 44. This causes the said disk, through its connecting links 43, to separate and bring together the slide plates 42 and their connected templet parts, 15^a and 15^b, for the expansion and contraction of the templet. The diagonal guides 40 enforce a diagonal or converging-diverging movement of the two templet parts, so that the said parts move outward or toward the front of the machine simultaneously with their contracting movement or toward the other. This has the effect not only of withdrawing the ends of the templet parts from the end folds of the blank, but also of withdrawing the rear edges of the templet parts from the back folds of the blank.

Folders.—Having described the mounting and movements of the depressible blank support and the construction and mode of operation of the expanding and contracting templet, I will now describe the construction and mode of operation of the folders, 17, 18, Fig. 1. The diagonally movable end-folders, 17, are substantially L-shape and oppositely positioned, so that they will operate around upon the ends and rear corners of the blank. For ordinary corner folding, where the corner is to be rounded, as here shown, these end folders 17 may be moved simultaneously thereby to fold the ends and end portions of the rear of the blank at once. If the corners are to be square, and are required to be locked, as is frequently the case, these folders would be differently constructed and operated, first in one direction and then in another, in a manner well understood by those conversant with the art. Since it is immaterial to my present invention which kind of folders are used, I have selected the simple form shown, namely, for folding round corners; it being understood, however, that my invention is in no wise restricted to the particular construction, form or manner of operation here shown and described.

To produce the simultaneous, diagonal or converging movements of these end folders 17, I have provided them respectively with cross slots 63, which permit them to be moved simultaneously forwardly while being moved inwardly, thereby giving a resultant diagonal movement which is a mean between the two.

Referring to Figs. 1 and 2, the cross slots are shown at 63, one appearing in full lines at the left, Fig. 1, and the other in dotted lines at the right, Fig. 1, and these slots receive the vertical studs 64, fast on the inner ends of the arms 65, see Figs. 7 and 8. These arms are slotted longitudinally to receive

the clamp screws 66, by which said arms are adjustably connected to the blocks 67, which blocks are hinged at 68, in and to the upper ends of the levers 69, fulcrumed at 70 on the frame of the machine, and having their lower ends provided with roller studs 71, which studs travel in the barrel cams 72 fast on opposite ends of the main shaft 30. The hinged blocks are acted upon by springs 73, which tend to press the studs 64, upon the inner ends of the slotted arms 65, into engagement with the longitudinal groove guide 74, provided therefor in the bed 75, of the machine.

Rotation of the main shaft acts through the barrel cams 72 to rock the levers 69, and thereby moves the end folders 17 transversely, or from right to left of the machine. To give these end folders the necessary simultaneous front and back or cross movement, see Figs. 7 and 9, I have provided them with rearwardly extended portions 76, each of which carries a pair of studs 77. These studs 77 rise through long slots 77^a formed in the flange of the folder carrier 78, which latter is in the shape of a long bar or head. This carrier has a pair of rearwardly extended lugs 79, see Fig. 9, which receive the threaded shanks of blocks 80, the latter being slotted at their under sides to receive the pins 81, on the upper ends of arms 82, which arms are fast on the shaft 27 heretofore referred to. This intermediate shaft 27, see Fig. 10, has at its end a depending arm 83, carrying a roller stud 84, which stud travels in a path cam 85, fast on the main shaft 30; whereby rotation of said main shaft will rock said arms 82, and cause the folder carrier 78, to advance and recede simultaneously with the endwise in and out movements of the arms 65, giving to the end folders a resultant diagonal, converging movement, which is the mean between the in and out and advancing and receding movements. During the endwise, in and out movements of these folders 17, the slots 63 permit them also to advance and recede crosswise relatively to their studs 64, and similarly, the long slots 77^a permit the said folders to slide endwise under the movement by the said arms 65, simultaneously with the cross movement described. Since these folders 17 are carried wholly by the folder carrier 78, on which they must also move endwise of the machine, and since the operating parts are all maintained in a heated condition for the better pressing of the folded edge, it is desirable to provide efficient devices which will permit free movement of the folders, notwithstanding the heated condition of the parts, which forbids the use of a lubricant. For this purpose, see Fig. 9, the under side of the carrier head 78 is slotted lengthwise to receive a series of roller studs 85^a, mounted upon the top faces of the

folders, and which rollers preserve the alignment of the said folders from front to rear of the machine without the use of a lubricant. Said folders are also provided with elbow arms 86, which reach upward at the rear of the folder head 78, and are there provided with roller studs 87, which latter travel in a horizontal trackway in the rear edge of the said folder head and which serve to support the said folders and to hold them at the proper level, while permitting free sliding movements thereof, also without the use of lubricant.

Referring now to Fig. 1, the back folder 18 is clamped by screws 88 to the folder carrier 78, and is adjustable longitudinally thereon in the slots 77^a thereof, referred to. This middle back folder 18 has no endwise movement; merely an advancing and receding movement over the rear edge of the blank.

The slots in the folder moving arms 65, at the ends of the machine, permit the end folders to be adjusted toward and from each other for different lengths of blanks; and a back folder 18, of greater or less length, may be used as required to fill in the space between the end folders when they are in their closed positions one relative to the other.

Having described the means for manipulating the folders to lay the edges of the blank over and upon the templet together with the means for collapsing or contracting and withdrawing the templet from the infolded edges, I will now describe the means for compressing or setting the folded edges. As heretofore stated, this is accomplished by pressing the folders and the bed plate one toward the other. In the present instance, the folders are pressed downward toward the bed plate.

Referring to Figs. 1, 7 and 10, the folder carrying head 78, near its end, is notched or raised at its front edge to receive the pivoted blocks 89, through which are passed the upper, threaded ends of the presser rods 90. To provide for convenient adjustment of the ends of these rods 90, in the said pivoted blocks, the threaded ends of the said rods, see Fig. 12, are screwed into the internally threaded shanks 91 of nuts 92, which shanks extend down through said blocks for the purpose. Lock nuts 93 are screwed upon the lower ends of the said shanks at the under side of the pivoted blocks and other lock nuts, 93, are screwed upon the ends of the rod above the shank nuts 92. Thus, by slackening the lock nuts and turning the shank nuts 92, the ends of the rods may be adjusted in and relative to the pivoted blocks without turning the rods themselves. These rods 90, see Figs. 8 and 10, are suitably attached at their lower ends to the ends of a yoke 94, hung on the shaft

54 and provided with a forwardly and upwardly extending arm 95, which arm is provided with a roller stud operated by a path cam 96 fast on main shaft 30.

5 In the operation of the machine, after the templet pushing before it the yielding blank support and the confined blank, has descended into the position shown in Fig. 5, the cam 96, last mentioned, operates through
10 the rods 90, just described, to lift the folder carrier 78 slightly, thereby to lift the folders 17, 18, so that they will clear or allow for the thickness of the templet in the folding of the edges of the blank over the templet.
15 After having folded the edges of the blank inwardly over and upon the templet, they are further lifted slightly by the cam 96 to permit ready withdrawal of the collapsing or contracting templet; after which
20 the said cam acts through the said rods 90 to pull down upon or depress the folder carrier 78, and its folders 17, 18, to cause the latter sharply to crease or set the infolded edges of the blank in the presence of heat.
25 The folders are held in their depressed or setting positions for the desired time, determined by the cam 96; after which they are released by the said cam, and raised free and clear of the now folded blank, leaving
30 the latter free to be withdrawn by the outfeeding devices or nippers, which I will now describe.

Outfeeding devices.—Referring to Fig. 9, there is mounted in and at the front of the
35 end frames A, a shaft 97, upon which, near its middle, is loosely mounted the hub of a carrier arm 98, said hub having an inwardly extended lug 99 which carries a pin 100. This pin engages the forked end of a lever 101,
40 which is fulcrumed at the rear of the machine upon the shaft 54, and is provided intermediate its length with a roller stud 101^a, which stud travels in a path cam 102, see Fig. 8, on the main shaft 30, so that rotation
45 of the main shaft at the proper times, determined by said cam lever 101, swings the said carrier arm 98 toward and away from the blank being folded in the machine. The carrier arm 98, at its upper end, see Fig. 7,
50 is forked to provide bearings for the ends of the short shaft 103. Upon this shaft and between the said bearings are fixedly secured the finger supports 104 to which are rigidly secured the under fingers, 105.

55 Pivoted to the finger supports at 106 are the top finger carriers 107, to which are connected the top fingers 108, said top finger carriers having rearwardly extended arms 109, which are connected by a rod 110; whereby
60 said carriers and their respective top fingers may be swung about the pivots 106 to give to the said top fingers opening and closing or releasing and nipping movements relative to the under fingers 105. To produce these
65 opening and closing movements I have pro-

vided a small table 111, upon which the rod 110 is pressed by a spring 112, and this table 111 is mounted upon the upper end of a rod 113, the lower end of which rests upon the arc shaped end of a cam lever 114, said
70 lever being fulcrumed upon the shaft 61 previously referred to, and said cam lever having intermediate its length a roller stud 115 which travels on a surface cam 116 on the main shaft 30, between the cams 96 and 102.
75

The spring 112 which presses the rod 110 upon the table 111, acts also to maintain the table carrying rod 113 down in operative engagement with the arc shaped cam lever 114; so that at the proper times the cam 116, just
80 described, by dropping the arc-shaped end of its lever, will permit the lower end of the rod 113, in whatever radial position the lever may be, also to drop and, by dropping the rod 110, cause the top nippers 108 to be raised
85 or opened into their dotted positions, Fig. 9. Conversely when the said cam lever, 114, is raised by its cam it will act through the rod 113, in whatever position the latter may be, to raise the rod 110, and close the top nip-
90 pers 108, upon the bottom nippers 105.

The nippers, whether closed or open, may be raised or lowered, to bring them to the required levels for seizing and releasing the folded blanks, by rocking the shaft 103, upon
95 which they are mounted; and for this purpose I have provided the said shaft with a collar having an arm 117, to which is connected a spring 118, attached also to the carrier arm 98; said collar being provided at its
100 opposite side with a stop arm 119, which moves relatively to one or more stop nuts 120 on the stop rod 121, which rod projects laterally from said arm 98. While the spring 118 tends normally to hold the nippers in their
105 depressed or lowermost positions, the cam lever 114, if raised, will act through its rod 113, and the table 111 upon the rod 110, to lift the closed nippers against the action of the said spring 118, the lifting action
110 tending also to maintain the nippers tightly closed during the lifting movement. Thus, the nippers are raised and lowered under the control of the cam lever 114, and are also opened and closed under the control of said
115 lever, the stop arm 119 and nut or nuts 120 serving to fix the possible lowest position of the nippers, whether open or closed.

In the operation of the machine at or about the time when the folders are de-
120 pressed to set or compress the folded edges of the blank, the nipper carrying arm 98 is caused by its cam 102 to advance toward the blank, and, as it advances, the cam lever 114 is dropped by its cam 116 to cause
125 the said nippers to open, as shown in dotted lines, Fig. 9.

By the time the folders have completed the setting of the folded edge and been withdrawn, and the yielding support 10 raised to 130

its original position, carrying the folded blank upon it, the open nippers reach the front edge of said yielding support, the bottom nippers entering under and the top nippers passing over the blank which rests upon the said support. The support is notched at 122 to clear the nippers, so that when they seize the blank they will not seize also the support upon which the blank rests. Having reached their innermost positions shown in dotted lines Fig. 9, the cam lever 114 is raised by its cam, and through rod 110 closes the nippers, causing them to seize the folded blank, after which further lifting movement of the rod 110, by the said cam lever, being unable further to close the said nippers, acts to lift the closed nippers bodily and sufficiently to raise the front edge of the folded blank clear of the front and end positioning stops 14 and 12, Fig. 1. The nipper carrier arm 98 is now moved, by its cam, away from the bed of the machine, carrying with it the folded blank, and leaving the depressible support 10 ready for a new blank to be placed immediately thereon for a new folding operation.

As the nippers carrying the folded blank move outwardly away from the bed, they are at the same time also opened and lowered by the cam lever 114, to deposit the folded blank upon the table 123, or upon the pile of folded blanks thereon. The folded blank is deposited between four upright posts 124, which are mounted on the fixed shelf 123^a, and rise above said table so that withdrawal of the under nippers from beneath the folded blank in the further outward movement of the nipper carrier 98 will not disturb the pile of blanks upon the said table, nor displace the blank about to be deposited on the said table. It is clear that the level of the table 123 must be gradually lowered, as the pile of folded blanks is built up thereon, in order that the topmost blank of the pile may always be deposited at substantially the same level, whether there be one or more folded blanks in the pile. To accomplish this, referring to Fig. 8, I have removably mounted the said table 123 upon a rotatable post 125, in which post is cut a spiral groove 126 of high pitch. This spirally grooved post drops through the shelf 123^a, and to the under side of said shelf is pivoted at 124^a an L-shaped lever 125^a, see Fig. 14, one end of which enters the spiral groove 126, it being retained therein by a spring 127. Immediately below the lever 125^a is a collar 128 loosely surrounding the grooved post 125 and provided with a feather 128^a, which feather enters a longitudinal groove in the said post; so that rotation of the said collar will cause corresponding rotation of the spirally grooved post and will cause it to be screwed upward or downward according to the direction of

rotation while maintaining a sliding engagement between its feather and groove referred to. For rotating this collar 128 I have provided the same with fine ratchet teeth 129, which are engaged by a spring pressed pawl 130, on a rod 131, said rod mounted to slide longitudinally in bearings 132, Fig. 8. This rod is pressed by a spring 133 against the free end of a depending arm 134 on the shaft 70, which shaft carries the arm that reciprocates one of the end folders, so that at each outward movement of the end folders, the rod 131 is moved inward, and, through its pawl referred to, rotates the collar 128, and thereby causes the table to be slightly lowered to compensate for the increased depth of the pile of folded blanks thereon due to the addition of the topmost blank thereto.

The number of teeth engaged by the pawl at each reciprocation of the rod 131, and the consequent rotative movement of the collar and lowering of the table, may be determined by suitable means, as, for instance, by an adjusting screw 135 in the lower end of the arm 134, which screw abuts against and moves rod 131, and whose adjustment therefore determines how far said rod will vibrate and therefore how many teeth the pawl 130 will pass over in each vibration. To assist this a pin 131^a may be provided on the rod 131, which pin abuts against the bearing 132 at the left, and serves as a check to the backward movement of the bar 131, thus causing a lost motion between the rod 131 and screw 135, which lost motion is rendered variable by the adjustment of screw 135.

After having folded a given number of blanks representing a given lot or lots of the same, they may be removed from the table and to facilitate quick return of the table to its normal elevated position preparatory to the placing thereon of a new lot, the operator may withdraw the spring controlled lever 125^a from engagement with the spiral groove of the post 125, and may then slide the said post upwardly past the said lever, and thereby at a single movement restore the table with its pile of blanks to elevated position; after which he may permit the said lever again to engage the said spiral groove for the control of the next descent of the said table.

The positioning posts 124 are adjustable in the stationary shelf 123^a, which is slotted to permit them to be moved toward and away from each other to accommodate different widths of blanks; they being held in adjusted positions by thumb nuts 136.

After the table carrying the pile of folded blanks has been elevated as described, the table may be lifted from its position and clear of the upright guide posts 124, and placed upon any shelf or place conveniently

at hand; said table being provided with suitable legs 137 for its support.

To maintain intact the pile of folded blanks upon table 123 during or after the removal of said table from the machine and from between the stationary guide posts 124, any suitable means may be employed, and, if desired, a plurality of such tables may be used so that while one pile of blanks is being removed and tied up into a bundle, another such table may be inserted to receive a new pile of folded blanks.

The depressible support 10, of minimum size, will ordinarily suffice for the larger sizes of blanks to be folded thereon, because in every case the edges and ends of the blanks are supported upon the end supports 11, which are made longitudinally adjustable, see Fig. 8, by means of set screws 160 passing through slots 161 therein.

My invention, however, comprehends the use of depressible tables of different or variable sizes, whenever it is found desirable to use the same.

Turning now to Figs. 8 and 10, the main shaft 30, has mounted upon its end a worm wheel 170, in mesh with and driven by a worm 171 on a cross shaft 172, said cross shaft journaled in bearings 173 in the frame. This cross shaft carries fast and loose pulleys 174 and 175, suitable shipper mechanism being employed for shifting the driving belt from one to another of said pulleys. In the present embodiment of my invention this shipper comprises the parallel arms 175^a, between which the belt is passed, said arms being mounted on a shipper bar 176, which in turn is mounted to slide in suitable bearings in the frame. A spring 177 is interposed between one of said bearings and a loose collar 178^a, seated against a fast collar 178 on said shaft, and tends to throw the said shipper normally over to the loose pulley. The shipper bar is moved to the right, Fig. 10, upon the fast pulley and in opposition to said spring, by the arm 179 of a rocking treadle 180, pivotally mounted at 181 in a suitable bracket or support. Rocking of the treadle throws the arm to the right, Fig. 10, and places the shipper opposite the fast pulley, where it may be held by continued depression of the treadle to produce continuous operation of the machine; requiring the operator to feed the blanks to it while the machine is in motion. To stop the machine at the end of each cycle of movements or after the fold of each blank, when the treadle is not maintained continuously depressed, I have provided upon the shaft 61, Fig. 10, a shipper cam 182, coöperating with which is a lever 183, fulcrumed at 184, and connected at its lower end, by a link 185, with the loose collar 178^a. Assuming the treadle to have been rocked in the direction of the arrow shown, Fig. 10, and the shipper bar moved

to the right, as the machine starts, the end of the lever 183, mounts upon the largest diameter of the shipper cam 182, and if the treadle be released, the said cam will still hold the said lever 183 in its outermost position, with the shipper opposite the fast pulley, until the completion of the folding of a blank or set of blanks. If the treadle be not still depressed, the end of the said lever 183 will then drop into the V-shaped depression in the shipper cam, and permit the spring 177 to return the shipper bar to the left, Fig. 10, and throw the belt upon the loose pulley, 175.

It is occasionally necessary to turn the machine by hand, either forward or backward, and for this purpose the end of the worm shaft 172 is squared, see Fig. 8, to receive a crank handle by which it may be rotated and the machine operated. Should the machine, however, be turned in either direction by hand, a sufficient distance to raise the cam roll of lever 183 out of the V-shaped depression in the shipper cam, said lever would throw the belt upon the fast pulley and snatch the machine from the control of the operator with possible damage that might result therefrom. To obviate this, I have provided, see Fig. 10, a swinging lock, having a projection 191 which, before the machine is operated by hand, is dropped behind the hub of arm 179, on the end of the shipper bar, which has been first moved into its position to carry the belt upon the loose pulley. This holds the said bar against any movement which could carry the belt upon the fast pulley during such time as the machine is being operated by hand, and the belt cannot be shifted until the lock is positively disengaged prior to restoring the machine to power operation.

Referring to Fig. 10, I have provided the shaft 23 with a rearwardly extended stop arm 200. When the arms 50, carrying the templet, are thrown over toward the back of the machine about the axis of the shaft 23, this stop arm 200 contacts with the shaft 61 to limit the swinging movement of the said arms 50, and supports the same until restored to normal position.

The above described machine, it will have been seen, is a creasing as well as folding machine, since the folds are pressed and creased before the blank comes out of the machine; the bed on which the blanks rest while being folded may be termed a table; the blank edges extending beyond the templet may be termed flaps, which flaps are folded onto the body of the blank; the support 10 and its actuating mechanism constitute means for automatically raising the fabric-body off the table; the grasping fingers 105, 108 of the out-feeding mechanism, may be termed clamping jaws, and these may be said to be mounted to move with a partial revolution about the horizontal shaft

97 until they can engage the raised fabric blank, when the jaws are closed, as described, to clamp the fabric blank, and they then move back and carry it to the front side of the machine, when the jaws open and drop the blank.

I have herein described my invention in the best embodiment thereof which I have thus far developed; obviously, however, my invention is not limited to the particular embodiment here shown and described, but may be widely varied and adapted within the spirit and scope of the invention, forming the subject matter of the following claims.

What I claim and desire to secure by Letters Patent is:

1. In a creasing and folding machine, a table for supporting the fabric, a collapsible former for holding the fabric on the table, folders for folding the fabric over the former, means for collapsing the former to withdraw it from beneath the folders, means for pressing the folders downward upon the folded edges of the fabric, means for raising the fabric from the table, means for grasping and removing the fabric from the raising means, and means for operating the parts in sequence and in the order named.

2. A creasing and folding machine provided with a table, means for forming flaps and folding the same onto the fabric-body resting on the table, means for automatically raising the fabric-body off the table, and means for automatically grasping and removing the raised finished fabric from the raising means.

3. In a machine for folding blanks for collars or analogous articles, the combination of folding means, a yieldingly mounted platform on which blanks may be laid when in elevated position, and which may be pushed down against the yielding resistance to carry the blanks to folding position, an elastic device to cause such yielding resistance, a templet adapted to define the blanks during folding and to disengage therefrom after folding, and mechanism, other than the device for causing yielding resistance, adapted to raise said platform and thereby elevate the folded blanks to where they may be extracted preparatory to the operations on a succeeding blank.

4. In a machine for folding blanks for collars or analogous articles, the combination of folding means, a yieldingly mounted platform on which blanks may be laid when in elevated position, and which may be pushed down against the yielding resistance to carry the blanks to folding position, an elastic device to cause such yielding resistance, a templet adapted to define the blanks during folding and to disengage therefrom after folding, mechanism, other than the device for causing yielding resistance, adapted

to raise said platform and thereby elevate the folded blanks to where they may be extracted preparatory to the operations on a succeeding blank, and means to crease the blank folds after such disengagement of the templet but before the rising of said platform.

5. In a machine for folding blanks for collars or analogous articles, a platform movable upwardly and downwardly, mechanical connections with said platform for actuating it to move upwardly and downwardly, and an elastic device acting through said connections for allowing a yielding of said platform, whereby the fabric may be laid on said platform and pushed downwardly therewith to folding position; combined with a templet for defining the blanks during folding, said templet adapted to be extricated from the folds and withdrawn before the said platform is moved upward, and infolders for folding the fabric edges while defined by said templet and before the platform rises for the removal of the folded blanks and the receipt of unfolded ones.

6. In a machine for folding blanks for collars or analogous articles, a platform movable upwardly and downwardly, mechanical connections with said platform for actuating it to move upwardly and downwardly, and an elastic device acting through said connections for allowing a yielding of said platform, whereby the fabric may be laid on said platform and pushed downwardly therewith to folding position; combined with a templet for defining the blanks during folding, said templet adapted to be extricated from the folds and withdrawn before the said platform is moved upward, infolders for folding the fabric edges while defined by said templet and before the platform rises for the removal of the folded blanks and the receipt of unfolded ones, and pressing means for creasing the folds while in infolding position after the extraction of the templet therefrom.

7. In a machine for folding blanks for collars or analogous articles, a platform movable upwardly and downwardly, mechanical connections with said platform for actuating it to move upwardly and downwardly, and an elastic device acting through said connections for allowing a yielding of said platform, whereby the fabric may be laid on said platform and pushed downwardly therewith to folding position; combined with a templet for defining the folds in the blanks and means to operate said templet to push the fabric and platform down to folding position, said templet adapted to be extricated from the folds and withdrawn before the said platform is moved upward, and infolders for folding the fabric edges while defined by said templet and before the platform rises for the re-

moval of the folded blanks and the receipt of unfolded ones.

8. In a machine for folding blanks for collars or analogous articles, a platform movable upwardly and downwardly, mechanical connections with said platform for actuating it to move upwardly and downwardly, and an elastic device acting through said connections for allowing a yielding of said platform, whereby the fabric may be laid on said platform and pushed downwardly therewith to folding position; combined with a templet for defining the folds in the blanks and means to operate said templet to push the fabric and platform down to folding position, said templet adapted to be extricated from the folds and withdrawn before the said platform is moved upward, infolders for folding the fabric edges while defined by said templet and before the platform rises for the removal of the folded blanks and the receipt of unfolded ones, and pressing means for creasing the folds while in infolding position after the extraction of the templet therefrom.

9. In a machine for folding blanks for collars or analogous articles, the combination with folding means of a blank supporting platform on which blanks may be laid, mechanism for moving the same upwardly and downwardly, the said platform normally held yieldingly in its elevated or blank supplying position, an expanding and contracting templet, means for causing said templet to depress said platform into a non-yielding blank-folding position, means for contracting said templet, while in such position and after the folds have been formed, and pressure mechanism for squeezing the folds beneath the folding means after the templet is contracted.

10. In a machine for folding blanks for collars or analogous articles, the combination with movable folding devices, of an upwardly and downwardly movable blank platform, against which blanks are held by the templet which defines the edges thereof during infolding, means whereby said platform may be held stationary while in its downward position, during the operation of the folding devices, mechanism for moving said platform and folded blanks upward from folding position to an elevated position whence blanks are removed or inserted, an upwardly and downwardly movable templet, a swinging mechanism for positioning the said templet upon the blanks, and a swinging mechanism for controlling the path of movement of the blank-platform, whereby the latter may move in an arc about substantially the same axis as said templet.

11. In a machine for folding blanks for collars or analogous articles, the combination with a templet for defining the blanks, and

a folding mechanism, of a blank supporting platform of a size slightly smaller than the blanks and upon which blanks may be laid, and are directly supported during the folding operations of said folding mechanism, said platform forming part of the machine and having mechanism for moving it between an elevated receiving position at which unfolded blanks may be placed directly upon it and a depressed or folding position, outfeeding mechanism for engaging a folded blank and removing it from said platform while in elevated position, and automatic mechanism timed to effect the folding of the blank and subsequently the withdrawal of the templet from the folds and the elevation of the platform, and subsequently the operation of said outfeeding mechanism.

12. In a machine for folding blanks for collars or analogous articles, the combination of folding means, a yieldingly mounted platform on which blanks may be laid when in elevated position, and which may be pushed down against the yielding resistance to carry the blanks to folding position, an elastic device to cause such yielding resistance, a templet adapted to define the blanks during folding and to disengage therefrom after folding, mechanism, other than the device for causing yielding resistance, adapted to raise said platform and thereby elevate the folded blanks to where they may be extracted preparatory to the operations on a succeeding blank, and outfeeding mechanism adapted to seize a folded blank upon said platform after the latter has returned to elevated position.

13. In a machine for folding blanks for collars or analogous articles, a platform upon which blanks may be laid, said platform being of a size slightly smaller than the blanks and fitted to be movable upwardly and downwardly, mechanical connections with said platform for moving it upwardly and downwardly, combined with a templet for defining the folds in the blanks and means for operating said templet to push the fabric and platform down to folding position, said templet adapted to be extricated from the folds and withdrawn before the said platform is moved upward, infolders for folding the fabric edges while defined by said templet and before the platform rises for the removal of the folded blanks and the receipt of unfolded ones, and outfeeding mechanism adapted to seize a folded blank upon said platform after the latter has returned to elevated position.

14. In a folding machine having a swinging templet and movable folding mechanism, a movable blank platform against which blanks are held fixedly by said templet during the infolding thereof, said platform having a stationary horizontal position during the folding operation of the folding mech-

anism, said platform mounted upon an arm fitted to swing about the same axis as the swinging templet for swinging said platform into and out of folding position, means for holding said platform stationary during the folding operation of said folding mechanism, and means for elevating said platform with the folded blank lying thereon, from the position occupied during folding operation, to where the blank is removed.

15. In a machine for folding blanks for collars or analogous articles, the combination with folding devices and the movable blank supporting platform having an outline slightly smaller than that of the blanks, of an expansible and contractible templet adapted to depress the platform to the level where folding may be accomplished, automatic means to return said platform to a substantially elevated position from whence the folded blank may be removed mechanically, and powerful positive pressing means acting after the templet is contracted but before the platform is elevated.

16. In a machine for folding blanks for collars or analogous articles, the combination with templet and folding means of a blank supporting means independent thereof and comprising a depressible platform portion upon which the operator can place fabric pieces, and elevated non-depressible portions within which the templet can pass to carry the blanks and depressible portion to the folding mechanism, positioning devices on said depressible portions, and blank out-feeding mechanism cooperating with said depressible portions, the said depressible portions adapted to substantially elevate the folded blanks for cooperation with out-feeding mechanism, all combined substantially in the manner and for the purposes set forth.

17. In a machine for folding blanks for collars or analogous articles, the combination with folding means of blank supporting means independent thereof and comprising depressible and elevated non-depressible portions and positioning devices on said non-depressible portions, and blank out-feeding mechanism cooperating with said depressible portions, the said depressible portions adapted to substantially elevate the folded blanks for cooperation with out-feeding mechanism, all combined substantially in the manner and for the purposes set forth.

18. In a machine for folding blanks for collars or analogous articles, the combination with a templet and cooperating folding, supporting and setting means, of automatic out-feeding nippers and means for operating the same to seize a folded blank on said supporting means and drawing the same therefrom, all combined substantially in the manner and for the purposes set forth.

19. In a machine for folding blanks for

collars or analogous articles, the combination with folding means of blank supporting means and outfeeding means comprising nippers to engage the folded blank within the edge thereof while resting on said supporting means, all combined substantially in the manner and for the purposes set forth.

20. In a machine for folding blanks for collars or analogous articles, the combination with folding means of a depressible recessed blank support normally above said folding means and outfeeding means comprising seizing fingers or nippers which operate in said recesses upon elevation of said support to engage a folded blank on said support, all combined substantially in the manner and for the purposes set forth.

21. In a machine for folding blanks for collars or analogous articles, the combination of folding means with blank supporting means and outfeeding means comprising automatically operating nippers and means to change the level thereof, all combined substantially in the manner and for the purposes set forth.

22. In a machine for folding blanks for collars or analogous articles, the combination of folding means with blank supporting means and outfeeding means comprising automatically operating nippers and means to raise said nippers after having seized the folded blank and for depressing the same for deposit of said blank, all combined substantially in the manner and for the purposes set forth.

23. In a machine for folding blanks for collars or analogous articles the combination of a normally elevated depressible blank receiving support, a templet fitted to contact the blanks upon said support while in depressed position, infolders for folding edge portions of the blanks over edge portions of the templet while said support is in depressed position, means for elevating said support to blank receiving position, and seizing mechanism comprising cooperating fingers movable to and from said support while in its elevated position adapted to seize a folded blank upon said support and remove the same to a suitable receptacle, and said receptacle.

24. In a machine for folding blanks for collars or analogous articles the combination of a normally elevated depressible blank receiving support, a templet fitted to contact the blanks upon said support while in depressed position, infolders for folding edge portions of the blanks over edge portions of the templet while said support is in depressed position, means for elevating said support to blank receiving position, and seizing mechanism movable to and from said support while in its elevated position adapted to seize a folded blank upon said support and remove the same to a suitable receptacle,

and said receptacle; said seizing mechanism comprising a swinging member, fingers pivotally mounted, and means for actuating said fingers in cooperation with each other.

25. In a machine for folding blanks for collars or analogous articles the combination of a normally elevated depressible blank receiving support, a templet fitted to contact the blanks upon said support while in depressed position, infolders for folding edge portions of the blanks over edge portions of the templet while said support is in depressed position, means for elevating said support to blank receiving position, and seizing mechanism comprising cooperating fingers movable to and from said support while in its elevated position adapted to seize a folded blank upon said support and remove the same to a suitable receptacle, and said receptacle; and a power shaft having operative connections for actuating said machine, and timed to lower said templet upon the blanks, and afterward to effect the folding movements of said infolders, to then bring about the elevation of said support, and then the operation of said seizing mechanism, substantially as described.

26. In a machine for folding blanks for collars or analogous articles the combination of a normally elevated depressible blank receiving support, a templet fitted to contact the blanks upon said support while in depressed position, infolders for folding edge portions of the blanks over edge portions of the templet while said support is in depressed position, means for elevating said support to blank receiving position, and seizing mechanism movable to and from said support while in its elevated position adapted to seize a folded blank upon said support and remove the same to a suitable receptacle, and said receptacle; said seizing mechanism comprising a swinging member, fingers pivotally mounted, and means for actuating said fingers in cooperation with each other and a power shaft having operative connections for actuating said machine, and timed to lower said templet upon the blanks, and afterward to effect the folding movements of said infolders, to then bring about the elevation of said support, and then the operation of said seizing mechanism, substantially as described.

27. In a folding machine, a blank supporting platform accessible to the operator and adapted to receive and support in a flat condition a piece of fabric laid directly thereon by the operator, suitable gages being provided to insure the accurate positioning of the blank, said platform having fittings and with its fittings forming a permanent element of the machine, said fittings being such as to permit movement of said platform from blank receiving position downwardly, carrying the fabric with it, to a

folding mechanism, said folding mechanism, means cooperating with said fittings for lifting the platform and the folded blank thereon, to normal elevated position, and automatic blank seizing and outfeeding mechanism cooperating with the support in its elevated position.

28. In a folding machine, a blank supporting platform accessible to the operator and adapted to receive and support in a flat condition a piece of fabric laid directly thereon by the operator, suitable gages being provided to insure the accurate positioning of the blank, said platform having fittings and with its fittings forming a permanent element of the machine, said fittings being such as to permit movement of said platform from blank receiving position downwardly, carrying the fabric with it, to a folding mechanism, a yieldingly resisting element comprised in said fittings, a part for pushing the fabric pieces and said platform downwardly against the resistance thereof, said folding mechanism, and means cooperating with said fittings for lifting the platform and the folded blank thereon, to normal elevated position.

29. In a folding machine a blank supporting platform accessible to the operator and adapted to receive and support in a flat condition a piece of fabric laid directly thereon by the operator, suitable gages being provided to insure the accurate positioning of the blank, said platform having fittings and with its fittings forming a permanent element of the machine, said fittings being such as to permit movement of said platform from blank receiving position downwardly, carrying the fabric with it, to a folding mechanism, a yieldingly resisting element comprised in said fittings, a part for pushing the fabric pieces and said platform downwardly against the resistance thereof, said folding mechanism, means cooperating with said fittings for lifting the platform and the folded blank thereon, to normal elevated position, and automatic blank seizing and outfeeding mechanism cooperating with the platform in its elevated position.

30. In a folding machine, a blank supporting platform accessible to the operator and adapted to receive and support in a flat condition a piece of fabric laid directly thereon by the operator, suitable gages being provided to insure the accurate positioning of the blank, said platform having fittings and with its fittings forming a permanent element of the machine, said fittings being such as to permit movement of said platform from blank receiving position downwardly, carrying the fabric with it, to a folding mechanism, a yieldingly resisting element comprised in said fittings, a templet for defining the folds in the blanks during infolding and adapted also to descend and

push the fabric pieces and said platform downwardly against the resistance of said resisting element, said folding mechanism, and means cooperating with said fittings for lifting the platform and the folded blank thereon, to normal elevated position.

31. In a folding machine, a blank supporting platform accessible to the operator and adapted to receive and support in a flat condition a piece of fabric laid directly thereon by the operator, suitable gages being provided to insure the accurate positioning of the blank, said platform having fittings and with its fittings forming a permanent element of the machine, said fittings being such as to permit movement of said platform from blank receiving position downwardly, carrying the fabric with it, to a folding mechanism, a yieldingly resisting element comprised in said fittings, a templet adapted to define the folds in the blanks during infolding and disengage therefrom after folding, means for causing the templet to descend and push the unfolded fabric pieces and said platform downwardly against the resistance thereof, said folding mechanism, means cooperating with said fittings for lifting the platform and the folded blank thereon, to normal elevated position, and automatic blank seizing and outfeeding mechanism cooperating with the platform in its elevated position.

32. In a folding machine, a blank supporting platform accessible to the operator and adapted to receive and support in a flat condition a piece of fabric laid directly thereon by the operator, stationary gages being provided independent of and located outwardly of the platform to insure the accurate positioning of the blank, said platform having fittings and with its fittings forming a permanent element of the machine, said fittings being such as to permit movement of said platform from blank receiving position downwardly, carrying the fabric with it, to a folding mechanism, a yieldingly resisting element comprised in said fittings, a part for pushing the fabric pieces and said platform downwardly against the resistance thereof, said folding mechanism, and means cooperating with said fittings for lifting the platform and the folded blank thereon, to normal elevated position.

33. In a folding machine, a blank supporting platform accessible to the operator and adapted to receive and support in a flat condition a piece of fabric laid directly thereon by the operator, stationary gages being provided independent of and located outwardly of the platform to insure the accurate positioning of the blank, said platform having fittings and with its fittings forming a permanent element of the machine, said fittings being such as to permit movement of said platform from blank re-

ceiving position downwardly, carrying the fabric with it, to a folding mechanism, a yieldingly resisting element comprised in said fittings, a templet for defining the folds in the blanks during infolding and adapted also to descend and push the fabric pieces and said platform downwardly against the resistance thereof, said folding mechanism, and means cooperating with said fittings for lifting the platform and the folded blank thereon, to normal elevated position.

34. In a folding machine, the combination of a bed, infolding mechanism, elevated non-depressible portions fixedly connected as a permanent part of the machine, located to embrace the path of the blank transferring means hereinbelow recited, and upon which a piece of fabric may be directly laid and positioned above said infolding mechanism, and means for transferring the blanks from said non-depressible portions to the bed to be folded.

35. In a folding machine, the combination of a bed, infolding mechanism, a templet adapted to move toward and from said bed, and elevated non-depressible portions fixedly connected as a permanent part of the machine over which an unfolded blank may be preliminarily positioned and located to embrace the path of said templet movement.

36. In a folding machine, the combination of a bed, infolding mechanism, elevated non-depressible portions fixedly connected as a permanent part of the machine, located to embrace the path of the blank transferring means hereinbelow recited, and upon which a piece of fabric may be directly laid and positioned above said infolding mechanism, and means, comprising a platform depressible toward said bed, for transferring the blanks from said non-depressible portions to the bed to be folded.

37. In a folding machine, the combination of a bed, infolding mechanism, a templet adapted to move toward and from said bed, elevated non-depressible portions fixedly connected as a permanent part of the machine over which an unfolded blank may be preliminarily positioned, and located to embrace the path of said templet movement; and a platform depressible by said templet toward said bed whereby said templet and platform may carry the blanks from the elevation of said non-depressible portions to that of the bed.

38. In a folding machine, the combination of a bed, infolding mechanism, a templet adapted to move toward and from said bed and having means for extracting it from a folded blank, elevated non-depressible portions over which an unfolded blank may be preliminarily positioned, and located to embrace the path of said templet movement; a platform depressible by said templet toward said bed whereby said templet and platform

may carry the blanks from the elevation of said non-depressible portions to that of the bed, and means for again elevating said depressible platform with the folded blank thereon whereby the folded blank may be easily removed.

39. In a folding machine, the combination of a bed, infolding mechanism, a templet adapted to move toward and from said bed and having means for extracting it from a folded blank, elevated non-depressible portions over which an unfolded blank may be preliminarily positioned, and located to embrace the path of said templet movement; a platform depressible by said templet toward said bed whereby said templet and platform may carry the blanks from the elevation of said non-depressible portions to that of the bed, and means for reelevating said depressible platform with the folded blank thereon to the same elevation with said non-depressible portions, whereby the folded blank may be easily removed.

40. In a folding machine, the combination of a bed, infolding mechanism, a templet adapted to move toward and from said bed, elevated non-depressible portions over which an unfolded blank may be preliminarily positioned, and located to embrace the path of said templet movement; a platform depressible by said templet toward said bed whereby said templet and platform may carry the blanks from the elevation of said non-depressible portions to that of the bed, means for again elevating said depressible platform with the folded blank thereon, and outfeeding mechanism cooperating with said platform when elevated for removing the folded blank therefrom.

41. In a folding machine, the combination of a bed, infolding mechanism, a templet adapted to move toward and from said bed, elevated non-depressible portions over which an unfolded blank may be preliminarily positioned, and located to embrace the path of said templet movement; a platform depressible by said templet toward said bed whereby said templet and platform may carry the blanks from the elevation of said non-depressible portions to that of the bed, means for again elevating said depressible platform with the folded blank thereon, to the same elevation with said non-depressible portions, and outfeeding mechanism cooperating with said platform when elevated for removing the folded blank therefrom; said non-depressible portions formed with a free open space in front to permit the outfeeding operation.

42. In a folding machine the combination of infolding mechanism for infolding edge portions of fabric blanks for collars and like articles, and outfeeding mechanism, the latter comprising a grasping device, together with actuating means for moving said de-

vice bodily inward and outward and for also bodily raising and lowering it, whereby the blank may be raised when grasped, so that when drawn forward it will clear objects in front of it.

43. In a folding machine the combination of elevated non-depressible portions over which an unfolded blank may be preliminarily positioned and having gages to facilitate such positioning, infolding mechanism for infolding edge portions of fabric blanks for collars and like articles, means for transferring a blank from said non-depressible portion to said infolding mechanism and for raising it again after folding, and outfeeding mechanism comprising a grasping device, together with actuating means for moving said device bodily inward and outward and for also bodily raising and lowering it whereby the blank may be raised when grasped so that when drawn forward, it will clear said non-depressible portion and the gages thereon.

44. In a folding machine, the combination of mechanism for infolding the edge portions of fabric blanks for collars and like articles, a support for supporting the blanks while being infolded, a templet for defining the edge folds thereof, and outfeeding mechanism, the latter adapted to grasp by its infolded edge portion, and pick up and withdraw a folded blank and comprising grasping fingers, means for causing inward and outward movement thereof from blank grasping position to blank releasing position, and movable means for closing and opening said fingers in harmony with their inward and outward movements, said opening and closing means being in continual operative connection with said grasping fingers irrespective of the inward and outward movements.

45. In a folding machine, the combination of folding mechanism, mechanism for causing relative movement between the folded blanks and folding mechanism so that an edge or edges of the blanks shall be above said mechanism, and outfeeding mechanism, the latter adapted to grasp and withdraw a folded blank and comprising grasping fingers, means for causing inward and outward movement thereof from blank grasping position to blank releasing position, and means for closing and opening said fingers in harmony with their inward and outward movements.

46. In a folding machine, the combination of folding mechanism, mechanism for raising above said folding mechanism an edge or edges of a folded blank, and outfeeding mechanism, the latter adapted to grasp and withdraw a folded blank and comprising grasping fingers, means for causing inward and outward movements thereof from blank grasping position to blank releasing position, and means for closing and opening said

fingers in harmony with their inward and outward movements.

47. In a folding machine, the combination of folding mechanism, a vertically movable member, for raising folded blanks above said folding mechanism, and outfeeding mechanism, the latter adapted to grasp and withdraw from the elevated platform a folded blank and comprising grasping fingers, means for causing inward and outward movements thereof from blank grasping position to blank releasing position, and means for closing and opening said fingers in harmony with their inward and outward movements.

48. In a folding machine, the combination of mechanism for infolding the edge portions of fabric blanks for collars and like articles, a support for supporting the blanks while being infolded, a templet for defining the edge folds thereof, and outfeeding mechanism, the latter adapted to grasp by its infolded edge portion, and pick up and withdraw a folded blank and comprising grasping fingers, a long swinging arm, supporting said fingers, with means to swing it for causing inward and outward movements thereof from blank grasping position to blank releasing position, means for bodily raising and lowering the grasping fingers simultaneously with their inward and outward movements and means for closing and opening said fingers in harmony with their inward and outward movements.

49. In a folding machine, the combination of mechanism for infolding the edge portions of fabric blanks for collars and like articles, a support for supporting the blanks while being infolded, a templet for refining the edge folds thereof, and outfeeding mechanism, the latter adapted to grasp by its infolded edge portion, and pick up and withdraw a folded blank and comprising grasping fingers, a long swinging arm, supporting said fingers, with means to swing it for causing inward and outward movement thereof from blank grasping position to blank releasing position, means for closing and opening said fingers in harmony with their inward and outward movements, said opening and closing means being in continual operative connection with said grasping fingers irrespective of the inward and outward movements; and a part with connections for operating the arm-swinging means and the finger opening and closing means in harmony.

50. In a folding machine, the combination of mechanism for infolding the edge portions of fabric blanks for collars and like articles, a support for supporting the blanks while being infolded, a templet for defining the edge folds thereof, with outfeeding mechanism, the latter comprising grasping fingers, mechanism carrying the same for caus-

ing inward and outward movements thereof, finger openers and closers on said carrying mechanism, and a device the movements of which are independent of said inward and outward movements, but coöperable with said openers and closers for actuating them.

51. In a folding machine, the combination of mechanism for infolding the edge portions of fabric blanks for collars and like articles, a support for supporting the blanks while being infolded, a templet for defining the edge folds thereof, with outfeeding mechanism comprising grasping fingers, opening and closing devices therefor, a swinging arm carrying said fingers for moving them from blank-grasping to outward position, and an arc-shaped lever whose arc coöperates with said opening and closing devices in all positions of said arm for operating said devices.

52. In a folding machine, the combination of mechanism for infolding the edge portions of fabric blanks for collars and like articles, a support for supporting the blanks while being infolded, a templet for defining the edge folds thereof, with outfeeding mechanism comprising grasping fingers, opening and closing devices therefor, a swinging arm carrying said fingers for moving them from blank-grasping to outward position, an arc-shaped lever whose arc coöperates with said opening and closing devices in all positions of said arm for operating said devices; and a part with connections for swinging said arm, and for operating said folding mechanism and said arc-shaped lever, all in harmony with each other.

53. A grasping and removing device for a folding machine comprising a carrier, a pair of grasping fingers carried thereon, the first finger movable upwardly and downwardly relatively to the carrier, the second finger pivoted to the first, and a single part which when actuated first forces the fingers together, and then moves both relatively to the carrier; in combination with mechanism for infolding the edge portions of fabric blanks for collars and like articles, a support for supporting the blanks while being infolded, and a templet for defining the edge folds thereof.

54. A grasping and removing device for a folding machine comprising a carrier, a pair of grasping fingers carried thereon, the first finger capable of swinging upwardly and downwardly relatively to the carrier, the second finger pivoted to and on top of the first finger, and having a projection beyond its pivotal connection, and a single part capable of actuating said projection to move upward, so that when actuated it first forces the fingers together, and then moves both upward relatively to the carrier; in combination with mechanism for infolding the edge portions of fabric blanks for collars and like articles, a support for support-

ing the blanks while being infolded, and a templet for defining the edge folds thereof.

55. A creasing and folding machine provided with a table, means for forming flaps and folding the same onto the fabric-body resting on the table, means for automatically raising the fabric-body off the table, a pair of clamping jaws mounted to move inwardly and outwardly about an axis, and said jaws adapted to engage the raised fabric, and means for closing the said jaws, to clamp the raised fabric and carry it to one side.

56. A creasing and folding machine provided with a table, means for forming flaps and folding the same onto the fabric-body

resting on the table, means for automatically raising the fabric-body off the table, a pair of clamping jaws mounted to move inwardly and outwardly about an axis, and said jaws adapted to engage the raised fabric, means for closing the said jaws, to clamp the raised fabric and carry it to one side, and means for opening the jaws for the latter to drop the fabric.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WALTER L. DIXON.

Witnesses:

FREDERICK L. EMERY,
ANNIE E. CHESLEY.