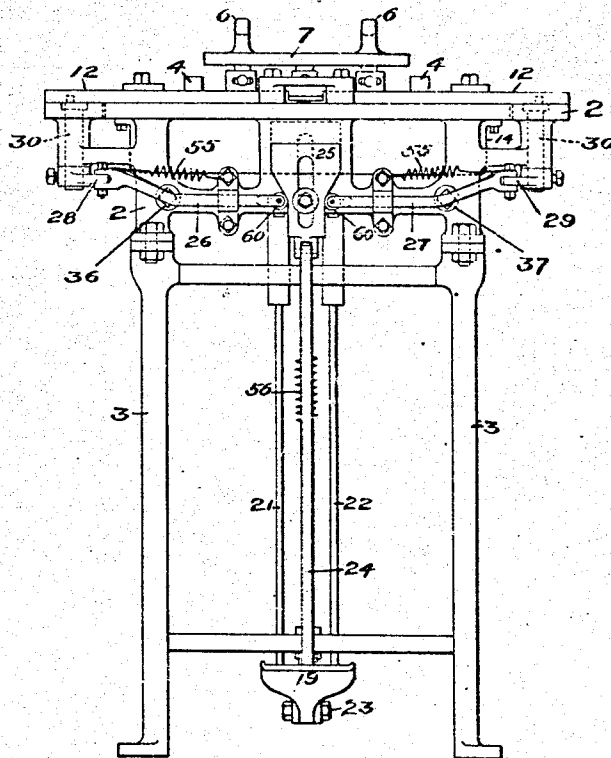
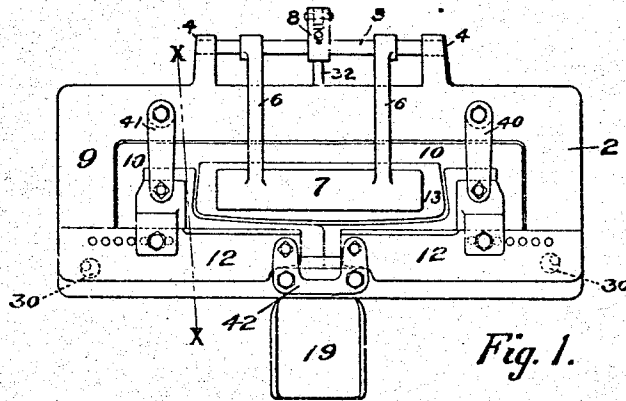


G. W. SMITH.
FOLDING MACHINE.
APPLICATION FILED FEB. 14, 1908.

972,272.

Patented Oct. 11, 1910.

3 SHEETS-SHEET 1.



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3 SHEETS—SHEET 2.

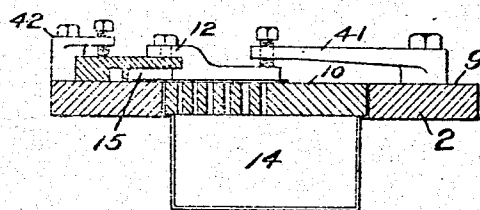


Fig. 6.

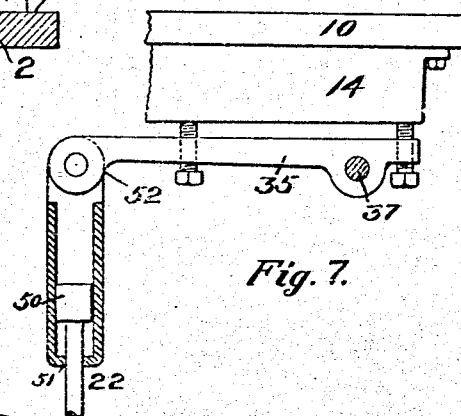


Fig. 7.

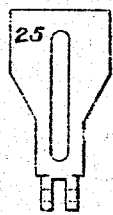


Fig. 4.

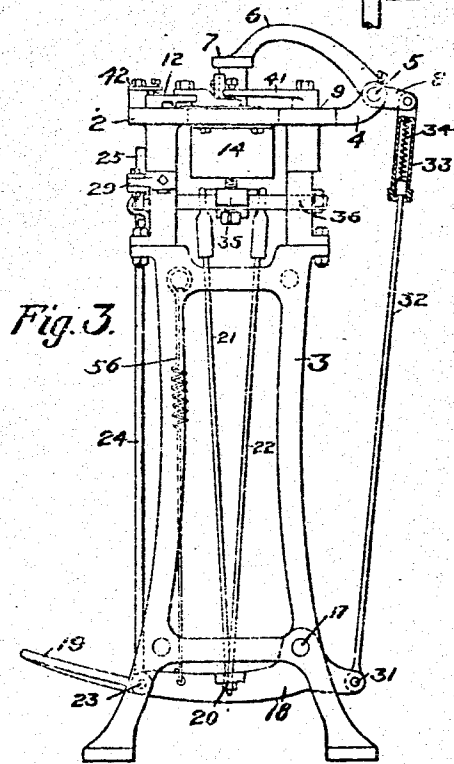


Fig. 3.

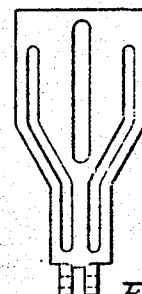


Fig. 5.

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3 SHEETS—SHEET 3.

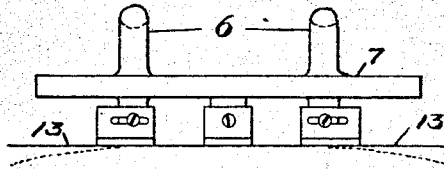


Fig. 8.

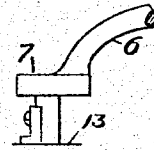


Fig. 9.

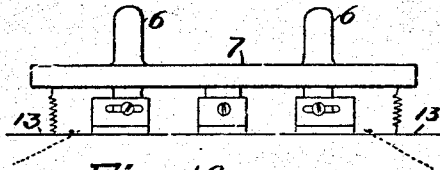


Fig. 10.

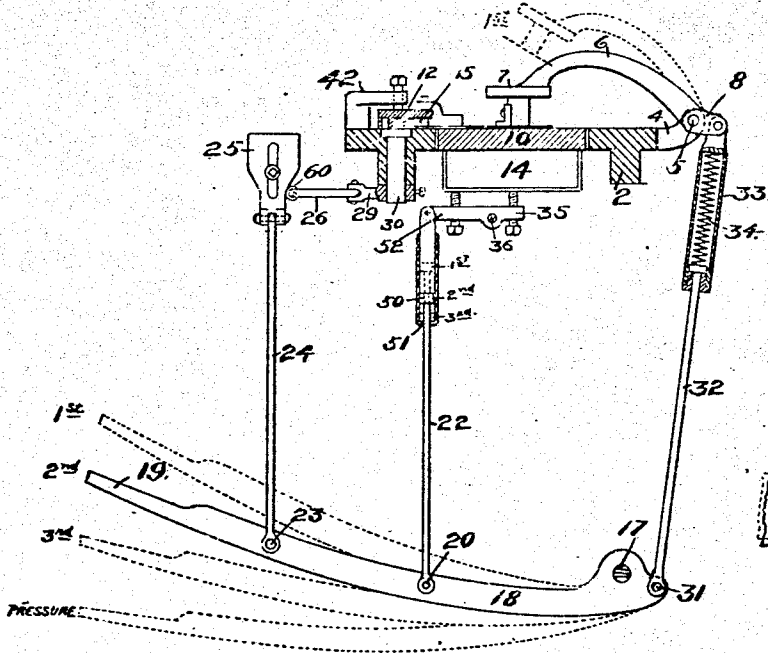


Fig. 11.

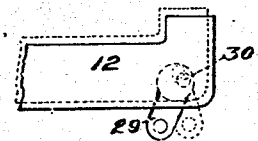


Fig. 12.

Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE W. SMITH, OF COHOES, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
THE BEATTIE MANUFACTURING COMPANY OF COHOES.

FOLDING-MACHINE.

972,272.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Application filed February 14, 1908. Serial No. 415,819.

To all whom it may concern:

Be it known that I, GEORGE W. SMITH, a citizen of the United States, residing at the city of Cohoes, in the county of Albany and State of New York, have invented certain new and useful Improvements in Folding-Machines, of which the following is a specification.

My invention relates to machines for folding collar and cuff blanks, and the objects of my invention are to construct a folding machine in which the bed plate and the infolders will be heated by electricity, and that one operation of the foot pedal will cause the head of the machine carrying the die to press down upon the goods and cause the infolders to fold the edges of the goods over the die, and also press the bed of the machine upward against the infolders, thus pressing the fold smoothly and uniformly over the edges of the die while the die remains within the fold. By removing the pressure from the foot pedal the infolders move backward from over the die and the head of the press carrying the die will move upward from the bed of the press, leaving the operator the free use of both hands for handling the goods. Other advantages will be disclosed hereafter. I accomplish these objects by means of the mechanism illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of my machine with the die head down, the die resting upon the bed plate. Fig. 2 is a front elevation. Fig. 3 is a side elevation. Fig. 4 is a detail view of the wedge-shaped cam used to operate the infolders. Fig. 5 is a detail view of a modified form of Fig. 4. Fig. 6 is a section of the bed and infolders along the line X-X on Fig. 1. Fig. 7 is a detail of the lever and telescoping rod used to raise the bed. Figs. 8 and 9 are detail views of the die head and die. Fig. 10 is a detail of a modified form of die. Fig. 11 is a diagram showing the manner in which the successive operations are performed by means of my machine. Fig. 12 is a detail view showing the manner of operating the infolders.

Similar numerals refer to similar parts throughout the several views.

In the manufacture of cuffs and collars, the blanks from which they are made are placed upon the heated bed or support of a

folding machine. The die or former of the shape desired is then pressed down upon the blank and infolders fold the edges of the blank over the die, while the blank is upon the heated support and press the folds either before or after the withdrawal of the die, thus making smooth edges of the goods, ready to be sewed or stitched and in the shape desired.

Referring to the drawings, 2 is the frame of the machine and is mounted upon the supplemental frame 3, or upon any suitable support. The frame, 2, has projecting from the back side thereof the arms, 4, 4, which contain the bearings for the rocking shaft, 5, to which the arms, 6, 6, of the die head, 7, are attached. To the shaft, 5, is also attached the crank arm, 8.

The top of the frame, 2, has an opening in the center adapted to receive the bed plate, 10. The normal position of the face of the bed plate being flush with the surface, 9, of the frame 2. This bed plate, 10, is vertically movable as hereafter described.

Attached to the under side of the bed plate, 10, is a box, 11, in which are placed suitable resistance coils for generating heat by electricity. The bed plate, 10, forms the top of the box, so that it is readily heated by the heat generated in the coils.

The portions of the infolders lying over the box, 11, are heated by being in contact with the bed plate, 10, or may be heated by means of perforations through the bed plate, allowing the heated air to pass upward and come in direct contact with the infolders.

The under sides of the infolders, 12, have hollow spaces, 15, adapted to receive suitable electric heating means. The heating means being for the purpose of heating the portions of the infolders which do not lie over the box, 11, thus providing for the heating of the entire infolders.

Pivoted in the supplemental frame, 3, at 17 is the foot lever 18, having a pedal portion, 19. Attached to the lever, 18, at 20 are the telescoping rods, 21 and 22, connecting the foot lever 18 to the levers 35. The levers, 35, being pivoted in the frame, 2, at 36 and 37, and adapted to exert an upward pressure upon the bed plate 10. At point 23 is attached the rod, 24. The upper end of the rod, 24, is attached to the wedge shaped cam, 25 (Figs. 2 and 3) mounted on the

front side of the frame, 2. I also mount on the front of the frame, 2, the connecting rods, 26 and 27, said rods being provided with suitable rollers, 60, at the ends which are in contact with the cam, 25.

The connecting rods, 26 and 27, are jointed to the crank arms, 28 and 29, attached to the crank shafts, 30, 30. The crank shafts, 30, 30, operate the infolders as shown and described in United States Letters Patent No. 666,766 issued to John Maitland and Walter John Beattie, January 29th 1901, this invention being intended as an improvement to the machine shown and described in said patent.

Attached to the foot lever, at 31, is the rod, 32, arranged so as to telescope into the spring case, 33, against the pressure of the spring, 34. The spring case, 33, being attached to the crank arm, 8, on the rocking shaft, 5.

On the face, 9, of the frame, 2, are securely fastened the bracing arms, 40, 41 and 42, adapted to resist any upward motion of the infolders, 12, 12, while allowing them free lateral movement.

The die, 13 is non-collapsible. It consists of a thin sheet of flexible steel, preferably about eight mills thick, attached to a suitable head, 7. The die may be made in sections for increasing the length to correspond with the size of the collar or cuff which it is desired to produce. A die and head of this type is illustrated in Figs. 8 and 9. Or a different die may be used for each size or style of collar or cuff, as desired.

Fig. 10 illustrates a modification of the die, 13, the steel sheet being hinged at some distance from one end and provided with a flexible spring to return the loose end to a horizontal position, the hinge being so constructed as to allow the end to bend downward but not upward. The above described dies permit the removal of the folded blanks without appreciable disturbance of the fold or crease.

The operation of my collar and cuff turner is as follows: The goods come to the machine thoroughly damped, the operator places the blanks upon the bed, then presses with his foot upon the pedal, 19. This turns the foot lever, 18, upon its pivot, 17, and forces upward the rod, 32, against the spring, 34, in the spring case, 33. Thus the spring, 34, forces upward the crank arm on the rocking shaft, 5, causing the die head, 7, to rotate about its pivotal bearings, 4, 4, and bring the die, 13, into contact with the "blanks" on the bed, 10. A further motion downward of the pedal, 19, will cause the spring, 34, to be compressed, increasing the pressure of the die upon the work.

Referring to Fig. 11, the position of the pedal, foot lever, die head and wedge shaped cam before pressure is exerted on the pedal

is indicated by dotted lines and marked 1st. It will be seen that in this position the head is clear of the bed and ample space is provided for the operator to insert the blanks to be folded. The blanks are placed in the machine in the usual manner. The operator then presses down with his foot upon the pedal, 19, moving it in rapid succession from 1st to 2nd then to 3rd and to pressure.

As shown in the drawing when the pedal reaches the position marked "Second" the die head by the action of the crank shaft, 8, spring, 34, rod, 32 and foot lever, 18, has been forced into contact with the work upon the bed, 10. This motion of the pedal, 19, and foot lever, 18, has caused the wedge shaped cam, 25, to be drawn down until the cam is just starting to act. The movement of the pedal from 2nd to 3rd causes the cam to force the connecting rods, 26 and 27, to move outward. These rods in turn causing the crank shafts 30 to turn and force the infolders inward folding the goods over the edge of the die. Further downward motion of the pedal will bring the head, 50, of the telescoping rods, 21 and 22, to come in contact with the shoulder, 51, and draw downward the arm, 52, of the lever, 35, causing the lever, 35, to rotate about its pivot, 36, and exert pressure upward on the bed plate, 10. The infolders, 12, 12, being now moved forward onto the die upward pressure will be applied to the infolders. This being resisted by the bracing arms, 40, 41 and 42 an enormous pressure upon the fold is obtained. For the purpose of returning the parts to the original or 1st position I arrange the springs, 55, to withdraw the infolders and the spring, 56, to return the pedal and foot lever. If I use the modified form of cam shown in Fig. 5 the springs, 55, may be omitted.

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

1. In a folding machine, a rigid frame, a bed plate movable within the frame, means within the bed plate for heating the same, a die plate adapted to cooperate with the bed plate for clamping between them a blank to be folded, slidable infolders for folding the edges of a blank over the die plate each infolder being provided with means for the insertion of heating means, means for simultaneously operating the infolders, and means for pressing the bed plate and die plate into cooperative relation, turning the edges of the blank over said die and forcing said bed and die against the infolders to press the turned edges of the blank.

2. In a folding machine, a rigid frame, a bed plate movable within said frame, means for operating the bed plate, means within the bed plate for heating the same, a die plate adapted to cooperate with the

bed plate for holding a blank on the bed plate, infolders for turning the edges of the blank over the die plate each infolder being provided with means for the insertion of heating means independent of the bed plate heating means.

3. A machine for folding collar and cuff blanks, consisting of a frame; a vertically movable bed plate mounted thereon; infolders adapted to fold the edges of collar and cuff blanks resting on said bed plate over the edges of the die pressing upon said blanks; means for heating said bed plate and infolders; a head piece hinged upon said frame; a die attached to said head piece adapted to press the blank upon said bed plate; a foot lever pivoted to said frame; a rod connecting said head piece to said foot lever, whereby the pressing down of said foot lever by the operator will press said die down upon the bed plate; means for operating said infolders by said foot lever and means for pressing upward said heated bed plate by said foot lever, whereby the single movement by the foot downward upon the end of said foot lever will press the die upon the goods on the bed plate, move the infolders inwardly folding the edges of the goods over the edges of the die and press the bed plate upward, thereby pressing the fold of the goods between the bed plate and the infolders over the edges of the die, substantially as described.

4. A machine for folding collar and cuff blanks, consisting of a frame; a bed plate mounted thereon; a die adapted to press upon the blank lying upon the bed plate; infolders adapted to fold the edges of the blank over the die resting thereon; a movable head piece carrying said die; a foot lever pivoted to said frame; means for operating said head piece by said lever; a rod attached to said lever; a wedge shaped cam mounted upon said rod; horizontally movable arms mounted upon said frame, one on each side of said wedge shaped cam and in contact therewith and adapted to be moved horizontally by said cam as it descends between them; crank shafts adapted to operate the infolders means for operating the crank shafts by said horizontally movable arms, whereby the downward movement of said foot lever will press the said die upon the blank on the bed plate and move the infolders inwardly over the die, substantially as described.

5. A machine for folding collar and cuff blanks consisting of a frame; a vertically movable bed plate mounted thereon; a head piece pivoted to said frame at the rear thereof; a thin flexible metallic die attached to said head piece, one end of said die being hinged to the body thereof and adapted to be swung downward, a flexible spring attached to said hinged end and adapted to

return it to a horizontal position, a foot lever pivoted to said frame; a foot pedal on the front end of said foot lever; a rod attached to said foot lever in the rear of the fulcrum thereof; said rod attached to said head piece and adapted to operate the same, whereby the downward movement of said pedal will press said die upon the bed plate; infolders adapted to fold the edges of the blanks upon the bed plate over the edges of the die pressing thereon; cranks adapted to operate said infolders; a vertical rod attached to the front portion of said foot lever; a wedge shaped cam mounted upon said rod; horizontally movable arms mounted upon said frame one on either side of said cam and in contact therewith; said arms being jointly connected to said cranks, whereby the said cam descending between said arms is adapted to move each arm outwardly thereby turning said cranks and operating said infolders; a lever pivoted to said frame under said bed plate; the short end thereof adapted to operate against the bottom of said bed plate; a rod connecting the long end of said lever with said foot lever in front of the fulcrum, whereby the downward movement of the said pedal is adapted to press said bed plate upwardly; braces attached to said frame above and in contact with said infolders when they are contracted inwardly over the bed plate; said rods being so arranged and adjusted that the downward movement of said pedal will first press the die upon the blank upon the bed plate and the continued downward movement of said pedal will secondly contract the infolders, folding the edges of the blank over the die and the continued downward movement of the pedal will then press the bed plate upward against the infolders, substantially as described.

6. A machine for folding collar and cuff blanks, consisting of a frame; a vertically movable bed plate mounted thereon; a head piece pivoted to said frame at the rear thereof; a thin flexible metallic die attached to said head piece; a foot lever pivoted to said frame; a foot pedal on the front end of said foot lever; a rod attached to said foot lever in the rear of the fulcrum thereof; said rod attached to said head piece and adapted to operate the same, whereby the downward movement of said pedal will press said die upon the bed plate; infolders adapted to fold the edges of the blanks upon the bed plate over the edges of the die pressing thereon; cranks adapted to operate said infolders; a vertical rod attached to the front portion of said foot lever; a wedge shaped cam mounted upon said rod; horizontally movable arms mounted upon said frame one on either side of said cam and in contact therewith; said arms being jointly connected to said cranks, whereby the said cam

descending between said arms is adapted to
move each arm outwardly, thereby turning
said eccentrics and operating said infolders;
a lever pivoted to said frame under said
5 bed plate, the short end thereof adapted to
operate against the bottom of said bed plate;
a rod connecting the long end of said lever
with said foot lever in front of the fulcrum,
whereby the downward movement of the said
10 pedal is adapted to press said bed plate up-
wardly; braces attached to said frame above
and in contact with said infolders when they
are contracted inwardly over the bed plate;
said rods being so arranged and adjusted
15 that the downward movement of said pedal
will first press the die upon the blank upon
the bed plate and the continued downward
movement of said pedal will secondly con-
tract the infolders folding the edges of the
20 blank over the die and the continued down-
ward movement of the pedal will then press

the bed plate upward against the infolders,
substantially as described.

7. In a folding machine, a rigid frame
provided with a bed plate adapted to be 25
heated, a movable die arranged to clamp
blanks to be folded on the upper surface of
said bed plate, infolders adapted to turn the
edges of said blank over the edges of said
die, and means for producing pressure be- 30
tween the bed plate and the die and in-
folders, each of said infolders being pro-
vided with means for the insertion of heat-
ing means separate of the bed plate heating
means. 35

In testimony whereof I have affixed my
signature in presence of two witnesses.

GEORGE W. SMITH.

Witnesses:

WALTER JOHN BEATTIE,
LOTTIE PRIOR.