

G. J. DORMANDY.
FOLDING MACHINE.

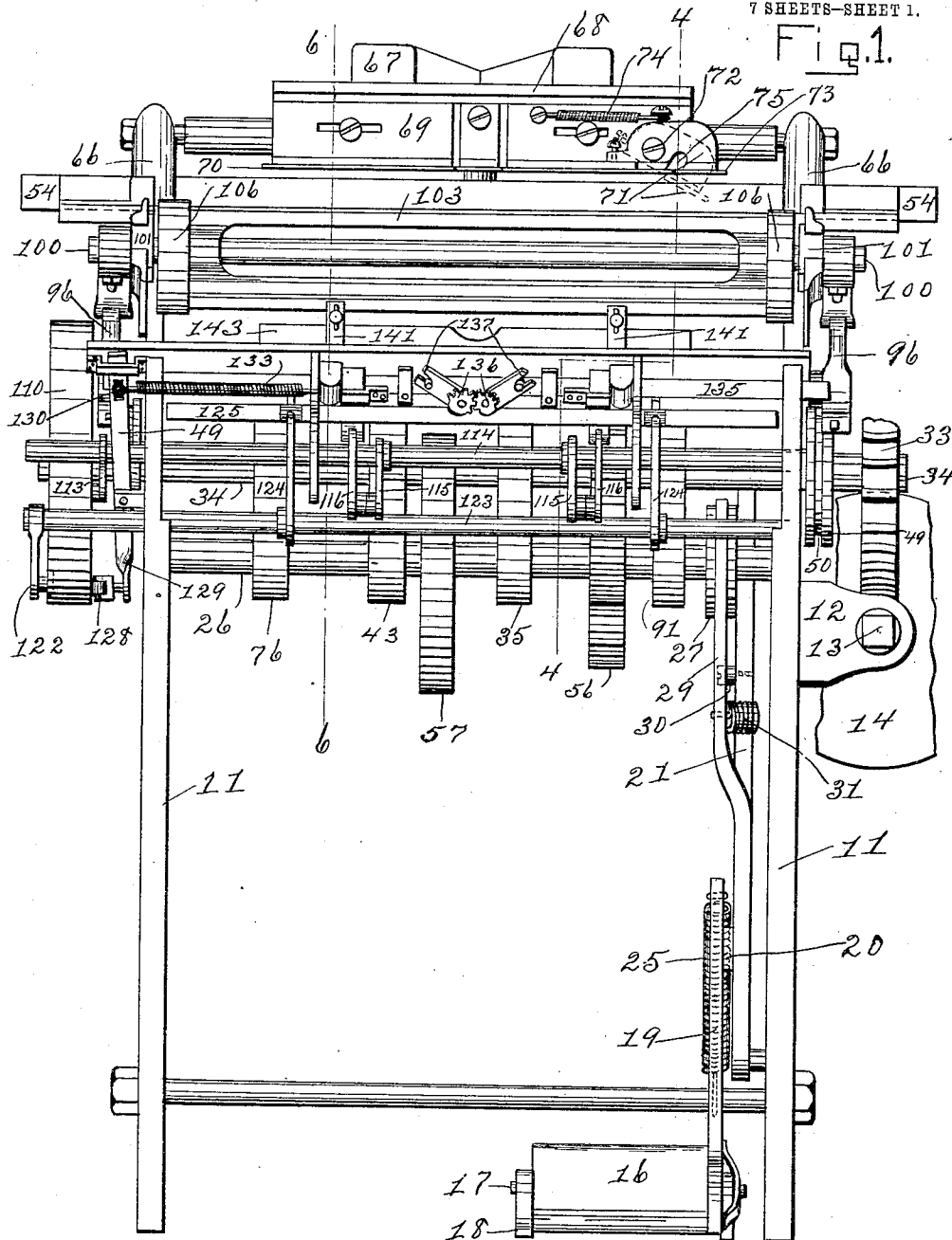
APPLICATION FILED MAY 13, 1911.

Patented Feb. 25, 1913.

1,054,094.

7 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Wm. G. Jeff.
Helen Carlton.

Inventor

Gary J. Dormandy
By

John H. Popen
Attorney.

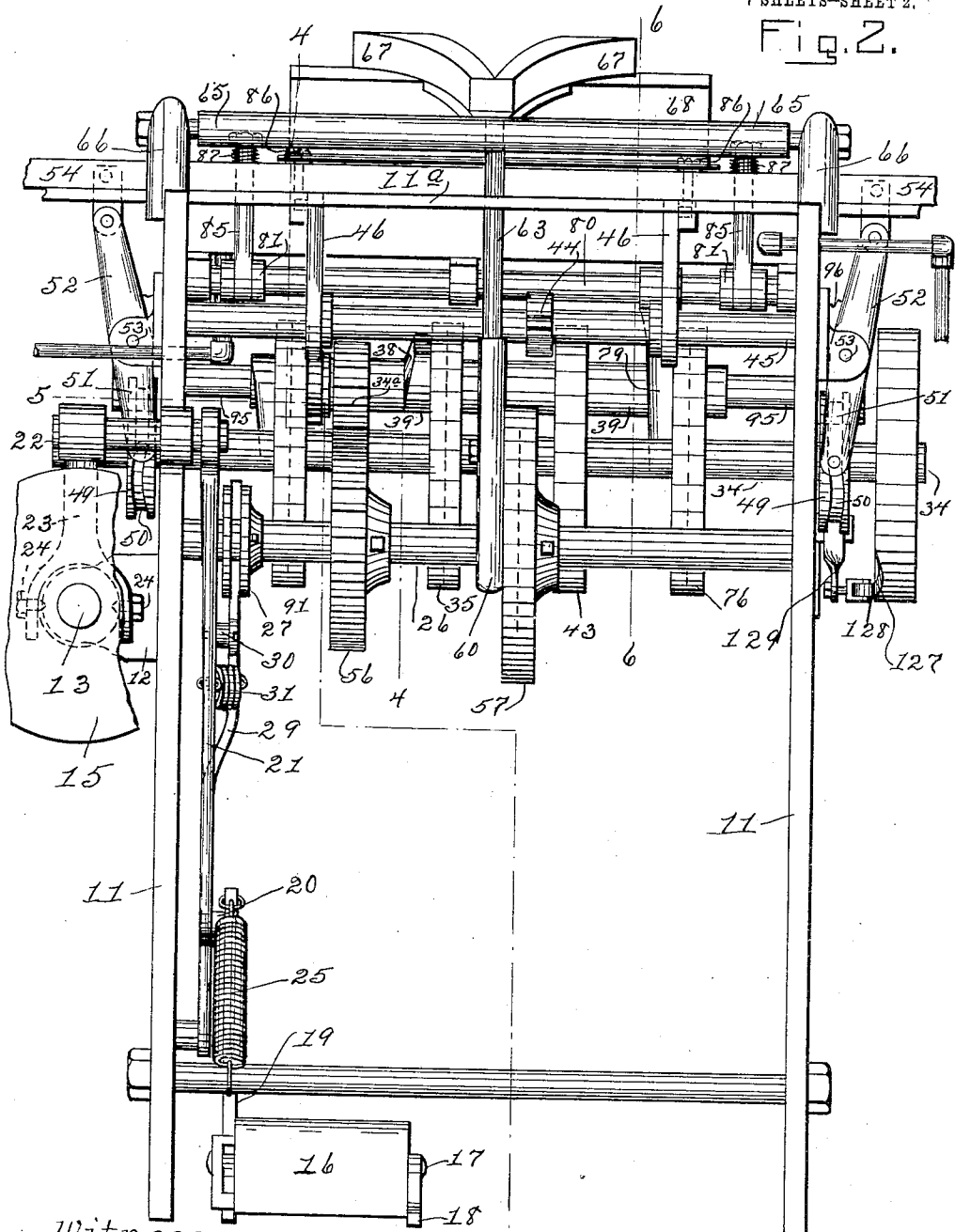
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7 SHEETS—SHEET 2.

Fig. 2.



Witnesses:

Wm. G. Repp.
Helen Carlton.

Inventor

Gary J. Dormandy

By

Geo. L. Cooper

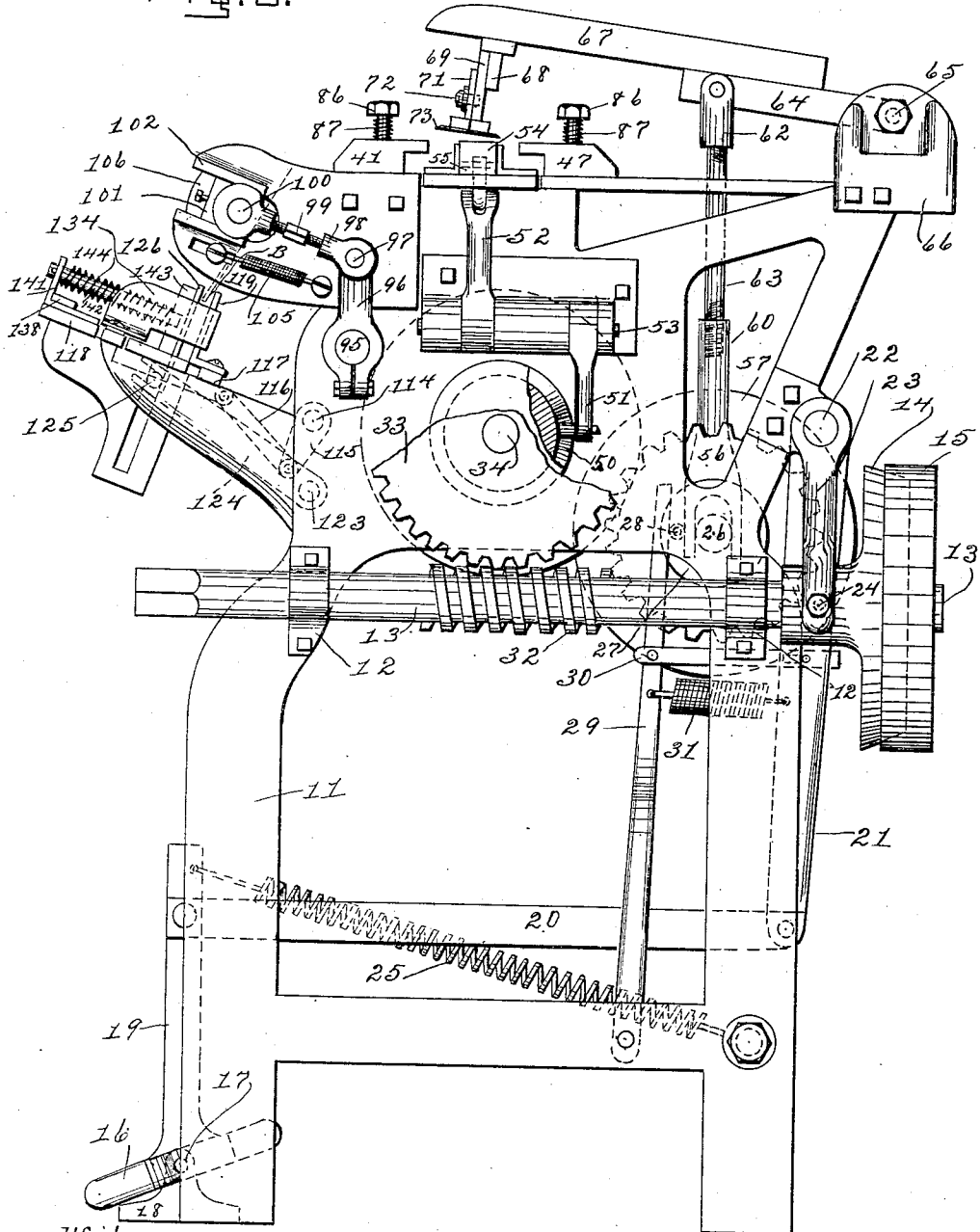
Attorney

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7 SHEETS—SHEET 3.

Fig. 3.



Witnesses:

Wm. G. Jeff.
Helen Carton.

Inventor

Garry J. Dormandy
By

Geo. L. Cooper
Attorney

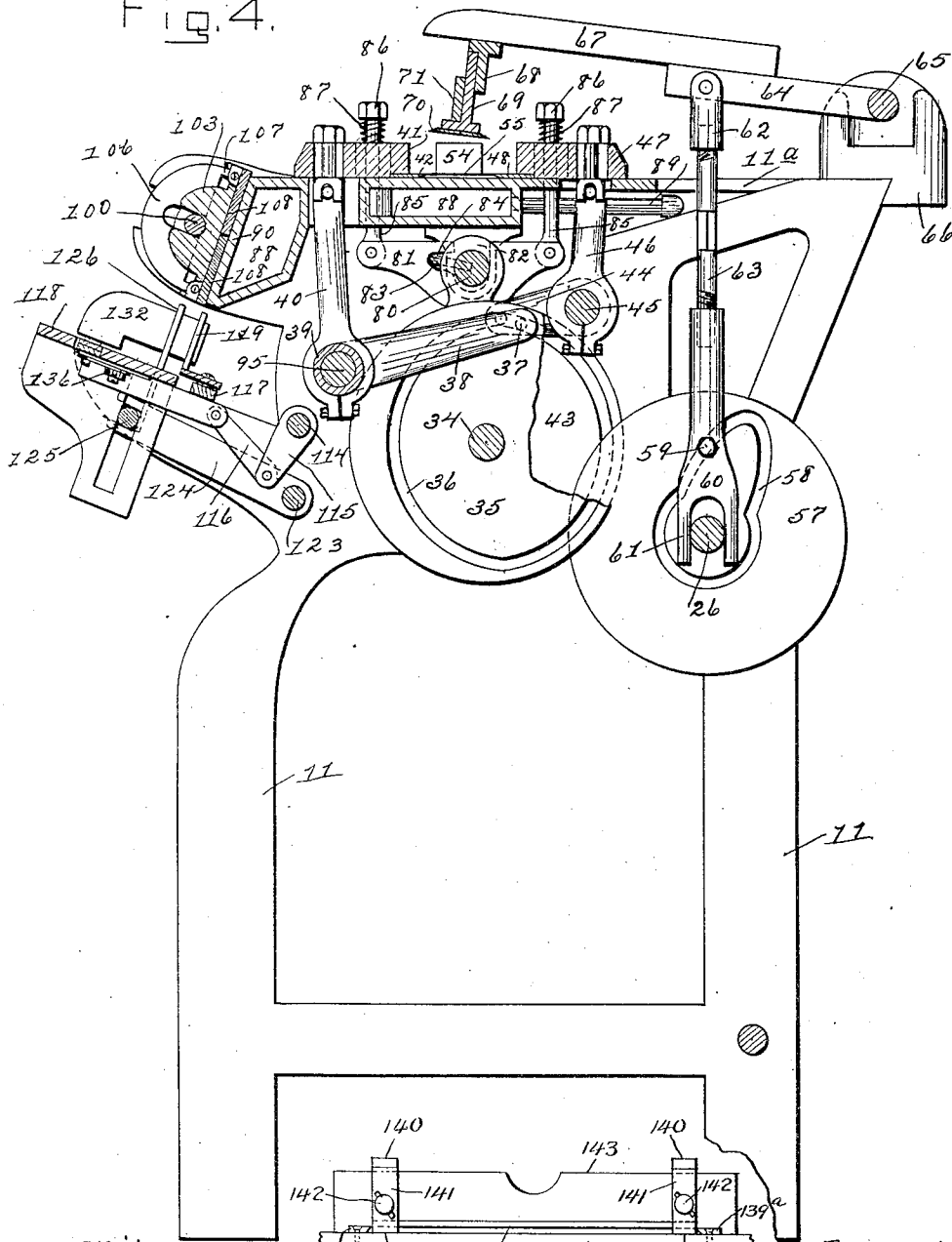
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7 SHEETS—SHEET 4.

Fig. 4.



Witnesses:

Wm. G. Zepf
Helen Carlton

Fig 14

Inventor

Garry J. Dormandy

By

Geo. L. Cooper
Attorney

G. J. DORMANDY.
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7 SHEETS-SHEET 5.

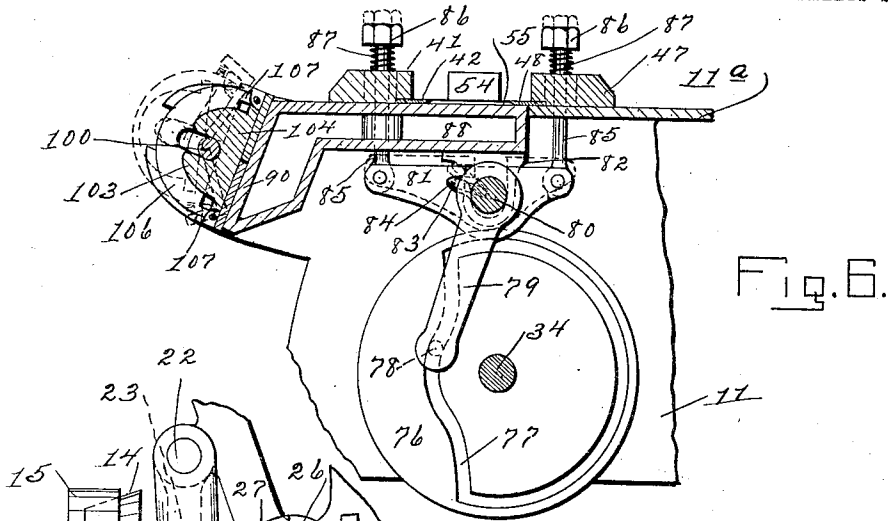


Fig. 6.

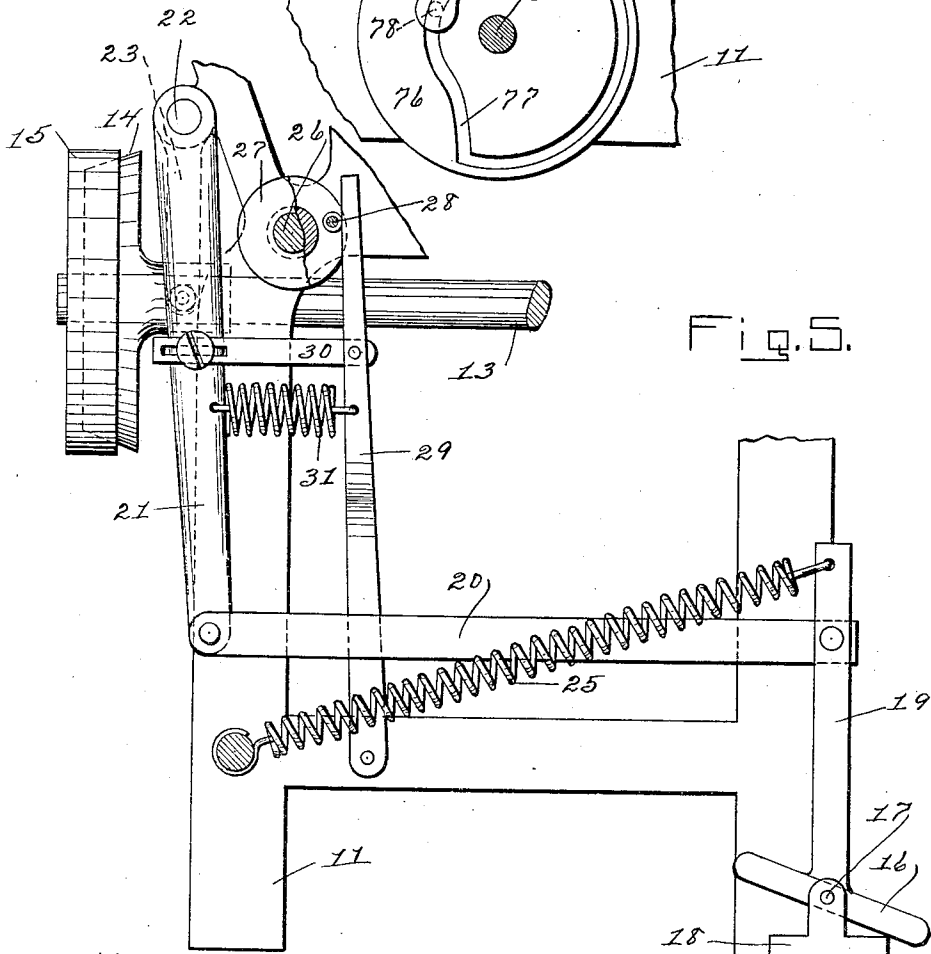


Fig. 5.

Witnesses:

Wm. G. Jeff.
Helen Carlton.

Inventor

Gary J. Dormandy
By

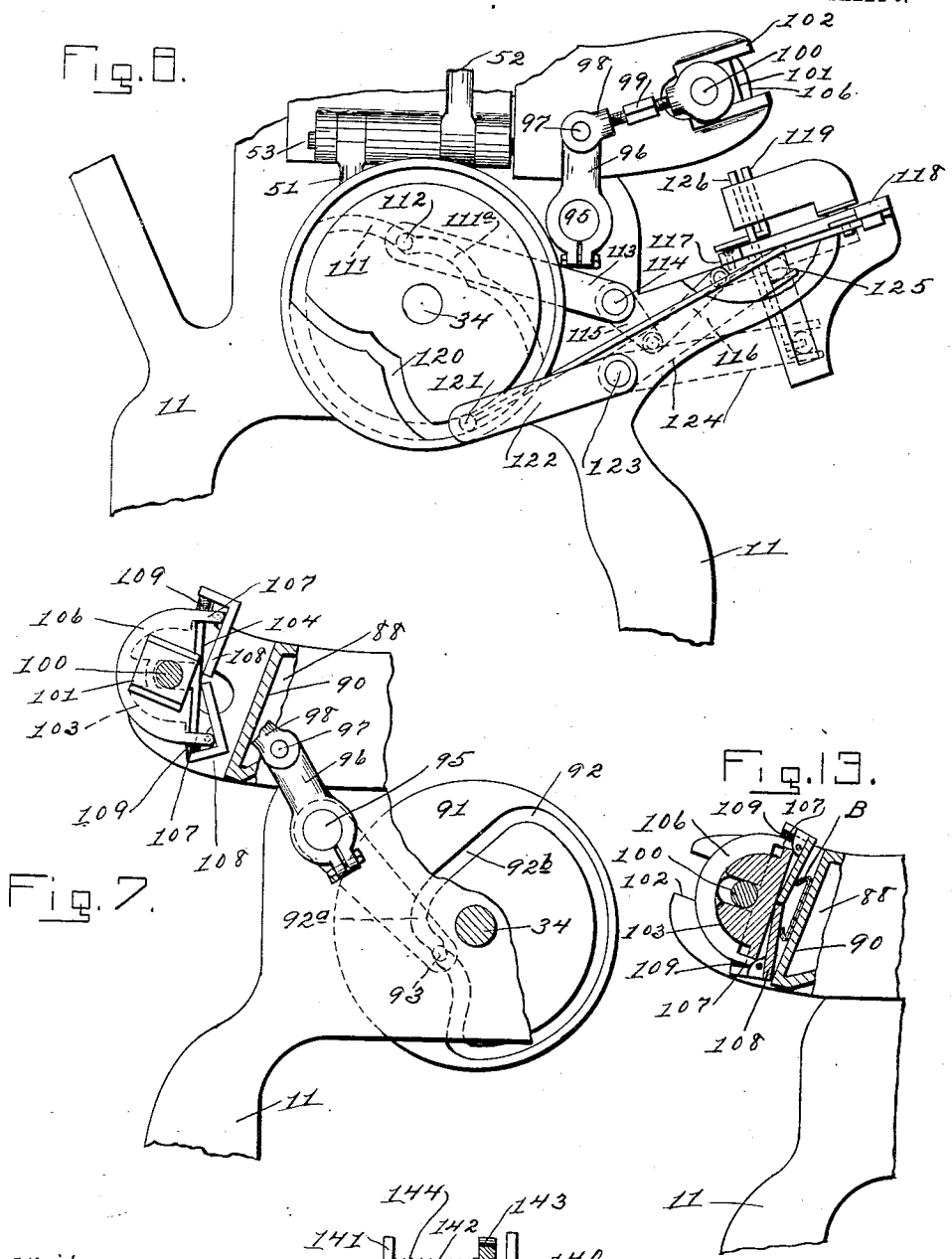
Geoffrey
Attorney

G. J. DORMANDY.
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7 SHEETS-SHEET 6.



Witnesses:
Wm. G. Zepf.
Helen Carlton.

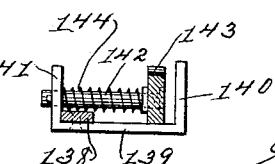


Fig. 12.

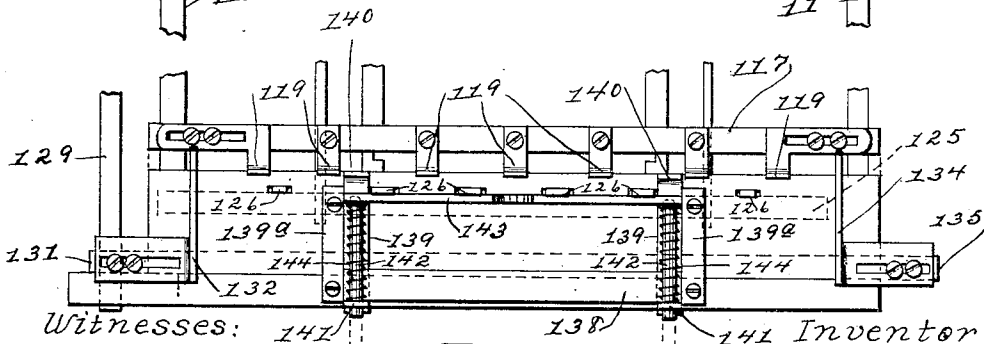
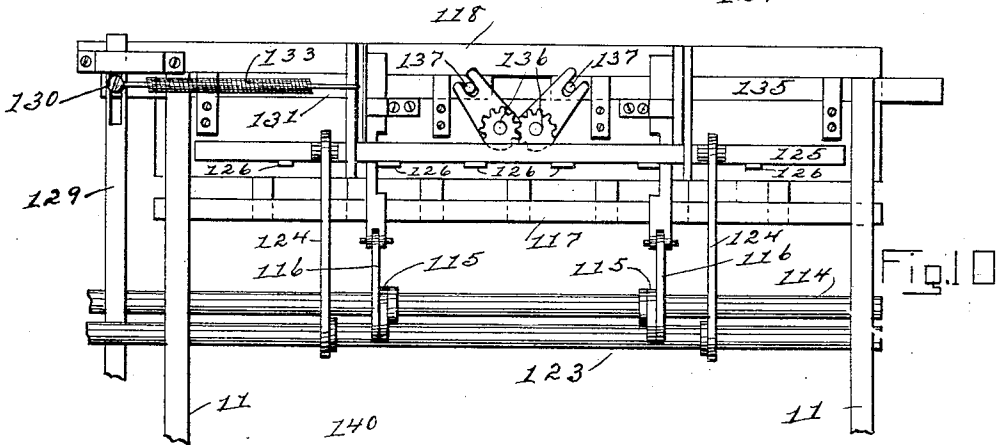
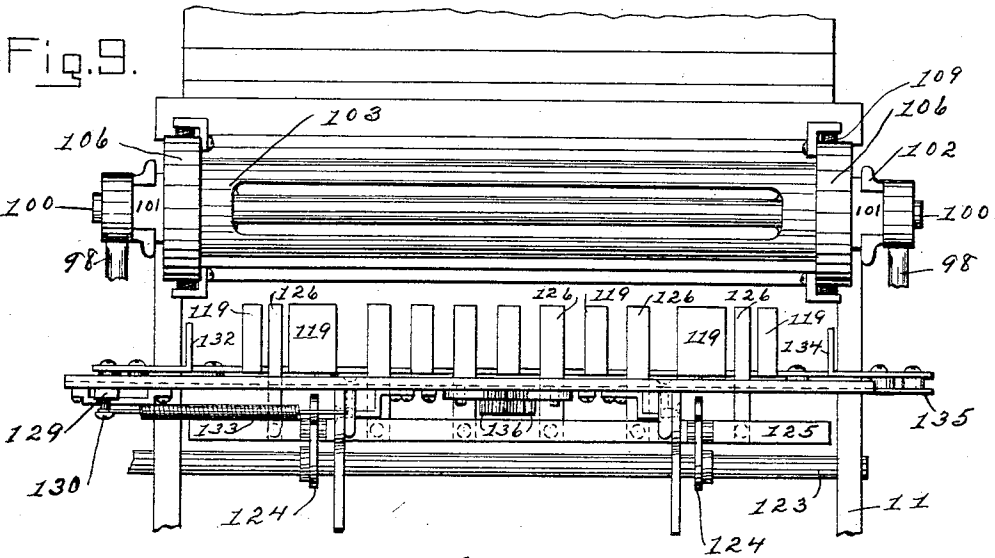
Inventor
Garry J. Dormandy
By
Wm. L. Cooper
Attorney

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1,054,094.

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7 SHEETS-SHEET 7.



Witnesses:

Wm. G. Jeff.
Helen Carlton.

Fig. 11.

Inventor

G. J. Dormandy
By

Jos. L. Cooper

Attorney

UNITED STATES PATENT OFFICE.

GARRY J. DORMANDY, OF TROY, NEW YORK, ASSIGNOR TO UNITED SHIRT AND COLLAR COMPANY, OF TROY, NEW YORK, A CORPORATION OF NEW YORK.

FOLDING-MACHINE.

1,054,094.

Specification of Letters Patent.

Patented Feb. 25, 1913.

Original application filed August 3, 1910, Serial No. 575,326. Divided and this application filed May 13, 1911. Serial No. 627,081.

To all whom it may concern:

Be it known that I, GARRY J. DORMANDY, a citizen of the United States, residing at Troy, Rensselaer county, 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 and pressing blanks for collars, cuffs and like articles. Its object is to fold the blanks smoothly and correctly, to press them after folding so that the edges of the blanks will perfectly maintain their folded position, and to "bunch" the folded and pressed blanks so that any desired number of them may be taken from the machine in superposed position.

Further objects of the invention, as well as the means for effecting such objects will appear in this specification and be pointed out in the claims.

In the drawings, Figure 1 is a front; Fig. 2, a rear; and Fig. 3, a right-end elevation of the particular embodiment of my invention, which I have selected for illustration; Fig. 4 is a vertical section through the plane 4—4, Fig. 1; Fig. 5 is a partial vertical section through the plane 5—5, Fig. 2; Fig. 6 is a similar view through the plane 6—6, Fig. 1; Figs. 7 to 14 illustrate details of the invention, as will be hereafter explained.

11 designates the main frame or standard of the machine, provided at its right end with bearings for a shaft 13, on which is keyed coupling member 14, adapted to clutch with loose pulley 15, which may be continuously driven by suitable means, as a belt, not shown. A pedal 16 pivoted at 17 in floor brackets 18 carries a rigid arm 19 pivotally connected by bar 20 to arm 21, the upper end of which is fast on a short rock shaft 22, to which is also secured a forked arm 23 connected by pins 24 to the collar portion of clutch member 14. A spring 25 acts through parts 19 to 24 to normally hold the clutch members 14, 15 in operative position. A shaft 26 carries disks 27, on one (or both) of which is mounted a roller pin 28 bearing against a lever 29, which is connected by link 30 and pull spring 31 to arm 21, whereby each rotation of shaft 26 acts to uncouple clutch members 14, 15, and stop the machine. On fore and aft shaft 13 is a worm gear 32 driving cogwheel 33 on

shaft 34, on which is fast cam wheel 35, the face of which is formed with cam slot 36, in which rides pin 37 projecting laterally from arm 38, the other end of which is fast to hollow rock shaft 39, to which shaft is also clamped a plurality of arms 40, which pass upward through suitable apertures in bed-plate 11^a of the machine, and have pin and slot connection with front folder bar 41, to which is detachably secured front folder blade 42. A second cam wheel 43 is also fast on shaft 34 and acts through arm 44 to rock shaft 45, on which are clamped, as before, arms 46 connected to rear folder bar 47, carrying folder blade 48, see Fig. 4. Near each end of shaft 34 is secured a cam wheel 49 having a peripheral cam groove 50, which acts through levers 51, 52, both fast on rock shaft 53, to move end folder bars 54 and their attached blades 55, see Figs. 2 and 3. Meshing with gear wheel 34^a on shaft 34 is a gear wheel 56 on the shaft 26, which shaft carries a cam wheel 57 having a face cam groove 58 in which moves pin 59 in arm body 60, the lower end of which is forked at 61 for free vertical movement on shaft 26. A head portion 62 is connected to body part 60 by a right and left threaded rod 63, the head 62 being forked to engage lever 64 pivoted at 65 to a pair of ears 66 on frame 11. To lever 64 is secured a V-shaped carrier 67 having a depending portion 68 to which is adjustably bolted supporting bar 69 for templet blade 70. As shown, bar 69 and blade 70 are divided into separate parts in the usual manner. In addition, one end of bar 69 carries a part 71 pivoted at 72 and provided with a blade portion 73, which forms one end of templet 70, and is normally held in a plane therewith by spring 74, the part 71 being notched at 75 to permit the downward movement of blade portions 73, see Figs. 1 and 4.

On shaft 34 is a cam wheel 76 having on its face a cam groove 77 in which rides pin 78 on an arm 79 fast on rock shaft 80. On shaft 80 are two inverted saddles 81, each having a notch 82 freely embracing shaft 80 and formed with a transverse recess 83, in which engages a pin 84 on the shaft 80. Pivottally attached to and rising from the part 81 at each end thereof is a bolt 85, which bolts pass through open slots in the bed 11^a and folder bars 41, 47. At the top

of each bolt is a nut 86, between which and the upper surface of the folder bar is a spring 87, see Figs. 4 and 6. A steam chest 88 is formed beneath the front portion of the bed 11^a, fed by a pipe 89, and extending forwardly to an angularly disposed front wall 90.

On shaft 34 is a cam 91 having a cam groove 92, in which moves pin 93 on arm 94, which rocks shaft 95 at the ends of which are arms 96 pivoted at 97 to arms 98 having right and left threaded adjusting rod 99 to a rock shaft 100 guided by bearings 101 sliding in ways 102 and carrying a swiveled casting 103, which has a plane rear face 104, the longer edge of which is normally drawn rearwardly by springs 105. Mounted on shaft 100 at the ends of casting 103 are ears 106 having upper and lower rearward projections 107, on which are pivoted "shutters" 108 of L-shaped cross section. Springs 109 tend to hold the shutters 108 in the angular position shown in Fig. 7.

Mounted at the left end of shaft 34 is a cam wheel 110 having in its inner face cam groove 111, in which moves pin 112 in arm 113, which acts to rock shaft 114 carrying two pairs of pivoted arms 115, 116 for reciprocating a longitudinal bar 117 mounted at the rear of an inclined bed 118. The bar 117 carries a plurality of blades or fingers 119, which are beneath and normally in the plane of the front wall 90 of the steam chest 88. The outer face of cam wheel 110 has a groove 120, in which rides pin 121 on arm 122, which rocks shaft 123, on which are two forked arms 124, which embrace bar 125, from which extends upwardly a second series of blades or fingers 126, which pass through slots in the bed 118 in front of the normal position of the blades 119. In the periphery of the wheel 110 at its inner side is a cam depression 127 coacting with a roller 128 on a lever 129 having pin and slot connection at 130 with a bar 131 beneath the bed 118, whereby the bar may be reciprocated longitudinally of the bed. A transverse blade 132 is secured to the end of bar 131 so as to move above the bed. A pull spring 133 is attached to bar 131 and acts to hold roller 128 against the periphery of wheel 110. A similar blade 134 at the opposite end of bed 118 is secured to bar 135 which is moved with bar 131, but in an opposite direction, by two small gears 136 and pin and slot connections 137 beneath bed 118. Figs. 11, 12 and 14 show a removable carrier, consisting of a bar 138 having at its ends cross pieces 139, the outer edges of which slide under guides 139^a on bed 118, the cross pieces being formed with rear upturned fingers 140, normally in a plane with the rear blades 119, and upturned front fingers 141 through which pass

rods 142, the rear ends of which are secured to a board 143, which is forced rearwardly by springs 144 on the rods 142.

Premising that the particular machine illustrated is set up for infolding blanks for collar bands or tops, and that these ordinarily consist of two plies, the word "blank" being used to designate these two superposed plies, the operation of the machine is as follows: The operator places a blank upon the bed 11^a of the machine in the space beneath the templet 70, Fig. 4. He then starts the machine by tilting the pedal 16, which acts through parts 19 to 24, Fig. 5, to engage the clutch member 14 with the constantly driven pulley member 15. The templet is then forced down on the bed, or on the blank thereon, by the action of cam 57, Fig. 4, and dwells there while pin 59 travels around the concentric portion of the cam groove 58. During this time the end infolder blades 55, actuated by the cams 49 and connecting parts 51 to 54, act to fold the ends of the blank over the ends of the templet 70, Figs. 2 and 3; after which the front and rear folder blades 42 and 48, moved by cams 35 and 43 and connecting parts, Fig. 4, infold the long edges of the blank. The folding being thus completed, the cam 75 acts through parts 78 to 87 to force the folding blades downward toward the bed 11^a, heated by steam or otherwise, to set the folds, the pressure being regulated by the nuts 86 acting through springs 87. The pressure being withdrawn by the passing of the pin 78 (Fig. 6) into the concentric portion of the cam groove 77, all four infolder blades are retracted and the templet raised to its highest position, at which time the pin 28 (Fig. 5) bears against lever 29, withdraws clutch member 14 from engagement with member 15, and stops the machine. So far, the operation of the machine, broadly speaking and as distinguished from the means employed to effect it, is well known in the art. But in practice, the folded edges of the blank are found to be inadequately pressed, *i. e.*, they will not remain snugly folded during the necessary handling prior to and during the stitching operation. I will now describe the operation of the means for secondarily and thoroughly pressing the blanks before they can escape from their folds. The folded blank being now upon the elevated templet is removed therefrom by the operator, who takes hold of its right end, depresses the part 71 of the templet 70 to the position shown in dotted lines, Fig. 1, which shortens the templet, slips the blank slightly to the left, and takes it off the templet without seriously disturbing its folds. At this time, when the machine is stopped, the parts of my novel pressing device are nearly in the position shown in Fig. 7, *i. e.*, the pin 93 is

in that portion of the cam groove 92 marked 92^a, whereby the shaft 100, with the presser casting 103 and the shutters 108 carried thereby, is at nearly its greatest distance from the front wall 90 of the steam chest 88, and the free edge of the lower shutter 108 is forced inward against the face 104 of the casting. This forms an open pocket between the wall 90 and the shutters 108, which pocket is substantially closed at its bottom, and into which the operator drops the blank which he has just removed from the templet. When the machine is started, the cam 91 acts both to rock the shaft 100 and to drag it toward wall 90, its closed position, which it maintains while the pin 93 passes around the outer concentric dwell of the groove 92, this closed position being shown in Figs. 4 and 9. It will be understood that as the shutters 108 are gradually forced to their closed positions by the passage of pin 93 through the straight part 92^b (Fig. 7) of cam groove 92, the outer edges of the shutters bear first against wall 90, their proximate edges being pushed inward by plate 104. Thus the folded edges of the blank B, Fig. 13, if at any part of their length they are slightly upstanding as shown, will be forced inward to their proper position before the pressure is applied. If these shutters were omitted, and a flat plate, as 104, were forced directly against the heated wall 90, there would be a tendency to crush these edges of the blank, instead of ironing them smoothly downward. Just after the machine starts in its next cycle, *i. e.*, after a second blank has been folded, as already described, the pressing parts assume the position shown in Fig. 7, where the pin 93 is at its nearest to the axis of cam 91, and the lower shutter 108 removed from wall 90, so that the folded blank, now perfectly pressed, is free to drop from the pocket into the space between the longitudinal series of fingers 119, 126, Figs. 4 and 11, these fingers 119 and 126 and the bed 118 together forming means for receiving the blank after the final pressing operation. As the rear upturned fingers 140 of the carrier, Figs. 11 and 12, are in a plane with the fingers 119, and the board 143 of the carrier is held forward against the action of the springs 144 by the front fingers 126, the blank is also between the fingers 140 and the board 143 of the carrier and is supported by its lower edge resting on the transverse bars 139 thereof. As soon as the blank drops into this space, the roller 128 passes into the depression 127 in wheel 110, Figs. 1 and 2, when spring 133 pulls lever 129, thereby forcing inward blades 132, 134, Figs. 8 to 11, through the action of bars 131, 135 and gear connections 136, 137. These blades are adjusted on their respective carrying bars 131, 135, so that the

minimum distance between them is equal to the length of the blank, whereby one or the other of them pushes against an end of the blank and forces it to a central position with respect to the carrier.

During the third and subsequent cycles of the machine, the blanks are released from fingers 119, 126, and placed in succession on the carrier as follows: While the pressing operation is going on, as indicated in Fig. 4, cam groove 111 in wheel 110 acts through parts 112 to 117, Figs. 4 and 8, to force forward fingers 119 from their blank receiving position already described, to a position slightly in front of the fingers 126, see Fig. 3. While they remain in this position, *i. e.*, while pin 112 passes through dwell 111^a in cam groove 111, pin 121 passes into the eccentric portion of groove 120 on the outer face of wheel 110, and acts, through parts 122 to 125; first, to lower fingers 126 to the position shown in dotted lines, Fig. 8, *i. e.*, with their upper ends flush with or slightly below the face of bed 118; then to raise them to their normal, full line, position, but behind the blank. Fingers 119 then retreat to their rearward, blank-receiving position, so that the blank is now engaged between fingers 126 and the rear face of board 143, which, being continuously forced rearwardly by springs 144, has yieldingly followed the movement of fingers 119. Obviously, the following cycles of the machine will place succeeding blanks, one behind the other, on the carrier in the same manner, the carrier being withdrawable with its load from the bed 118 whenever desired by drawing it forward from between bars 139^a.

It will be understood that very many mechanical changes may be made in the various parts of the machine, and in their combinations, without departing from my invention, and that certain parts of the machine perform their functions independently of the other parts.

This application is a division of my former application for patent on folding machines, dated Aug. 3, 1910, Serial Number 575,326.

What I claim is:

1. In a folding machine, a removable carrier; means for successively depositing a series of folded and pressed blanks in juxtaposition on said carrier; and yielding means on said carrier for engaging and retaining such blanks.

2. In a folding machine, a removable carrier; means for successively depositing a series of folded and pressed blanks in longitudinally alined juxtaposition on said carrier; and yielding means on said carrier for engaging and retaining such blanks.

3. In a folding machine, a bed; a removable carrier normally supported on said bed; means for successively depositing a

series of folded and pressed blanks in juxtaposition on said carrier; and yielding means on said carrier for engaging and retaining such blanks.

5 4. In a folding machine, a bed; a removable carrier having sliding engagement with said bed; means for successively depositing a series of folded and pressed blanks in juxtaposition on said carrier; and yielding
10 means on said carrier for engaging and retaining such blanks.

5. In a folding machine, a removable carrier; and means, including two sets of fingers positively actuated to move in planes
15 one of which is substantially at a right angle with the other, for depositing a series of folded and pressed blanks in juxtaposition on said carrier.

6. In a folding machine, a removable carrier including rear and front engaging portions and means for moving said front portion toward said rear portion; and means
20 for successively depositing a series of folded and pressed blanks in juxtaposition on said carrier and between said engaging portions.

7. In a folding machine, a removable carrier including rear and front engaging portions and resilient means for forcing said front portion toward said rear portion; and
25 means for successively depositing a series of folded and pressed blanks in juxtaposition on said carrier and between said engaging portions.

8. In a folding machine, blank pressing means; a removable carrier positioned beneath said pressing means for receiving a series of blanks dropped therefrom; and means for holding such blanks in close
30 juxtaposition on said carrier so as to permit a succeeding blank to drop freely thereon.

9. In a folding machine, a removable carrier; and positively operated means adjacent said carrier for successively delivering to and longitudinally adjusting on said carrier each of a series of blanks, whereby such
35 blanks are bunched in substantially exact longitudinal and transverse alinement on said carrier.

10. In a folding machine, blank pressing means; means positioned beneath said pressing means for successively receiving a series of blanks dropped therefrom; means for moving each of such blanks longitudinally to insure their superposition; and means for
40 releasing such blanks from said receiving means; all said moving means being timed to operate in predetermined relation to said pressing means.

11. In a folding machine, blank pressing means; means positioned beneath said pressing means including two series of fingers positioned in parallel planes for successively receiving between them a series of blanks
45 dropped from said pressing means; means for moving each of such blanks longitudinally

nally to insure their superposition; and means operative through the movement of said fingers for releasing such blanks from said receiving means; all said moving means being timed to operate in predetermined relation with said pressing means. 70

12. In a folding machine, blank pressing means; means positioned beneath said pressing means for successively receiving a series of blanks dropped therefrom; means, including two parts movable toward and from each other, for moving each of said blanks longitudinally to insure their superposition; and means for releasing such blanks from said receiving means, all said moving means being timed to operate in predetermined relation with said pressing means. 75 80

13. In a folding machine, blank pressing means; a removable carrier; means positioned beneath said pressing means for successively receiving a series of blanks dropped therefrom and for positioning them on said carrier; means for moving each of such blanks longitudinally to insure their superposition; and means for releasing such
85 blanks from said receiving means. 90

14. In a folding machine, blank pressing means; a removable carrier; means positioned beneath said pressing means, including two series of fingers positioned in parallel planes, for successively receiving a series of blanks dropped from said pressing means and for positioning them on said carrier; means for moving each of said blanks longitudinally to insure their superposition; and means for releasing such blanks from said receiving means. 95 100

15. In a folding machine, blank pressing means; a removable carrier having front and rear engaging portions; means positioned beneath said pressing means, including two series of fingers, the rear series of which is substantially in the same plane with the rear engaging portion of said carrier, for successively receiving between them a series of blanks dropped from said pressing means and for positioning them on said carrier; means for moving each of said blanks longitudinally to insure their superposition; and means for releasing such blanks from said receiving means and for leaving them on said carrier. 105 110 115

16. In a folding machine, blank pressing means; means positioned beneath said pressing means for successively receiving a series of blanks dropped from said pressing means, said receiving means including two series of fingers between which series the blanks are received, means movable transversely of the planes of said series of fingers for longitudinally adjusting a blank thereon, means for forcing forward the rear series of said fingers, and means for lowering the front series of said fingers from in front of said blank and raising it at the rear of said 120 125 130

blank, whereby the blanks are successively positioned in longitudinal and transverse superposition in front of both said series of fingers.

5 17. In a folding machine, blank pressing means; a removable carrier provided with yielding means for engaging and retaining a plurality of blanks; means located beneath said pressing means for receiving a series of
10 blanks dropped therefrom and for positioning them on said carrier; and means for releasing such blanks from said receiving means.

15 18. In a folding machine, blank pressing means; a removable carrier provided with yielding means for engaging and retaining a plurality of blanks; means located beneath said pressing means and including two series of fingers in parallel planes for
20 receiving between them a series of blanks dropped from said pressing means; and means for moving said fingers to release such blanks and to position them between said yielding means on said carrier.

25 19. In a folding machine, blank pressing means; a removable carrier having front and rear blank engaging portions; means located beneath said pressing means and including two series of fingers, the rear series
30 of which is substantially in the same plane with the rear engaging portion of said carrier, for successively receiving between them a series of blanks dropped from said pressing means and for positioning them on said
35 carrier; and means for releasing such blanks from said receiving means and for leaving them on said carrier.

40 20. In a folding machine, blank pressing means; means positioned beneath said pressing means for successively receiving a series

of blanks dropped from said pressing means, said receiving means including two series of fingers maintained in parallel planes but independently movable in planes one of which is substantially at a right angle with the
45 other, between which series of fingers the blanks are received; means for forcing forward the rear series of said fingers; and means for lowering the front series of said fingers from in front of such blank and
50 raising it at the rear of such blank, whereby the blanks are successively positioned in front of both said series of fingers.

21. In a folding machine, blank pressing means operative to release a pressed blank
55 and to permit it to drop therefrom by its own weight; means located beneath said pressing means for receiving each of a series of blanks directly dropped therefrom; and means for releasing such blanks from said
60 receiving means, all said moving means being timed to operate in predetermined relation to said pressing means.

22. In a folding machine, blank pressing means operative to release a pressed blank
65 and to permit it to drop therefrom by its own weight; a removable carrier; means located beneath said pressing means and adjacent said carrier for receiving each of a series of blanks directly dropped from said
70 pressing means and for positioning it on said carrier; means for releasing such blanks from said receiving means; and means for retaining such released blanks on said carrier.

GARRY J. DORMANDY.

Witnesses:

GEO. L. COOPER,
B. H. DAVEY.