(No Model.) 3 Sheets—Sheet 1.

W. P. JACKSON.

MACHINE FOR MAKING BOOK COVERS.

No. 506,402. Patented Oct. 10, 1893.

Fig. 1.

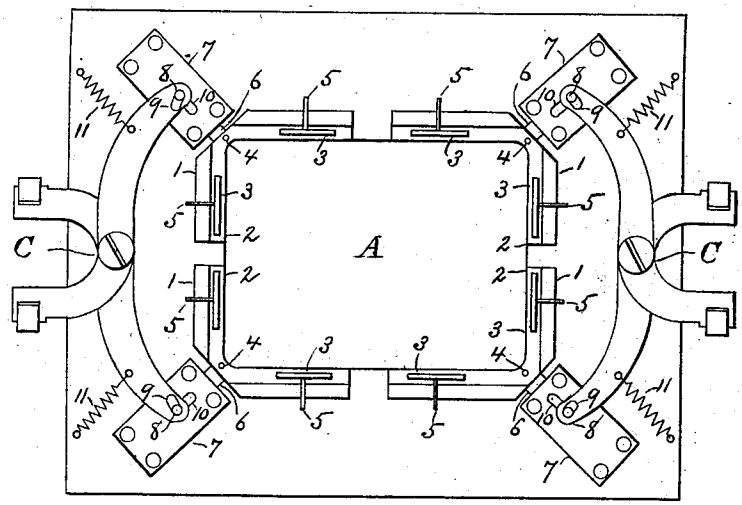


Fig. 2.

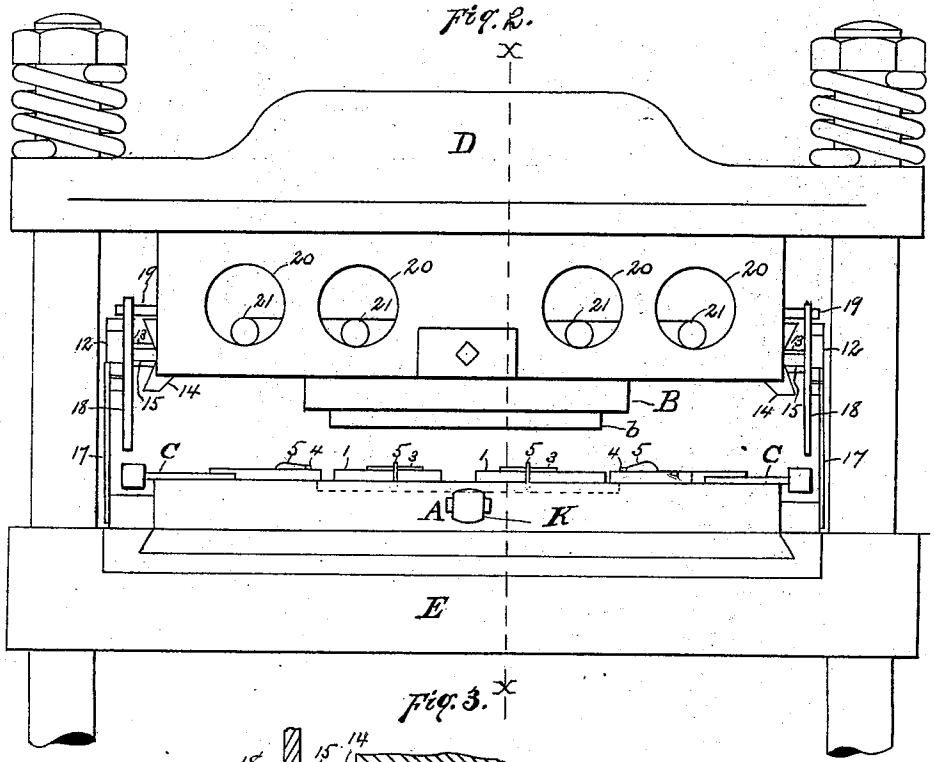
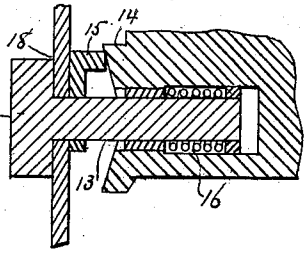


Fig. 3.



WITNESSES.

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Benjamin Phillips

(No Model.) 3 Sheets—Sheet 2.

W. P. JACKSON.

MACHINE FOR MAKING BOOK COVERS.

No. 506,402. Patented Oct. 10, 1893.

Fig. 4.

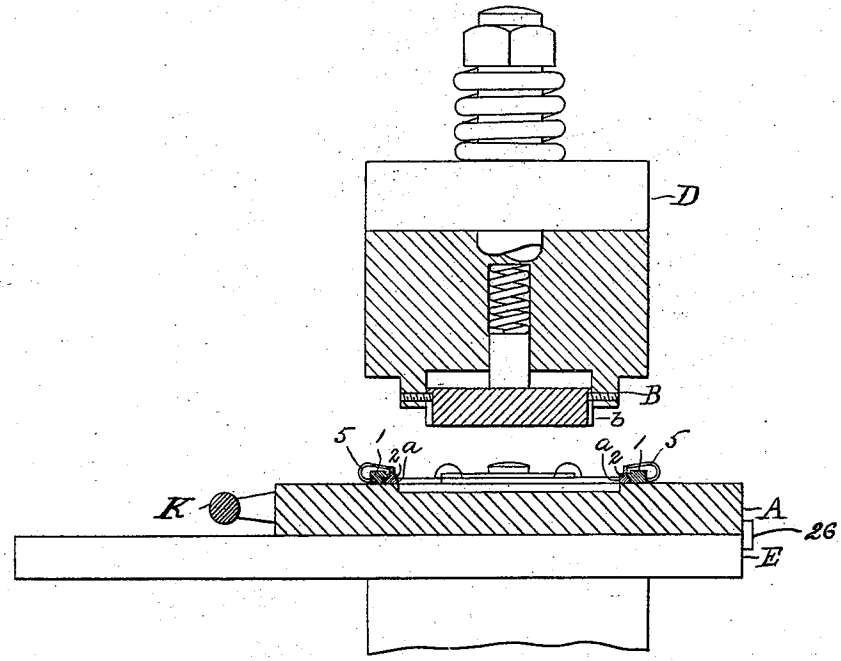


Fig. 5.

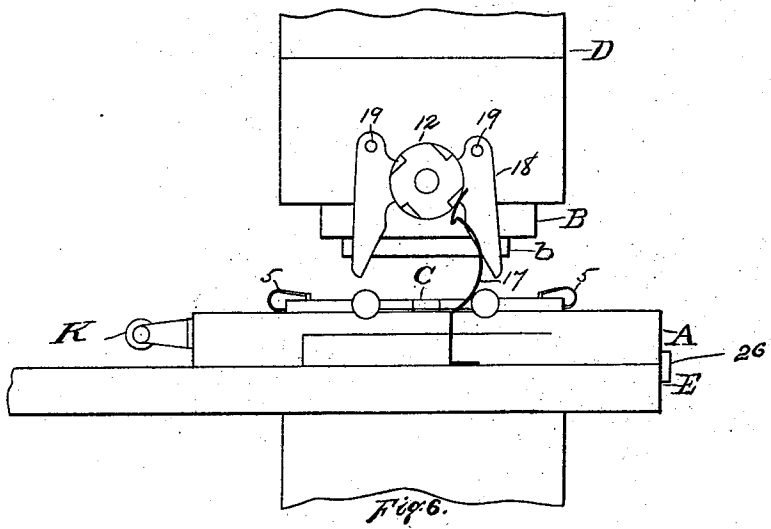
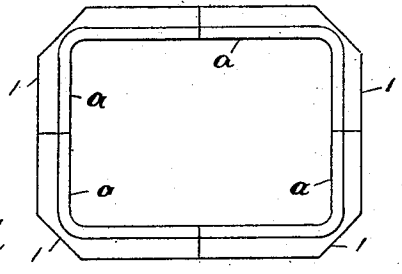


Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

W. P. JACKSON.

MACHINE FOR MAKING BOOK COVERS.

No. 506,402. Patented Oct. 10, 1893.

FIG. 7.

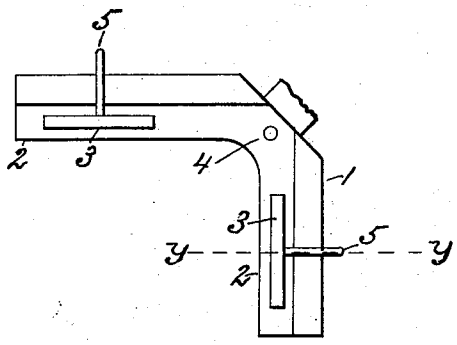


FIG. 8.

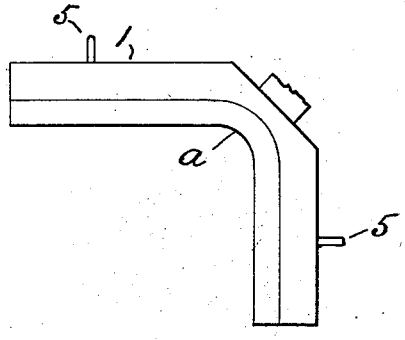
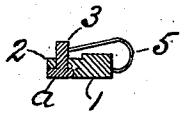


FIG. 9.



WITNESSES.

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UNITED STATES PATENT OFFICE.

WILLARD P. JACKSON, OF LYNN, MASSACHUSETTS.

MACHINE FOR MAKING BOOK-COVERS.

SPECIFICATION forming part of Letters Patent No. 506,402, dated October 10, 1893.

Application filed October 14, 1892. Serial No. 448,833. (No model.)

To all whom it may concern:

Be it known that I, WILLARD P. JACKSON, a citizen of the United States, and a resident of Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented a new and useful Improvement in Machines for Making Book-Covers, of which the following is a specification.

In the art of book making, the covers are generally formed of a flexible material such as leather, leatherette, or paper, which forms the outside cover and is folded over and united with a stiffening of card-board or other suitable material, which forms the inside cover.

My invention relates to machines for performing the operations above indicated and consists of a vertically reciprocating male former, and a female former, provided with horizontally adjustable and vertically movable folding plates; and further of mechanism which operates upon the alternate downward movement of the male former to force the folding plates inward over the female former, in position to be struck by the male former and to be forced downward into the female former, and of the devices and combinations of devices hereinafter more specifically set forth and claimed.

My invention is illustrated by the drawings herewith submitted, in which—

Figure 1 is a top view of a female former, showing folding plates. Fig. 2 is a front view of a machine embodying my invention. Fig. 3 is a sectional view of a portion of the end of the cross-head carrying the male former, illustrating the arrangement of connected mechanism for adjusting the folding plates. Fig. 4 is a section along X X Fig. 2. Fig. 5 is a partial end view. Fig. 6 is a reverse plan view of folding and guide plates, showing relative position of folding plate adjusted to receive stroke of male former. Fig. 7 is a top view of folding plate and connected guide plate showing connecting mechanism. Fig. 8 is a reverse view of same; Fig. 9, a section on line *y y*, Fig. 7.

Similar letters and figures of reference refer to similar parts throughout the several views.

Referring to the drawings, B represents the male former, which is secured to the cross-head D, to which vertically reciprocating motion may be imparted by several well known devices, which I consider it unnecessary to describe as they form no part of my invention. Immediately beneath the former B, is the female former A, mounted in a suitable table E, and movable along transverse ways on said table, so that it can be drawn out from under the male former, by means of a handle K. I also provide a suitable stop, 26, which stops the female former A immediately under the male former B when pushed back.

I have shown in the drawings a preferred form of folding plates *a a a a*, (see Figs. 4, 6, 7, 8, and 9,) in each of which an end folding plate is united with a side folding plate forming a singular angular plate *a*, but this form of folding plate, although convenient, is not an essential feature of my invention. The folding plates are rendered vertically movable and horizontally adjustable by the following described mechanism to which, however, I do not consider my invention limited.

Each of the folding plates *a*, *a*, *a*, *a*, is secured to a guide plate 1, substantially as follows: The guide plates 1, 1, 1, 1, are provided with flanges 2, 2, 2, 2; through slots cut in said flanges extend the uprights 3, 3, 3, and 4, 4, 4, 4, a convenient form and arrangement of which is shown in the drawings, Fig. 1, such arrangement giving strength to sustain pressure of the plunger or male former, as hereinafter described, and insuring a parallel vertical motion of the folding plates. To each of the uprights 3, 3, 3, is secured a spring 5, which is also secured to the guide plate 1. The action of the springs 5, 5, 5, 5, is to keep the folding plates *a*, *a*, *a*, *a*, in contact with the bottom of the flanges 2, 2, 2, 2, on the guide plates 1, 1, 1. 1, the folding plates *a*, *a*, *a*, *a*, being pressed downward against the tension of springs 5, 5, 5, 5.

The length of the folding plates *a*, *a*, *a*, *a*, is preferably such that, when carried inward, as hereinafter described, so as to clear the edges of the female former, their adjoining ends come in contact, forming a continuous band around the inside of the female former. When open, the guide and folding plates lie with reference to former A, substantially as shown in Fig. 1.

At the angle in each of the guide plates, a bolt 6 is secured, forming equal angles with the sides, the bolt 6 is adapted to slide in a grooved plate 7, secured to the former A, the groove therein forming equal angles with the sides thereof. Each of the bolts 6 carries a pin 8, extending through a slot 10 in the plate 7, and a slot 9 in an arm of a shear lever C. The shear levers C, C are pivoted to suitable supports on former A, and by the mechanism above described, the opening and closing of said levers adjust the folding plates *a*, *a*, *a*, *a*, said plates in their inward-outward motions remaining parallel to the edges of the former A. The springs 11, 11, 11, 11, secured to the blades of the levers C act to open the same when closed, as hereinafter described.

When the operation of a machine embodying my invention is described, it will be seen that it is preferable to operate the shear levers C, C, by alternate downward strokes of the former B. I find a convenient form of mechanism to accomplish this result to be to provide each end of the cross-head D with a ratchet 12, mounted on a shaft 13 extending into said cross-head, inside of which substantially as shown in Fig. 3, it is connected with a spring 16, against the tension of which it is drawn out of the cross-head D. Centrally placed around the shaft 13, and secured to the end of the cross-head D, is a double circular cam 14, the elevations and depressions in which are one hundred and eighty degrees apart. The shaft 13 carries a rigid projecting arm 15, provided with an inwardly projecting shoulder which bears against the cam 14, held in contact therewith by the action of the spring 16. Secured to former A, or to the table E, is a pawl 17, which engages with the ratchet 12 and at each reciprocation of the former B imparts a quarter turn thereto. The arm 15 being turned through ninety degrees passes from an elevation to a depression in the cam 14 or vice versa, and a horizontally reciprocating motion is thereby imparted to the shaft 13. The shaft 13 carries, loose-mounted thereon, but prevented from sliding by the ratchet 12 and arm 15, a fork 18 which slides on the pin 19, 19, secured to the cross-head D, which prevents the rotation thereof. The fork 18, when the arm 15 is in a depression in the cam 14, strikes the ends of the shear levers C, C, and the inclined surfaces thereof act to close said levers. When the arm 15 is upon an elevation on the cam 14, the fork 18 strikes by the ends of the levers C, C. Extending below the surface of the former B is a yielding plate *b*, centrally placed on former B and not of sufficient size to interfere with the operation of the folding plates. The plate *b* is brought to a solid bearing when raised flush with the surface of former B. The function of the plate *b* is to flatten out and hold the stiffening during the operation of the folding plates. The lower part of the cross head D is provided with apertures 20, 20, 20, 20, in which are introduced the gas jets 21, 21, 21, 21, by means of which the former B is kept heated for pressing as hereinafter described.

A convenient method of operating a machine embodying my invention is as follows: The former B being heated, and the fork 18 in position to strike by the ends of the levers C, the flexible material to form the outside cover, cut to the proper size, which must be larger than the female former A, is placed upon former A, and the machine set in operation; the male former B falling presses the outside cover to conform to the female former A, thereby creasing and partially turning the fold. When the former B rises, a pasted stiffening, or inside cover, is placed in the outside cover, and the former B again falling, the ratchet 12 having been given a quarter turn by the pawl 17, the fork 18 strikes the ends of the levers C, C, and closes the same, thereby closing the folding plates *a*, *a*, *a*, *a*, which turn in the fold, and the former B, falling on the uprights 3, 3,—and 4, 4,—forces the folding plates *a*, *a*, *a*, *a*, downward and presses out the fold which is united to the stiffening by adhesive material placed thereon as hereinbefore described, the plate *b* acting to hold the stiffening during the operation of the folding plates. It will be noted that the plate *b* also, by bringing the stiffening to an even surface, prevents the catching of the folding plates. The machine may be provided with suitable stopping and starting mechanism, and the former A drawn out by the handle K between the successive operations of the machine.

I am aware that horizontally acting folding plates have been used on mechanisms for similar purposes, but

I claim as my invention and desire to secure by Letters Patent—

1. In a machine for making book-covers, the combination of a vertically reciprocating male former, a female former, a series of guide plates supported in suitable bearings, a series of folding plates connected to, and horizontally movable with, the guide plates, means for imparting horizontal, parallel motion to the guide and folding plates, and means whereby the folding plates may be moved vertically in relation to the guide plates, all substantially as described.

2. In a machine for making book-covers, the combination of a vertically reciprocating male former, a female former, folding plates on the female former, means for adjusting the folding plates horizontally; means whereby the folding plates may be moved vertically, and mechanism to adjust the folding plates upon the alternate downward stroke of the male former, all substantially as described.

3. In a machine for making book-covers, the combination of a vertically reciprocating male former, a female former, a series of horizontally movable guide plates supported in suitable bearings, a series of vertically movable folding plates carried thereby, and up-

rights, mounted on the folding plates and extending above the guide plates which receive the downward stroke of the male former, and force the folding plates into the female formers, all substantially as described.

4. In a machine for making book-covers, the combination of a vertically reciprocating male former, a female former, a series of horizontally movable guide plates supported in suitable bearings, a series of vertically movable folding plates carried thereby, uprights, mounted on the folding plates and extending above the guide plates, which receive the downward stroke of the male former, and force the folding plates into the female former, and a yielding plate carried by the male former and extending below the lower surface thereof, acting to hold the material in the female former during the operation of the folding plates; all substantially as described.

5. In a machine for making book-covers, the combination of a vertically reciprocating male former, a device for heating the same, a female former, a series of horizontally movable guide plates supported in suitable bearings, a series of vertically movable folding plates carried thereby and uprights, mounted on the folding plates and extending above the guide plates, which receive the downward stroke of male former and force the folding plates into the female former; substantially as described.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, this 10th day of October, 1892.

WILLARD P. JACKSON.

Witnesses:
MAMY C. PARTRIDGE,
WILLIE C. WILMOT.