

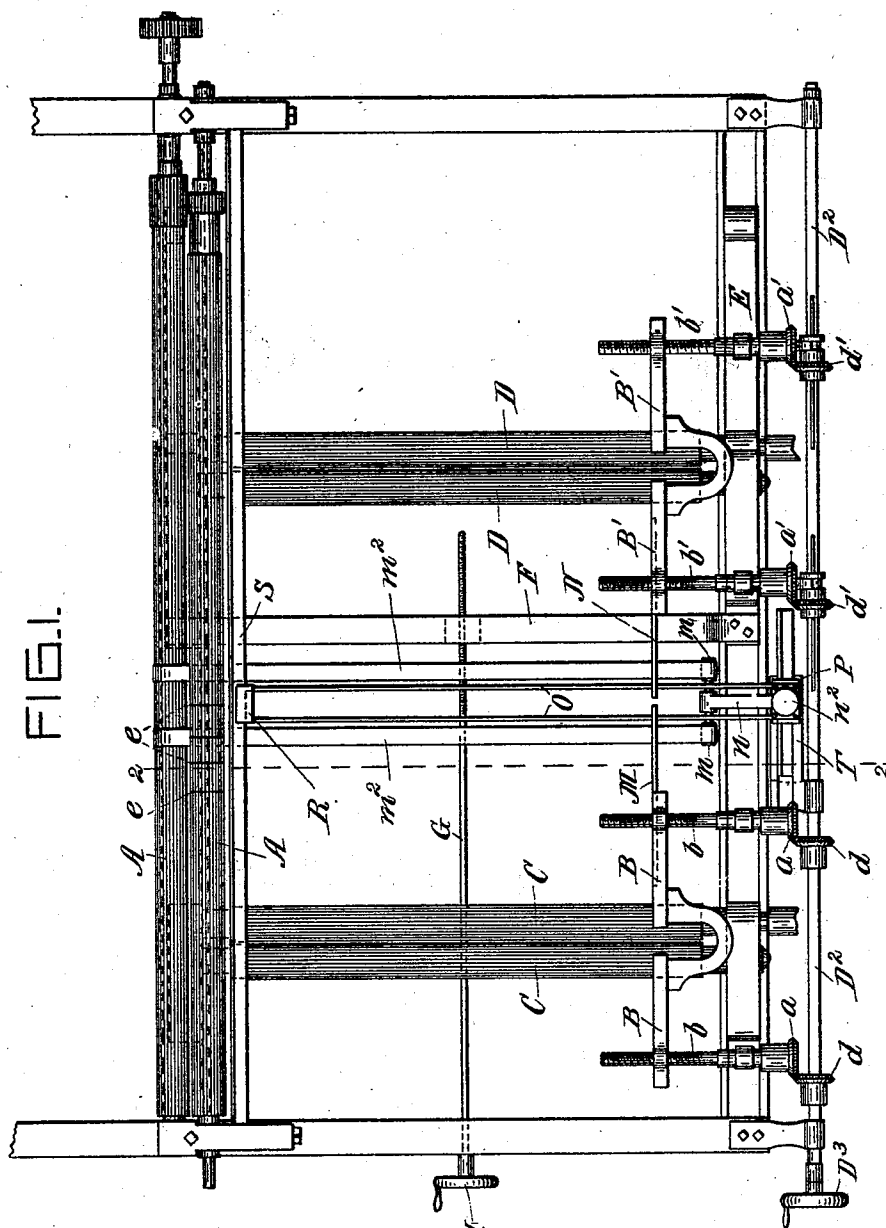
(No Model.)

2 Sheets—Sheet 1.

W. MENDHAM.
FOLDING MACHINE.

No. 517,054.

Patented Mar. 27, 1894.



Witnesses:
W. C. Jirdinston.
Harry P. McKing.

Inventor:
William Mendham
per O. M. Hill
Attorney.

(No Model.)

2 Sheets—Sheet 2.

W. MENDHAM.
FOLDING MACHINE.

No. 517,054.

Patented Mar. 27, 1894.

FIG. 2.

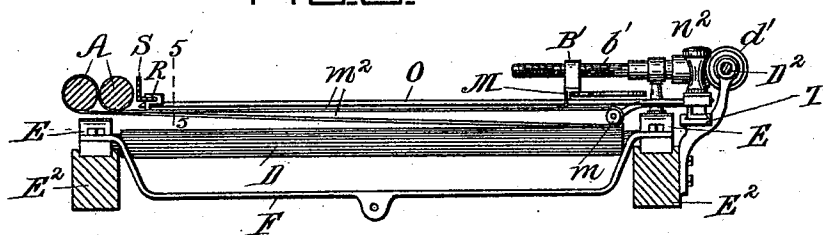


FIG. 3.

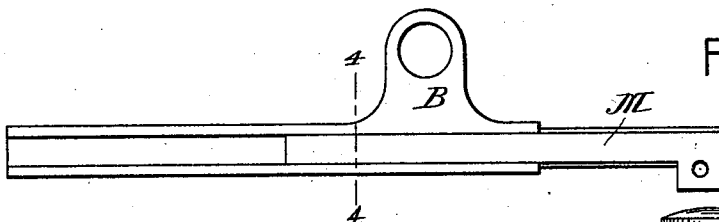


FIG. 4.

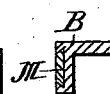


FIG. 6.

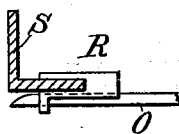


FIG. 5.

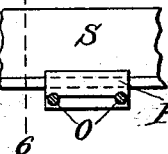


FIG. 7.

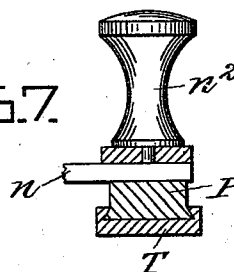
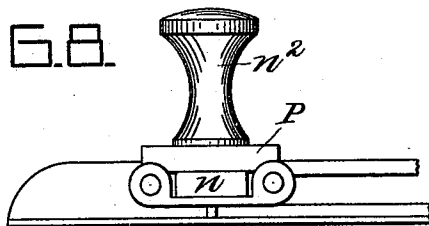


FIG. 8.



Witnesses:
W. C. Jirdinston.
Harry F. Koking.

Inventor:

William Mendham
per O. M. Hill
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM MENDHAM, OF DAYTON, OHIO, ASSIGNOR TO THE SEYBOLD MACHINE COMPANY, OF SAME PLACE.

FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 517,054, dated March 27, 1894.

Application filed March 15, 1893. Serial No. 466,051. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MENDHAM, a citizen of the United States, residing at Dayton, Montgomery county, State of Ohio, have invented certain new and useful Improvements in Folding-Machines, of which the following is a specification, reference being had to the accompanying drawings, in which similar reference letters refer to like parts throughout.

My improvements relate to that class of folding machines known to the trade as a "double sixteen - paged folder," and consists of the means hereinafter set forth and claimed for adjusting the movable folding-rollers toward or away from the stationary parallel set of rollers, and also of the means hereinafter set forth for providing an auxiliary adjustable stop-bar for each of the main stop-bars, for the purpose of bridging the space between adjacent ends of said latter stop-bars, as will presently appear.

In the accompanying drawings:—Figure 1, is a top view of the front portion of a folding machine provided with my improvements, said machine being stripped of all folding-blades, carrying-tapes and operating mechanism not pertaining to my invention, said detached portions being in no way necessary to the carrying out of my invention. Fig. 2, is a section taken across the top of the machine on dotted line 2, 2, of Fig. 1, looking toward the right hand in said latter figure. Fig. 3, is an enlarged rear view of one of the stop-bars shown in Fig. 1, with one of the auxiliary bars in position therein, and Fig. 4, is a cross-section on dotted line 4, 4, of Fig. 3. Fig. 5, is an enlarged view taken on dotted line 5, 5, of Fig. 2, looking toward left hand in said figure, and Fig. 6, is a section on dotted line 6, 6, of Fig. 5. Fig. 7, is an enlarged detail sectional view showing the preferred means for moving and adjusting the mechanism which operates the auxiliary stop-bars and carrying-tapes. Fig. 8, is a front or face view of device shown in Fig. 7.

In the drawings, A, A, represent two folding-rollers between which the sheet of paper to be folded is first creased by means of a folding-blade (not shown), said sheet being cut into two portions while being fed forward by means of a circular saw (not shown), all of

which is old and well-known. The two portions of the sheet thus cut and folded are fed forward until their folded or front edge strikes against the stop-bars B and B', at which time said portions are carried off laterally by means of carrying-tapes (not shown), each of said folded portions being again folded or creased between the folding-rollers C, C, and D, D, by means of folding-blades (not shown) in the usual manner.

The stop-bars B and B' are moved and adjusted laterally (to accommodate varying sizes of sheets to be folded) by means of the screw-rods *b, b,* and *b', b'*, journaled on the top of front frame, each of said screw-rods being provided with a beveled-gear *a, a,* and *a' a'*, which latter engage and mesh with correspondingly beveled gears *d, d,* and *d', d'*, said latter gears being mounted on shaft D³, the latter being provided with a hand-wheel, D³. To adjust said stop-bars B, B', laterally, all that is required is simply to rotate the hand-wheel, D³, in the proper direction.

The afordescribed mechanism and operations are all old and well-known, and are enumerated only for the purpose of better illustrating, in a comprehensive manner, my improvements which relate thereto.

The end portions of rollers D, D, are journaled in the strips E, E, which latter are adapted to slide in a groove in the top of frame portions E², E². The screw-rods *b', b'*, are also mounted on one of said strips, E, as shown, and in the usual manner. Heretofore, said sliding-strips E have been operated by screw-rods which were respectively right and left handed in their operation, the said screw-rods having been operated by suitable gearing at one side the machine. The great and very serious objection to this means just described for sliding the strips E and their rollers D, is that, so soon as the gearing becomes worn in the least, they will not operate to start the two screw-rods to operating simultaneously, and the consequent result is to move one of the strips, E, in advance of the strip on the opposite side. The result of starting one strip E, in advance of the opposite strip, is to throw one end of the rollers, D, forward. In order to perfectly fold a printed signature, the longitudinal face of rollers D must be at right angles with the in-

ner face of stop-bar, B'; and, if either end of said rollers be started in advance of the opposite end, they are thrown out of a right angle with said stop-bar and an imperfectly folded signature is the result.

To overcome the aforementioned objections and to insure moving both ends of the folding-rollers, D, simultaneously, I have provided the cross-bar, F, rigidly connected at each end thereof to the inner end portion of each sliding bar, E, (see Figs. 1 and 2) said cross-bar having a lug-projection *f*, with a screw-threaded opening therein, within which the screw-rod, G, operates. This screw-rod is journaled in a suitable bearing on the side top frame, and is provided on its outer end with a suitable device for rotating it, preferably a hand-wheel, H, as shown. This hand-wheel is located immediately in front of the operator: and, any rotation of the screw-rod, in either direction, will cause a corresponding sliding movement of rollers, D, through the medium of cross-bar, F, and movable bars, E, upon which said rollers are journaled.

The folding-rollers, C, C, remain stationary, in the usual manner; and, any variation in the width of the sheet to be folded and cut is provided for by adjusting the saw to operate in any one of the peripheral grooves, *e*, in one of the rollers, A, as is now commonly done in double sixteen-paged folders.

One other very serious objection to the construction of folding machines, such as those to which my invention appertains, is that, as the sheet is cut and carried forward against the inner face of the stop-bars B and B', no provision has heretofore been made for any guide or stop between the inner adjacent ends of said stop-bars, the result of which has been that the folded cut sheets, when fed forward, do not always align perfectly with the inner face of said stop-bars, the portion of each sheet, between the ends of said bars, being inclined to sag and warp. As hereinbefore stated, in order to turn out a perfectly folded signature, the sheets must be fed laterally to the rollers C, C, and D, D, at right angles thereto. In order to accomplish this, the stop-bars B and B' must be set at right angles to said rollers, and provision must be made for feeding the cut sheets evenly against said stop-bars.

To overcome the objections just noted, I provide auxiliary stop-pieces, M and N, (one for each stop-bar) which latter are adjustable longitudinally on the stop-bars B and B', and by this means I provide an approximately continuous "bridge" between the adjacent ends of said stop-bars, against which the folded paper is fed. The inner face of the stop-pieces M and N, should come flush with the inner face of the stop-bars. The stop-pieces M and N may be adjustably connected with the inner ends of stop-bars B and B', in any desired operative manner, that shown being the preferred mode. When connected as shown, the inner rear end portion of each stop-

bar is provided with a dove-tailed groove,—the outer edges of each auxiliary piece being beveled to fit and slide within said groove, as shown in Figs. 3 and 4. Two rods, O, pass respectively through the stop-pieces M and N, the front end portion of said rods is connected to block, P, and the rear end portions to block, R. The rear face of block R is provided with a horizontal groove within which one edge of the angle-iron cross-strip, S, engages, as more clearly shown in Fig. 6, and in this manner said block is adapted to slide on said strip. The block, P, has a dove-tailed connection with and is adapted to slide on plate, T. This block has a transverse opening therein within which the front end of tightening-bar, *n*, engages, and is retained therein by a set-screw, *n*², as shown in Fig. 7. This bar, *n*, is provided with lateral spindles upon which the rollers, *m*, are mounted, the latter carrying the endless tapes *m*²,—said tapes passing around the rear roller A and beneath the front roller, as shown.

The object in having the tapes *m*² mounted so that they can be moved and adjusted to different positions is to accommodate the size of sheet to be cut and folded. If a very narrow sheet is to be cut and folded, said tapes will be moved over to left hand in Fig. 1, until the desired saw-groove *e* is on a line parallel with and midway between said tapes, when the paper is cut and its separated edges are upheld and carried forward upon said tapes, in the manner presently to be described.

The operation of the features last described, is as follows: The sheet to be folded and cut is fed between the rollers, A, in the usual manner; and, as the sheet, after having been cut, is fed forward, its separated edges are carried by the tapes *m*² up to and against the stop-pieces M and N and their stop-bars,—the body portion of each separated sheet also resting on additional endless tapes (not shown) in the usual manner. It will thus be seen that the separated folded sheets are fed forward evenly and squarely against the stop-bars and their auxiliary adjustable pieces, preparatory to being fed laterally to the folding-rollers C, C, and D, D: and, being fed up evenly against said stop-bars and pieces, the sheets will be fed to said rollers at right angles thereto, thus insuring a perfectly folded signature.

To adjust the movable stop-bar B', and the auxiliary pieces M and N, to varying widths of sheets to be folded, all that is required is to loosen the set-screw *n*², and slide the blocks P and R in the desired direction according as it is desired to fold a wider or narrower sheet. As said blocks are slid in either direction, the rods O, bands *m*², rollers *m* and bar *n* are all correspondingly moved,—the continued rotation of the rollers A serving to readily adjust the tapes *m*², the latter being again tightened by pulling forward on bar *n* and then tightening the set-screw *n*².

It will be seen that the space between ad-

jacent ends of the stop-pieces M and N, is unchangeable, and that said space is very small; and, by this arrangement I am enabled to fold small signatures for pamphlets that have, heretofore, been folded by hand. The lateral movement of rods O, in the manner aforesaid, causes said stop-pieces to slide correspondingly in their stop-bars.

The advantages of my invention are obvious and apparent to those familiar with book-binding, and have been partially set forth. The facility afforded for moving both ends of the movable folding-rollers D, D, simultaneously, is a very great advantage.

The adjustable stop-pieces, M and N, between adjacent ends of the stop-bars, are quite valuable features to properly align the sheets preparatory to being folded the last time, and are also valuable in that they provide for folding small signatures.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a folding machine, the stationary folding rolls C, C, and stop-bar B, rollers D D and stop-bar B' at right angles to said rollers, the latter and stop-bar B' being mounted upon a movable frame, and screw G operating in the cross-piece F of said frame, substantially as set forth.

2. In a folding-machine, the stationary rolls C, C, and stop-bar B, rolls D, D, and stop-bar B' mounted upon a movable frame, and intermediate tapes m^2 , the latter being capable of lateral adjustment, and suitable means for moving said frame and for adjusting said tapes, substantially as set forth.

3. In combination with a folding machine

constructed substantially as set forth and having a stationary stop-bar B and a movable stop-bar B', the auxiliary stop-pieces M and N adjustably connected to said stop-bars, and suitable means for imparting a horizontal movement to said stop-pieces.

4. In a folding machine constructed substantially as set forth, the stationary stop-bar B and movable stop-bar B', said stop-bars having an adjustable stop-piece located between their adjacent end portions, the inner face of said stop-piece being on a line with the inner face of said stop-bars, for the purposes set forth.

5. In a folding machine constructed substantially as set forth and being provided with the stationary and movable stop-bars, the auxiliary stop-pieces adjustably connected to said stop-bars, rods O passing through said stop-pieces and connected to sliding blocks P and R, substantially as set forth.

6. In a folding machine constructed substantially as set forth and provided with stationary and movable stop-bars, the stop-pieces M and N adjustably connected to said stop-bars, rods O passing through said stop-pieces and connected at their end portions to the adjustable blocks P and R, bar n carrying rollers m , and endless tapes m^2 mounted on said rollers and the rear folding-roller, said bar n being adjustably connected to block P, as set forth.

WILLIAM MENDHAM.

Witnesses:

C. M. BRAAM,
W. H. EDWARDS.