

No. 820,675.

PATENTED MAY 15, 1906.

R. C. SEYMOUR.
FOLDING MACHINE.

APPLICATION FILED OCT. 25, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

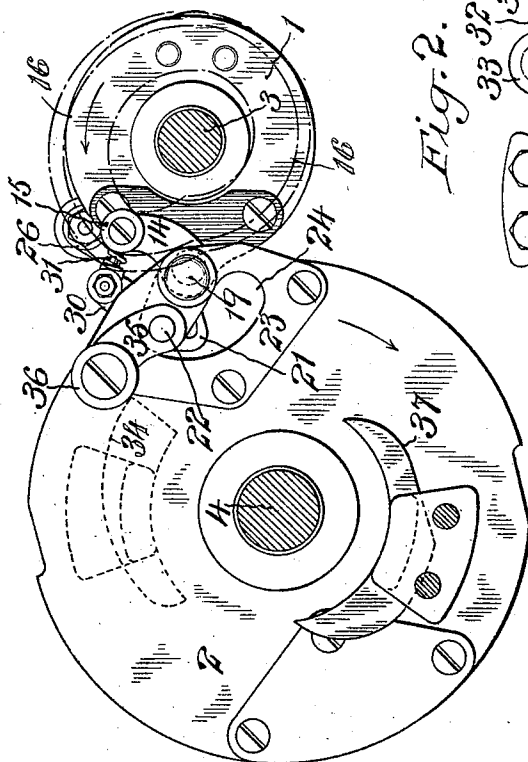
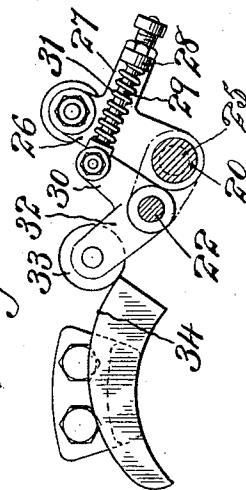


Fig. 2.



Witnesses:
F. George Barry,
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3 SHEETS—SHEET 2.

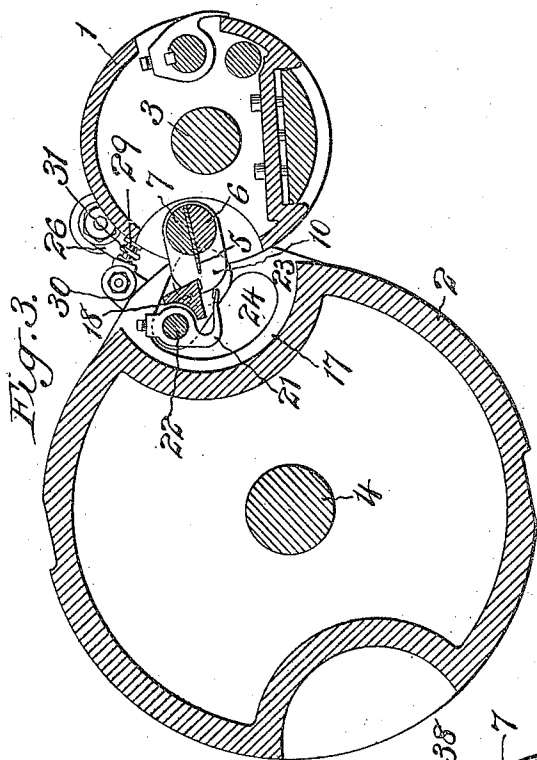
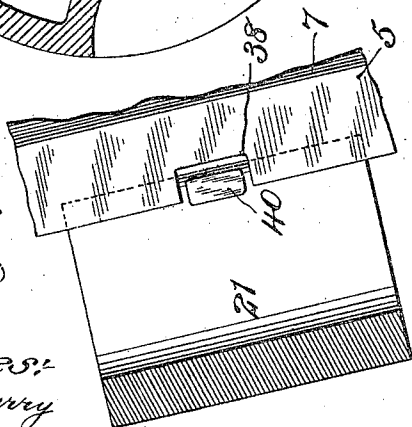


Fig. 7.



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Fig. 6.

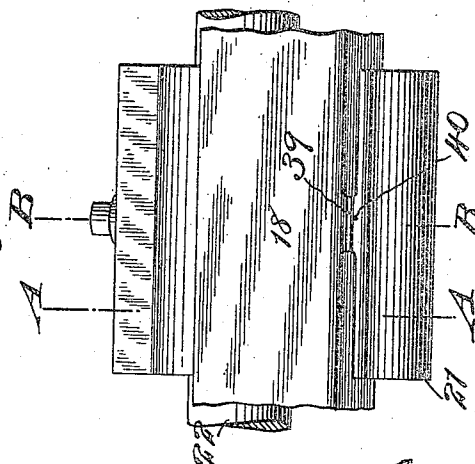


Fig. 5.

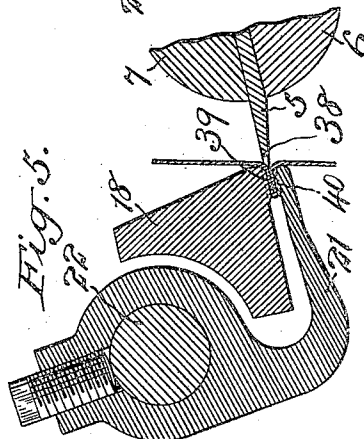
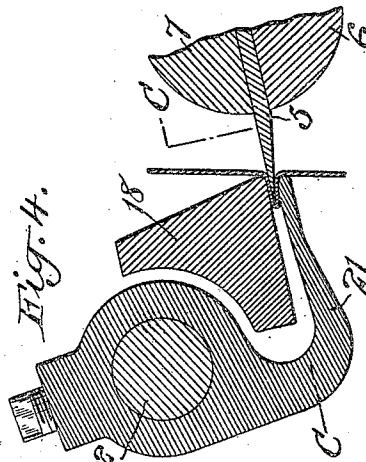


Fig. 4.



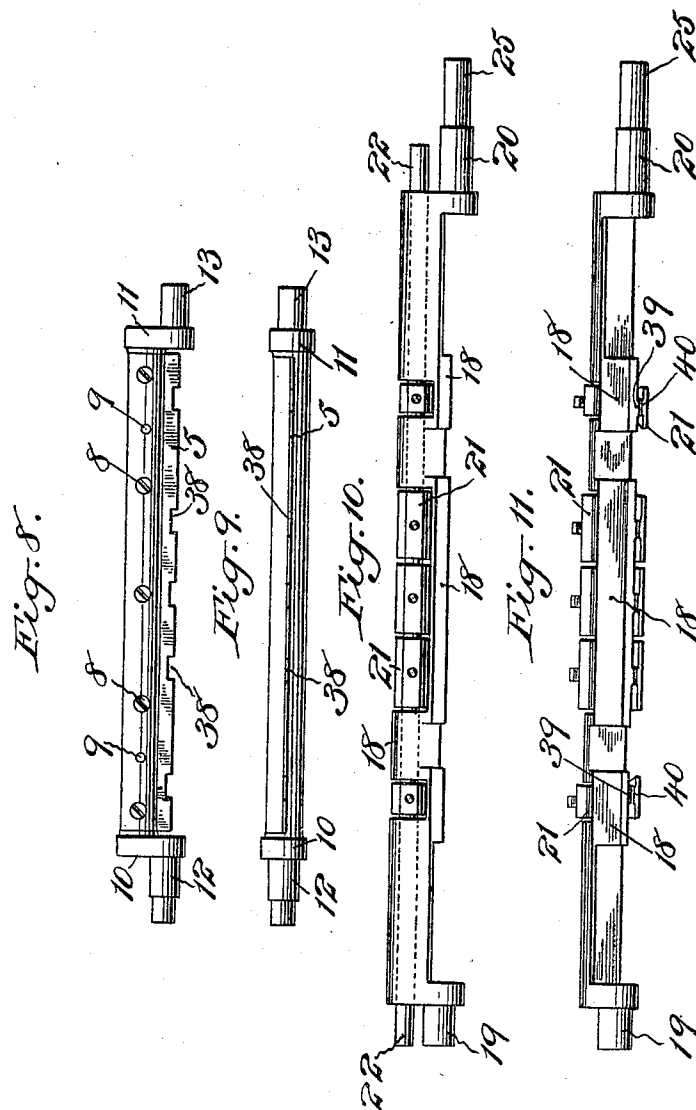
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3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

RALPH C. SEYMOUR, OF NEW YORK, N. Y., ASSIGNOR TO C. B. COTTRELL & SONS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

FOLDING-MACHINE.

No. 820,675.

Specification of Letters Patent.

Patented May 15, 1906.

Application filed October 25, 1905. Serial No. 284,298.

To all whom it may concern:

Be it known that I, RALPH C. SEYMOUR, a citizen of the United States, and a resident of the borough of Manhattan, in the city and State of New York, have invented a new and useful Improvement in Folding-Machines, of which the following is a specification.

My invention relates to folding-machines, and has more particularly for its object to provide certain novel features in sheet-folding mechanism whereby all liability of the folded sheet being prematurely withdrawn from the grippers when the grippers and tucking-blade are being separated is obviated.

A further object is to provide certain improvements in the construction, form, and arrangement of the several parts whereby the above object may be accomplished in a very simple, complete, and effective manner.

When a folding-machine is run at extremely high speeds in connection with certain grades of paper—such, for instance, as flimsy or high-calendered paper—it has been found that there is a tendency on the part of the paper to be occasionally prematurely withdrawn from the folding-grippers when the grippers and tucking-blade are being separated. This disadvantageous feature serves to necessarily keep down the speed of the folding-machine.

This present invention is directed to means which will insure the retention of the folded sheet in the folding-grippers even when the folding-machine is run at extremely high speeds until the grippers are opened for the purpose of releasing the folded sheet.

In the accompanying drawings, Figure 1 shows a part of a folding-machine for giving an understanding of the means for operating the folding mechanism. Fig. 2 is a detail view of the means for opening the folding-grippers to receive the sheet. Fig. 3 is a section through the tucking and folding cylinders, showing more clearly one form of folding mechanism with my improvements applied thereto. Fig. 4 is an enlarged detail section in the plane of the line A A of Fig. 6, showing the folding mechanism in operative position. Fig. 5 is a similar view taken in the plane of the line B B of Fig. 6. Fig. 6 is a front view of one of the folding-grippers. Fig. 7 is a section taken in the plane of the line C C of Fig. 4. Fig. 8 is a plan view of the

tucking-blade and its support. Fig. 9 is a front elevation of the same. Fig. 10 is a top plan view of a set of folding-grippers and their support, and Fig. 11 is a front view of the same.

I have chosen for the purpose of illustrating my invention folding mechanism such as that shown in my United States Letters Patent No. 668,719, entitled "Folding-machine," dated February 26, 1901; but it is to be understood that the invention might readily be applied to various other types of folding mechanism, as the invention is directed to the folding-grippers and tucking-blade only.

The tucking-cylinder is denoted by 1, the folding-cylinder by 2, and their shafts by 3 and 4, respectively.

The tucking-blade is denoted by 5, and it is secured between two half-round bars 6 and 7 by the usual screws 8 and dowel-pins 9. One of the half-round bars—for example, the bar 6—is formed integral with the end pieces 10 and 11, from which the trunnions 12 and 13 of the blade project. These trunnions 12 and 13 are pivotally supported in the tucking-cylinder 1, and one of the trunnions—as, for instance, the trunnion 12—has fixed thereto a crank-arm 14, which bears a roller 15, that travels in a grooved cam 16, as shown in dotted outline in Fig. 1, connected to the folding-machine frame.

The folding-cylinder is provided with an arc-shaped longitudinal groove 17, in which the folding-grippers are located. These grippers comprise fixed jaws 18, carrying trunnions 19 20, and movable jaws 21, fixed to a cross-shaft 22. Bearing plates or brackets 23 are provided on the folding-cylinder 2 at the opposite ends of the arc-shaped groove 17, in which plates the trunnions 19 and 20 are mounted. These plates 23 are also provided with arc-shaped slots 24. The cross-shaft 22, to which the movable jaws of the grippers are fixed, projects outwardly through the said arc-shaped slots 24 in the bearing-plates 23.

One of the trunnions of the fixed jaws 18—in the present instance the trunnion 20—is provided with an elongated portion 25, which is provided with a crank-arm 26, which is provided with a lateral extension 27, that carries a lug 28, which is perforated for the passage of a rod 29, that is carried by a crank-arm 30,

secured to the cross-shaft 22. Upon the rod 29 is a coil-spring 31, which bears at one end against the lug 28 and at its opposite end against the crank-arm 30. Normally the spring is in compression, and hence its action is to force the two arms 26 and 30 apart, and thereby close the jaws 18 and 21. The shaft 22 is further provided with another crank-arm 32, preferably made integral with the arm 30, the two forming together a bell-crank, and on the outer end of said arm 32 is mounted an antifriction-roller 33, which engages with a stationary cam-face 34, which is carried by a stationary part of the machine-frame. This mechanism is so arranged that it will open the grippers at a predetermined point for the purpose of receiving the sheet to be folded.

On the opposite end of the cross-shaft 22 is a crank-arm 35, having an antifriction-roller 36, that coöperates with a cam 37, carried by a permanent part of the machine-frame and so arranged that it will open the grippers at the proper time to release the folded sheet.

To prevent the premature withdrawal of the sheet from the folding-grippers when the grippers and tucking-blade are being separated, I provide the following arrangement: The tucking-blade 5 is provided with one or more recesses 38 in its edge, within which the jaws 18 and 21 of the grippers are caused to engage the sheet and grip the same. To facilitate the gripping of the folded sheet, I provide one or both of the jaws 18 and 21 with offset gripping-faces. In the present instance I have shown the jaw 18 as provided with an offset gripping-face 39 and the jaw 21 as provided with an offset gripping-face 40, arranged to coact with the gripping-face 39 within a recess 38 in the tucking-blade 5. It will thus be seen that the sheet may be firmly gripped after it has been folded within the folding-grippers by the tucking-blade and while the grippers and blade are being separated, thus absolutely preventing the premature withdrawal of the sheet from the folding-grippers.

It is evident that various changes might be made in the construction, form, and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the construction herein set forth; but

What I claim as my invention is—

1. A sheet-folding mechanism comprising a tucking-cylinder, its tucking-blade having a recess in its edge, a folding-cylinder and its folding-gripper arranged to grip the sheet within said recess.

2. A sheet-folding mechanism comprising a tucking-cylinder, its tucking-blade having recesses along its edge, a folding-cylinder and its folding-grippers arranged to grip the sheet within said recesses.

3. A sheet-folding mechanism comprising

a tucking-cylinder, its tucking-blade having a recess in its edge, a folding-cylinder and its folding-gripper having its jaws arranged to grip the sheet within said recess.

4. A sheet-folding mechanism comprising a tucking-cylinder, its tucking-blade having recesses along its edge, a folding-cylinder and its folding-grippers having their jaws arranged to grip the sheet within said recesses.

5. A sheet-folding mechanism comprising a tucking-cylinder, its tucking-blade having a recess in its edge, a folding-cylinder and its folding-gripper having its jaws arranged to grip the sheet within said recess, one of the jaws having an offset gripping-face.

6. A sheet-folding mechanism comprising a tucking-cylinder, its tucking-blade having recesses along its edge, a folding-cylinder and its folding-grippers having their jaws arranged to grip the sheet within said recesses, one of the jaws of each gripper having an offset gripping-face.

7. A sheet-folding mechanism comprising a tucking-cylinder, its tucking-blade having a recess in its edge, a folding-cylinder and its folding-gripper having its jaws arranged to grip the sheet within said recess, both of the jaws having offset gripping-faces.

8. A sheet-folding mechanism comprising a tucking-cylinder, its tucking-blade having recesses along its edge, a folding-cylinder and its folding-grippers having their jaws arranged to grip the sheet within said recesses, both of the jaws of each gripper having offset gripping-faces.

9. A sheet-folding mechanism comprising a tucking-cylinder, its tucking-blade having a recess in its edge, a folding-cylinder and its folding-gripper having its jaws arranged to grip the sheet within the recess while the blade and gripper are being separated and means for controlling the operation of the gripper-jaws.

10. A sheet-folding mechanism comprising a tucking-cylinder, its tucking-blade having recesses along its edge, a folding-cylinder and its folding-grippers having their jaws arranged to grip the sheet within the recesses while the blade and gripper are being separated and means for controlling the operation of the jaws of the grippers.

11. A sheet-folding mechanism comprising a tucking-blade having a recess in its edge, a folding-gripper having its jaws arranged to grip the sheet within the recess while the blade is being withdrawn from the gripper, means for controlling the opening and closing of the gripper-jaws and means for controlling the movement of the tucking-blade.

12. A sheet-folding mechanism comprising a tucking-blade having recesses along its edge, folding-grippers having their jaws arranged to grip the sheet within the recesses while the blade is being withdrawn from the grippers, means for controlling the opening

and closing of the jaws of the grippers and means for controlling the movements of the tucking-blade.

13. A sheet-folding mechanism comprising
5 a tucking-blade having a recess in its edge, a folding-gripper, means for opening the gripper to receive the sheet, means for closing the gripper to cause it to grip the sheet within the recess in the tucking-blade, means for advancing the tucking-blade into the gripper,
10 said means being arranged to withdraw the blade while the sheet is engaged by the gripper and means for opening the gripper to release the folded sheet.

14. A sheet-folding mechanism comprising
15 a tucking-blade having recesses along its edge, folding-grippers, means for opening the

grippers to receive the sheet, means for closing the grippers to cause them to grip the sheet within the recesses in the tucking-blade,
20 means for advancing the tucking-blade into the grippers, said means being arranged to withdraw the blade while the sheet is engaged by the grippers and means for opening the grippers to release the folded sheet.

25 In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 19th day of October, 1905.

RALPH C. SEYMOUR.

Witnesses:

F. GEORGE BARRY,
FREDK. HAYNES.