

R. C. SEYMOUR.
ASSOCIATING AND BINDING MACHINE.
APPLICATION FILED JULY 10, 1909.

1,011,864.

Patented Dec. 12, 1911.

5 SHEETS—SHEET 1.

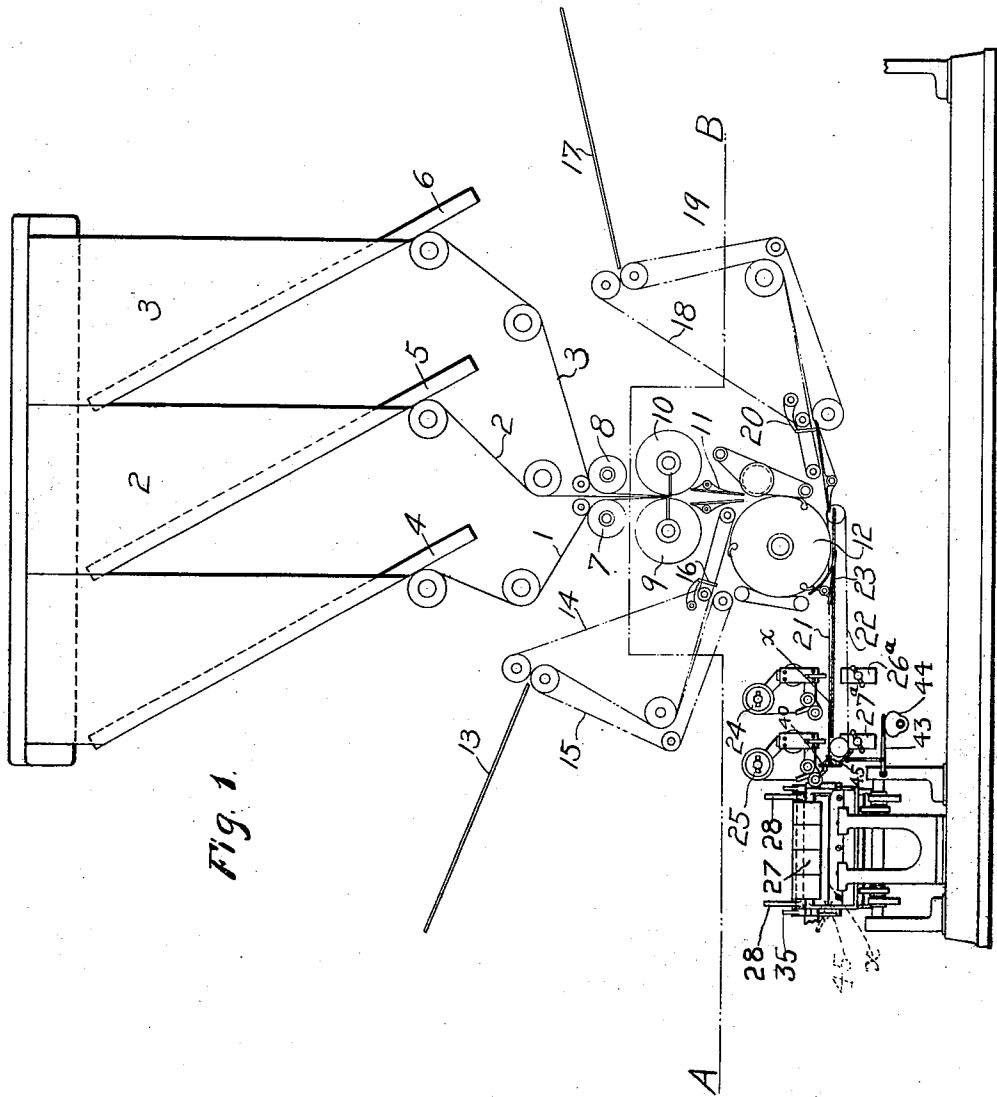


Fig. 1.

Witnesses:
Wm J. Chapman
R. Menck

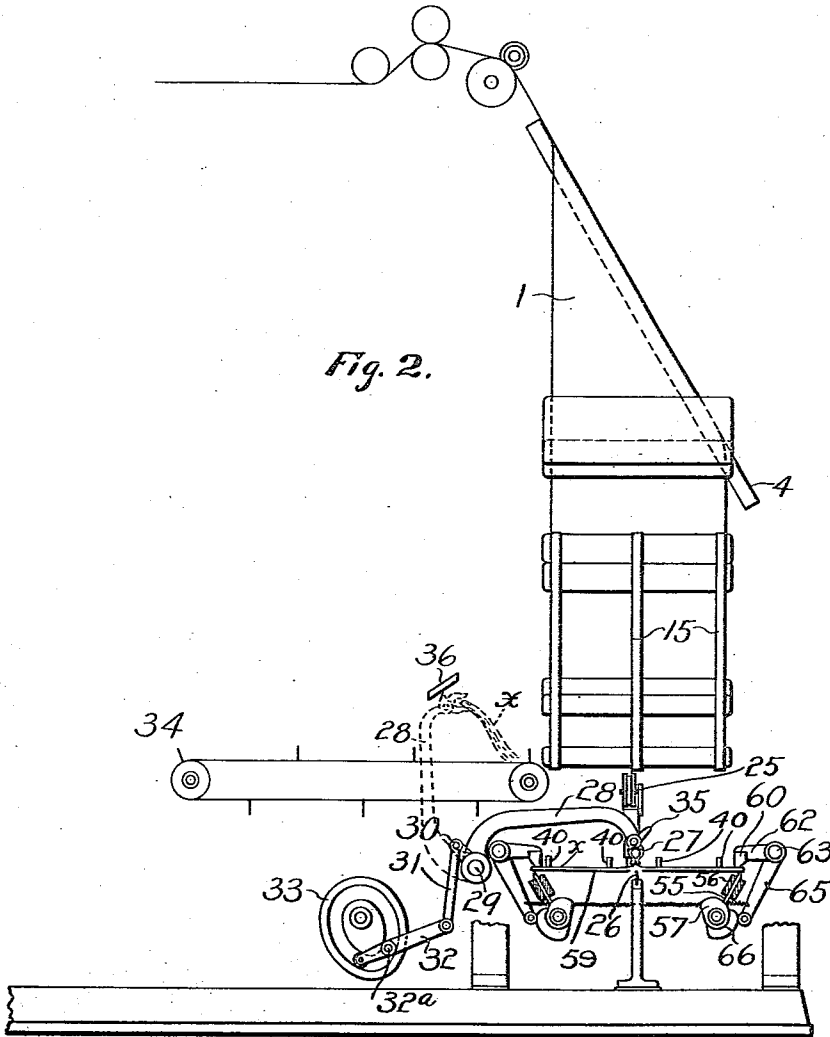
Ralph C. Seymour
Inventor
John D. Morgan
By his Attorney

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R. Menck

Ralph C. Seymour
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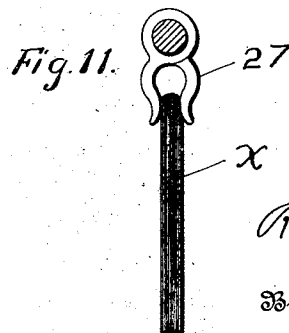
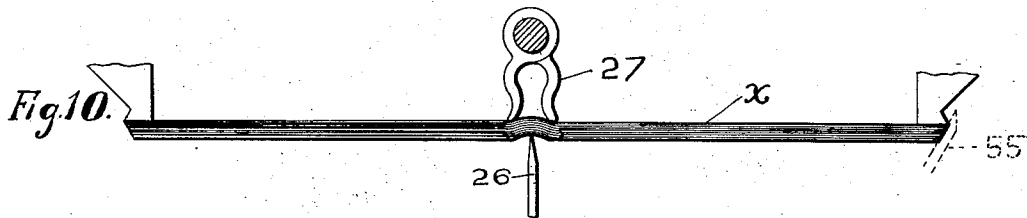
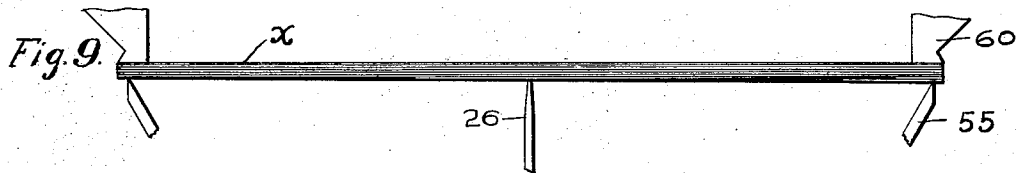
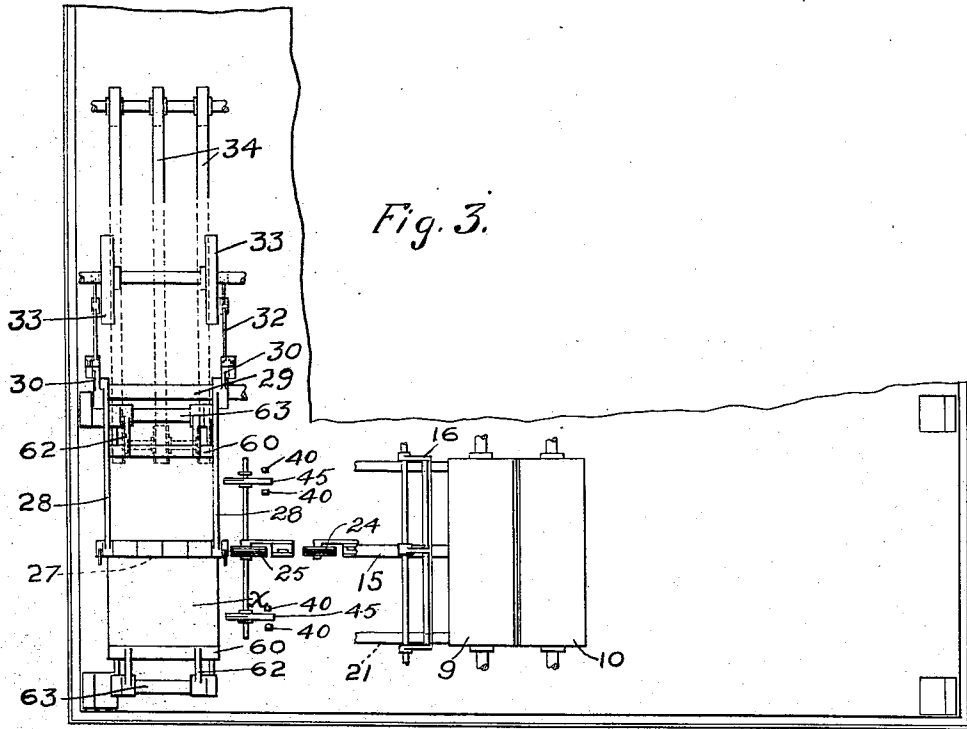
By his Attorney John Morgan

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5 SHEETS—SHEET 3.



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5 SHEETS—SHEET 4.

Fig. 4.

47

48

49

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44

22

X

Fig. 2 is a schematic diagram of a mechanical assembly, likely a printing press component. It shows a vertical frame with two horizontal bars (45) and two sets of rollers (50, 51, 52). A vertical rod (46) passes through the rollers. A horizontal bar (47) is at the top, and a vertical rod (72) is at the bottom. A large rectangular block (X) is on the right.

Witnesses:
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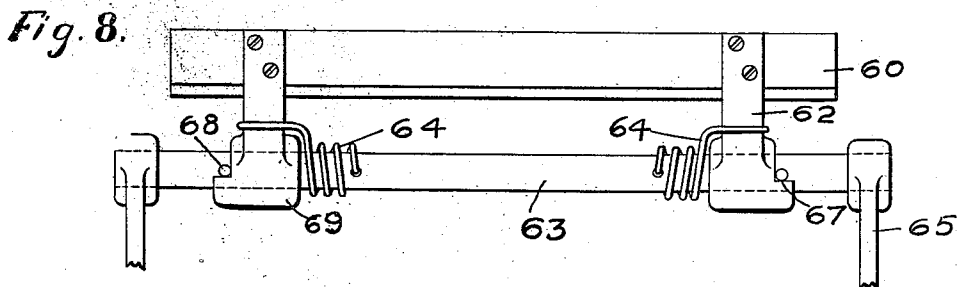
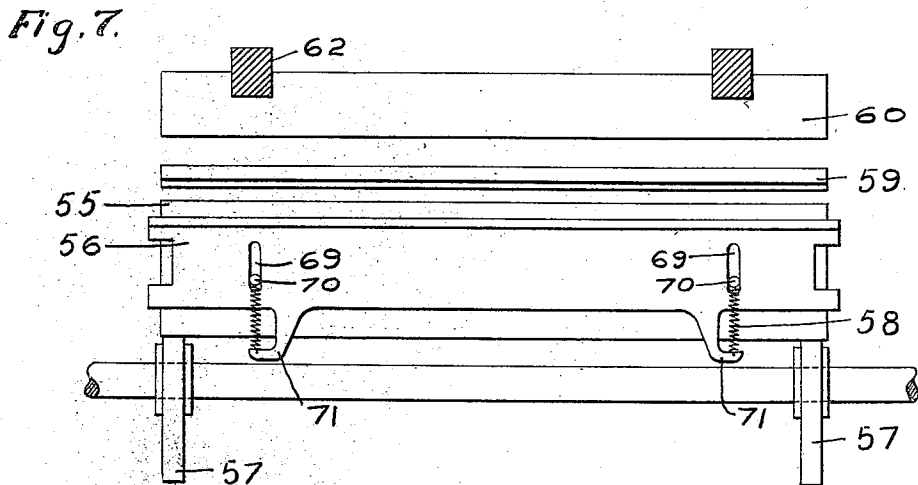
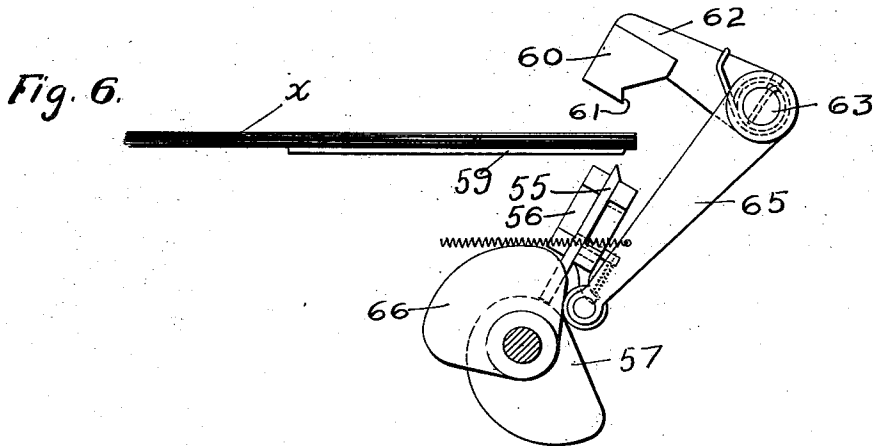
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By his Attorney *John D Morgan*

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5 SHEETS—SHEET 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

RALPH C. SEYMOUR, OF LARCHMONT, NEW YORK, ASSIGNOR TO GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ASSOCIATING AND BINDING MACHINE.

1,011,864.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed July 10, 1909. Serial No. 506,956.

To all whom it may concern:

Be it known that I, RALPH C. SEYMOUR, a citizen of the United States, and residing at Larchmont, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Associating and Binding Machines, of which the following is a specification.

The invention relates to machines for associating, binding and folding a plurality of sheets into a book, although certain of its features are useful in other connections.

Objects of the invention are to provide for associating a plurality of sheets together with either or both a cover and an insert and to make them into a book of neat appearance and to perform the necessary operations with great rapidity; to provide for performing the various operations of making the books carefully and precisely but in such a relation to each other as to conduce to rapid production and a large product; to provide a novel and useful relative arrangement of mechanism for successively acting on the sheets to make the book; to provide for exact and speedy control of the sheets at and between the binding and folding positions; to provide novel trimming devices and a novel method of trimming and handling the associated sheets. These and other objects of the invention will in part be obvious and will in part more fully appear hereinafter.

The invention consists in the novel methods, parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and forming a part hereof, illustrate one embodiment of the invention, the same serving in connection with the description herein to explain the principles of the invention.

Of the drawings: Figure 1 is an elevation of a machine constructed in part in accordance with the principles of the invention; Fig. 2 is an end elevation looking at Fig. 1 from the left; Fig. 3 is a horizontal section on the line A—B of Fig. 1; Figs. 4 and 5 are details of certain sheet handling devices; Figs. 6, 7 and 8 are details of the sheet trimming devices; and Figs. 9 to 11, inclusive, are views showing somewhat diagrammatically the trimming and folding of a book.

Referring to the accompanying drawings,

illustrating by way of example one embodiment of the invention, suitable means for associating a plurality of sheets are shown. The illustrated form thereof is adapted to operate upon a plurality of webs, or the various parts of a slit web. Three webs, or sections of web, indicated respectively by the numerals 1, 2 and 3 are shown directed into the machine and passing respectively over the turner bars 4, 5 and 6. In the present instance the webs are first associated and then cut. The webs are associated by being run between the rollers 7 and 8, or in any other suitable or convenient manner. Suitable sheet-forming devices are provided, and the form thereof herein illustrated comprises rotary cutters 9 and 10. The bundle or stack of sheets is then directed forward by suitable means, the illustrated form thereof comprising guide or throat bars 11.

According to certain features of the invention, means are provided for supplying to the bundle of associated sheets either a cover, or an insert, or both. Accordingly in the illustrated embodiment a form of such means is provided. As the sheets pass along they are engaged by suitable grippers upon a cylinder 12 and may be supplied at this point with a cover. So far as concerns many features of the invention, the cover feeding means may be of any suitable and convenient form, and it is shown herein as comprising a feed board 13, sets of conveying tapes 14 and 15, and a suitable stop gate or front gate 16. These parts cooperate in a well-known manner to feed a cover to the cylinder 12, which is taken by the grippers upon the cylinder and is associated thereon with the sheets.

The form of insert supplying means here-with shown comprises a feed board 17, sets of tapes 18 and 19 and a stop gate or front gate 20, which cooperate in a manner which will be well understood to supply the inserts to the opposite side of the sheet bundle or stack from the cover when both are run at the same time. In one form of the invention the insert is not fed to the cylinder, but direct to the pathway to the mechanism for the subsequent operations. In the illustrated embodiment, therefore, the tapes 18 and 19 the gate 20 are shown feeding the insert to the tapes 21 and 22. This obviates taking the insert upon the cylinder 12, and thus there is no need for a corresponding

gripper movement. The risk of non-registration of the insert with the sheets upon the cylinder is likewise avoided. In the present machine the insert and the sheet bundle are conveyed along by the tapes 21 and 22 and are brought independently to register against the stop 40. While so registered they may be accurately held and then stitched together. It will be understood, however, so far as concerns many features of the invention, both the cover and insert, or either or neither of them may be run with the associated sheets as desired. If desired the cylinder 12 may be used as a collecting cylinder by suitable arrangement and operation of the grippers, and the switch or stripper 23 may be used or thrown out of operation according to the way in which the mechanism is being used. The sheets are then conveyed along a path by suitable conveying means, such as sets of tapes 21 and 22, the path of travel of the sheet being shown horizontally arranged.

In the present embodiment means are provided for binding, trimming and folding the associated sheets, said means being arranged along the path of travel of the sheets. So far as concerns certain aspects of the invention certain of these mechanisms might be omitted or certain other mechanisms provided. According to one feature of the invention means are provided for binding the sheets in a longitudinal direction as referred to their path of travel. Accordingly a form of such means is shown herein comprising stitchers 24 and 25 with coöperating anvils 26^a and 27^a.

The form of folding means herein shown is constructed and arranged to deliver the sheets at one side of their path of travel and, according to one feature of the invention, to fold them in a direction longitudinal of said path of travel. The particular form of folding means shown includes a folding blade 26 and folding jaws 27 which engage the sheets to fold them over the blade and then carry them away for delivery. The folding jaws 27, if desired, may be spring pressed to hold them normally in closed position in a well-known manner. For movement between folding and delivering position they are shown mounted on arms 28 fixed to a rock shaft 29. Suitable actuating devices for each arm 28 are provided, such as an arm 30, link 31 and lever 32, said lever being pivoted at 32^a operatively connected with a cam 33.

Delivery devices of suitable and convenient form are provided, and the illustrated form thereof comprises a pocket delivery 34 shown herein arranged at one side of, and also above, the path of travel of the sheets. Suitable means for causing the jaws to deliver the sheets are provided, and the form thereof shown in the drawings comprises a trip arm 35 and a suitable tripping cam 36.

in accordance with certain features of the invention, means for stopping the sheets in position for binding are provided and also means for conveying them positively from a binding to a folding position, that is, means which engage the sheets positively and control their movement accurately as distinguished from means whose action upon the sheet is indeterminate, such as devices acting only on the outer sheets and depending on the adhesion between the sheets of the bundle to keep them together. According to one feature of the invention also, means for stopping and positioning the sheets for binding acting independently of said means for conveying them from the binding to the folding position are provided. By such an arrangement a second bundle or group of sheets may immediately be positioned for binding without waiting for the conveying devices to return from folding position, nor is it necessary for the folding devices to remain at rest at the binding position during the binding operation. The speed of the machine, as will be clearly understood, is thereby greatly increased. In the embodied form of these features of the invention, a gate or gage 40 is shown movable into and out of the path of travel of the sheets. The gate is suitably located with respect to the binding mechanism to present the sheet bundle in proper binding position when it is brought to rest against the gate. Said gate is shown mounted upon swinging arms 41, connected by pivoted links 42 to lever arms 43, acted upon by a suitable cam 44. A set of traveling grippers 45 is shown reciprocable between the binding and folding positions. These grip or clamp the sheet bundle firmly at the binding position and carry it to, and bring it to rest in proper position with respect to, the folding devices. Said grippers are shown mounted upon a supporting bar or cross-head 46, sliding on ways 72, and connected by pivoted links 47 to levers 48, in operative relation with a cam 49. Suitable means for controlling the opening and closing action of these grippers may be provided at both the binding and folding positions if desired, and they may be generally of the form already shown and described in connection with the folding jaws. Springs 50 are shown pressing the jaws together, and trip fingers 51 and 52 which coact with cam pieces 53 and 54 to open the jaws against their springs may be provided.

The invention in one of its aspects provides means for trimming the edges of the book in such a manner that notwithstanding the sheets are of equal width and are folded one within the other successively, the edge of the folded book opposite the back will be substantially straight or uniform. According to one feature of the invention, the trimming means acts upon the sheets pre-

vious to their being folded and in accordance with a further feature of the invention said means act to trim the sheets at the folding position and without any stoppage of the folding mechanism. The trimming means is shown, accordingly, constructed and arranged to trim the edges of the extended or unfolded sheets obliquely or slantingly. Thus the inner sheets are cut just sufficiently smaller than the outer to compensate for the thickness of the successive unfolded sheets and so to present a straight edge after the fold is made. The illustrated form of such means shown herein comprises blades or shears 55 traveling in suitable blocks or guides 56. These may be arranged, if desired, with slots 69 in which travel pins 70 on the blades. The blades may be acted on by cams 57 to which they are held by springs 58, shown herein between the pins 70 and lugs 71 on the guides 56. The blades or cutters 55 move obliquely relatively to the plane of the sheets, and may work along the edges of a suitable support or table 59. Suitable means are provided for clamping or otherwise holding the edges of the sheets firmly in position during the trimming operation. The illustrated form thereof comprises clamping bars 60 for closing down upon the sheets, and moving away after the trimming operation to free them for delivery. The bars 60 may be provided with a beveled edge 61, if desired, to aid in giving a clean cut during the trimming. The clamps 60 are shown mounted upon swinging arms 62, connected to the shaft 63. The shaft 63 is shown having fixed thereto an arm 65 in operative relation with a cam 66. If desired a yielding clamping action may be secured. A form of means for effecting this is accordingly provided. The form thereof shown comprises collars 69 fixed to the arms 62 and loosely mounted on shaft 63. Collars 69 are provided with lugs 67 in alinement with stops 68 on shaft 63, against which they are impelled by springs 64.

The manner of operation of the herein-described mechanism is substantially as follows: The slit web or webs are run over the turner bars 4, 5 and 6 and are associated between the rolls 7 and 8 and are severed into bundles or stacks of sheets by the rotary cutters 9 and 10. They are then directed to the throat 11 to the cylinder 12. If a cover is to be supplied it will be released in proper relation by the gate 16 and taken up by the cylinder. The insert, when run, will also be supplied upon the opposite side of the sheet bundle by the mechanisms already described. After one or more revolutions of the cylinder 1, and with or without either the cover or insert, or both, the sheets are then conveyed along the path by the tapes 21 and 22, and are brought to rest in position for binding by the stop gate 40.

They are then operated upon by the stitchers 24 and 25 which bind them together. The grippers 45 are reciprocated to and fro along their path of travel and grip the sheets while positioned against the gate 40. The gate 40 is then swung downwardly and the gripped sheets are conveyed along their path and brought to rest in position over the folding blade 26 by the grippers 45. The clamps 60 close down upon the edges of the sheet and press them against the table or support 59 and the blades 55 move upward obliquely and trim off the edges of the sheets. The folding jaws, swinging downwardly with their arms 28, fold the sheets over the blade 26 and the sheets, having been released by the clamps 60 and the grippers 45, are swung upwardly in the bite of the folding jaws to position above the folding pockets 34. The jaws are now opened by the action of the trip 36 upon the finger 35 and the book falls into the pocket upon the conveyor 34.

From all the foregoing it will be understood that a machine has been provided embodying and illustrating the principles of the invention and realizing the objects of invention and the advantages herein set forth, together with other objects and advantages.

The invention, in its broader aspects, is not limited to the particular constructions shown, nor to any particular constructions by which it has been or may be carried into effect, as many changes may be made in the construction without departing from the main principles of the invention and without sacrificing its chief advantages.

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

1. An associating and binding machine including in combination means for associating printed sheets, means for binding the sheets together, means for trimming edges of the book, and means for folding the book after it is trimmed.

2. An associating and binding machine including in combination means for associating printed sheets, means for binding them together, means for trimming edges of the sheets at a bevel, and means for folding the bound and trimmed sheets.

3. An associating and binding machine including in combination means for associating a plurality of sheets, means for trimming edges thereof at a bevel, and means for folding the sheets with the smaller sheet inward.

4. An associating and binding machine including in combination means for associating a plurality of sheets, means for stitching the sheets together, means for trimming edges of the stitched sheets, and means for delivering the sheets upwardly after they are trimmed.

5. An associating and binding machine including in combination means for associating a plurality of sheets, means for trimming edges of the sheets, and means for
5 folding and delivering the sheets upwardly after they are trimmed.
6. An associating and binding machine including in combination means for feeding sheets, separate means for feeding a cover,
10 means for associating the printed sheets and separately fed cover, means for binding the sheets and cover together, and means for trimming edges of the stitched sheets and cover.
- 15 7. An associating and binding machine including in combination means for associating printed sheets and a separately fed cover, means for binding the sheets and cover together, means for trimming the
20 edges of the book and means for folding the book after it is trimmed.
8. An associating and binding machine including in combination means for associating printed sheets and a separately fed cover
25 sheet, means for binding them together, means for trimming the edges of the bound sheets at a bevel, and means for folding the bound and trimmed sheets.
9. An associating and binding machine including in combination means for associating a plurality of sheets, means for trimming two opposite edges of the associated
30 sheets at a bevel, and means for folding said associated sheets between and parallel
35 to said trimmed edges.
10. An associating and binding machine including in combination means for associating a plurality of sheets, means for trimming two opposite edges of the associated
40 sheets at a bevel, in oppositely inclined directions, and means for folding said associated sheets between and parallel to said trimmed edges with the smaller sheets within, whereby said trimmed edges are brought
45 together to form a straight edge opposite the fold.
11. An associating and binding machine including in combination means for associating a plurality of sheets, means for binding the sheets together, means for simultaneously clamping two opposed edges of the
50 associated and bound sheets, and means for trimming said edges while so clamped.
12. An associating and binding machine including in combination means for associating a plurality of sheets, means for binding the sheets together, means for simultaneously clamping two opposed edges of the
60 associated and bound sheets, and means for trimming at a bevel in diverging directions said edges while so clamped.
13. An associating and binding machine including in combination means for associating a plurality of sheets, means for simultaneously clamping two opposed edges of the
65 associated sheets, means for trimming said edges while so clamped, and means for folding the sheets after they are trimmed.
14. An associating and binding machine including in combination means for associating a plurality of sheets, means for supporting said sheets in a horizontal position,
70 means for trimming two opposed edges of said sheets at a bevel in divergent directions, and means acting from above to fold said sheets parallel to said trimmed edges and
75 to deliver them upwardly.
15. An associating and binding machine including in combination means for associating a plurality of sheets, means for supporting said sheets in a horizontal position,
80 means for trimming two opposed edges of said sheets, and means acting from above to fold said sheets and to deliver them upwardly.
16. An associating and binding machine including in combination means for associating a plurality of sheets, means for conveying the assembled sheets along a path,
85 means for binding the sheets together, means for arresting the sheets and means at the side of said path for trimming the side edges of said associated, bound and arrested sheets.
17. An associating and binding machine including in combination means for associating a plurality of sheets, means for conveying the assembled sheet along a path,
90 means for binding the sheets together, means for arresting the sheets and means at the side of said path for trimming the side edges
95 of said associated, bound and arrested sheets at a bevel in diverging directions whereby the successive sheets will vary in width from one face of the sheet bundle to the other.
18. An associating and binding machine including in combination means for associating a plurality of sheets, means for conveying the assembled sheet along a path,
100 means for arresting the sheets, means at the side of said path for trimming the side edges
105 of said associated and arrested sheets at a bevel in diverging directions whereby the successive sheets will vary in width from one face of the sheet bundle to the other
110 and means for folding the arrested and trimmed sheets parallel to said trimmed edges.
19. An associating and binding machine including in combination means for associating a plurality of sheets, means for progressing said associated sheets along a path,
120 means for arresting said sheets in position for stitching, means for stitching the arrested and positioned sheets together at a plurality of points in line with each other,
125 means for trimming the two edges of the stitched sheets which are parallel to the line of stitches and means for folding the sheets along said line of stitches.
20. An associating and binding machine 130

including in combination means for associ-
ating a plurality of sheets, means for pro-
gressing said associated sheets along a path,
means for arresting said sheets in position
5 for stitching, means for stitching the arrest-
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10 stitches at a bevel and in divergent direc-

tions, and means for folding the sheets along
said line of stitches.

In testimony whereof, I have signed my
name to this specification, in the presence of
two subscribing witnesses.

RALPH C. SEYMOUR.

Witnesses:

JOHN D. MORGAN,
S. J. GENSLE.