

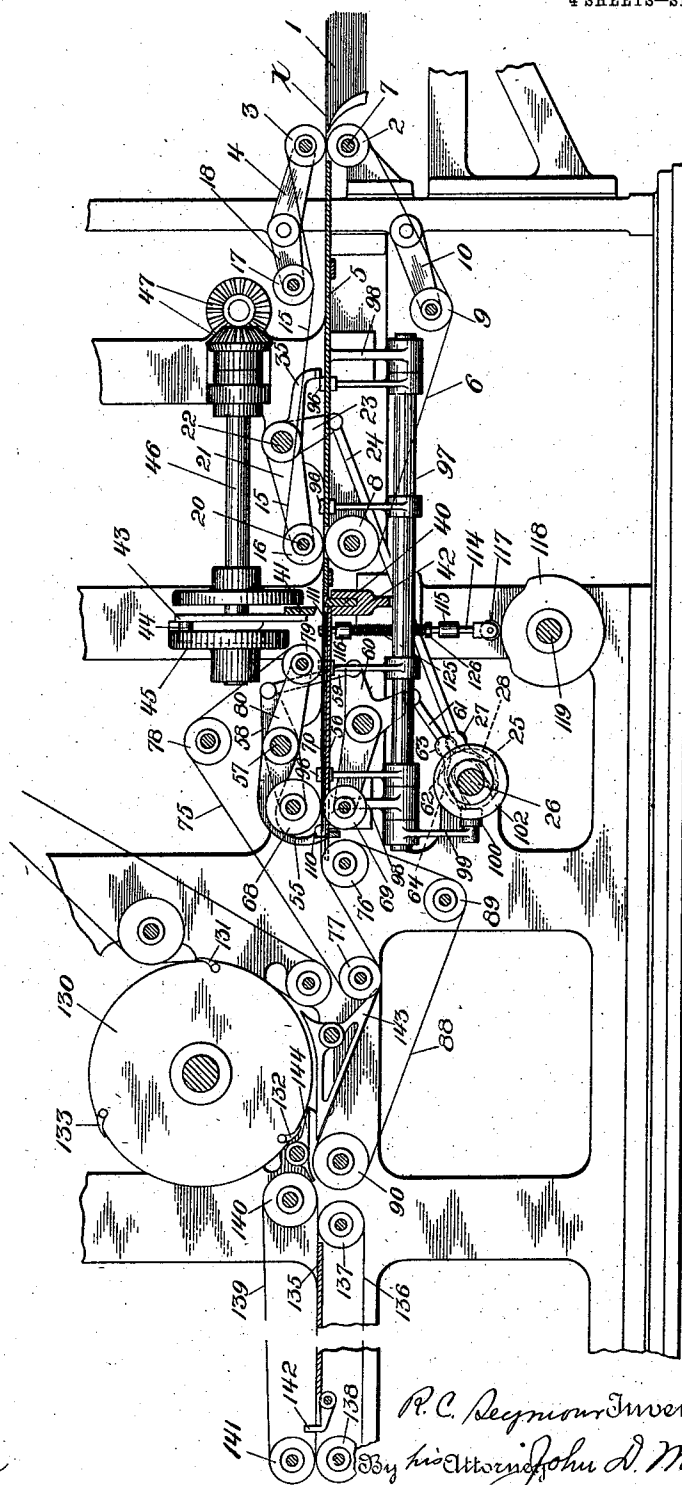
R. C. SEYMOUR.  
SHEET HANDLING MACHINE.  
APPLICATION FILED JUNE 15, 1910.

1,015,716.

Patented Jan. 23, 1912.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:  
John Darby  
Ross Menck

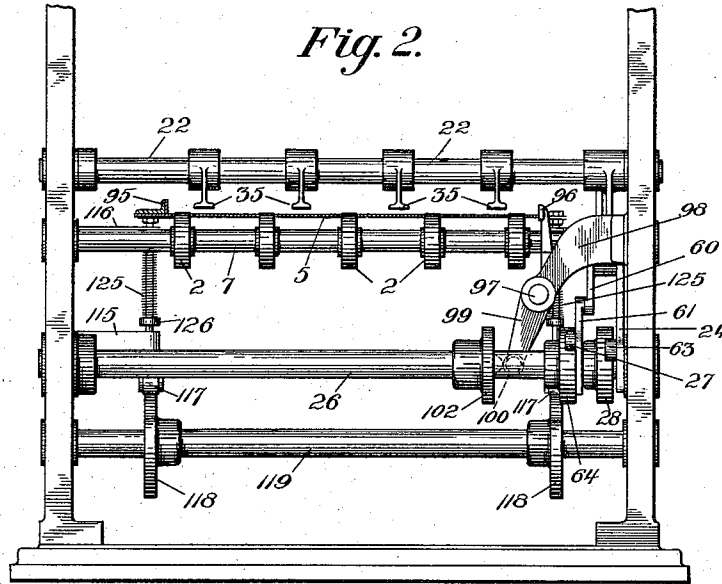
R. C. Seymour Inventor  
By his Attorney John D. Morgan

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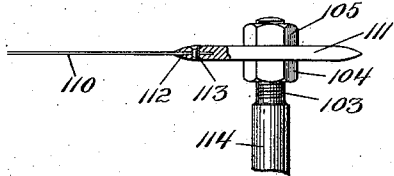
Patented Jan. 23, 1912.

4 SHEETS—SHEET 2.

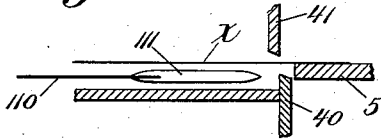


*Fig. 8.*

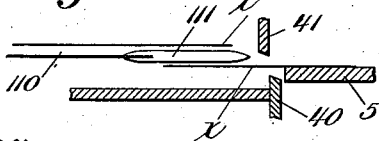
*Fig. 7.*



*Fig. 9.*



*Fig. 10.*



Witnesses:  
John Darby  
Rose Munk

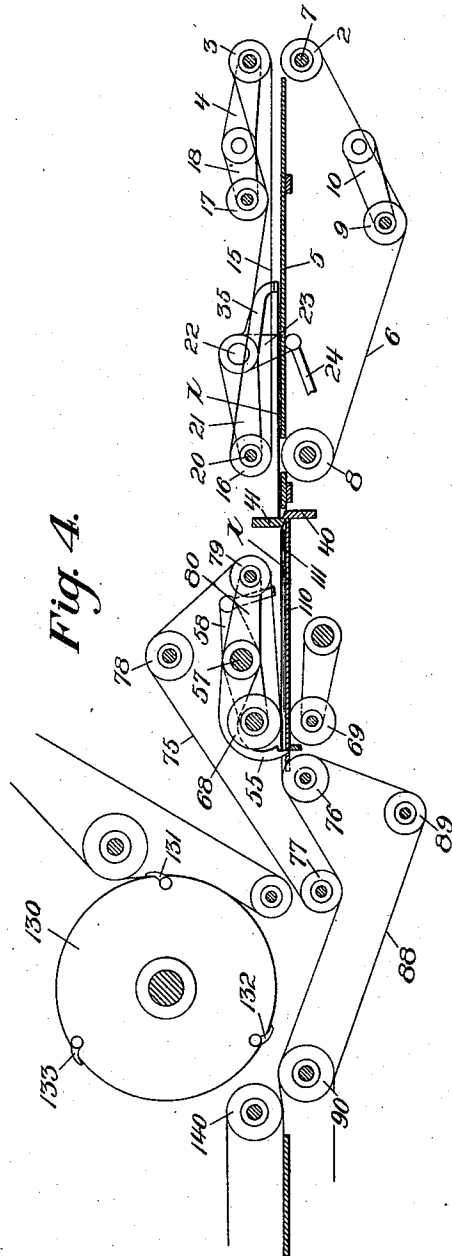
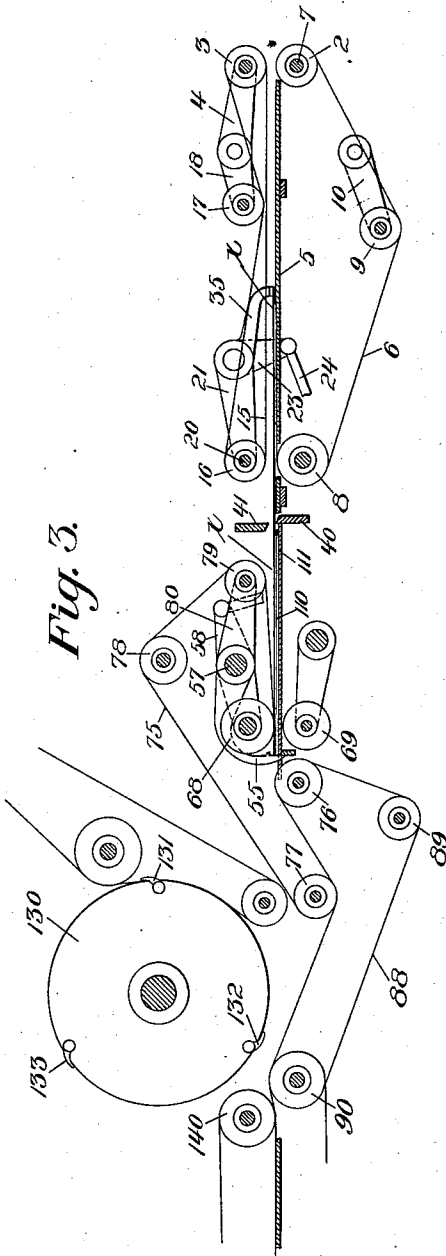
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4 SHEETS—SHEET 3.



Witnesses:  
John D. Barby  
Rose Menck

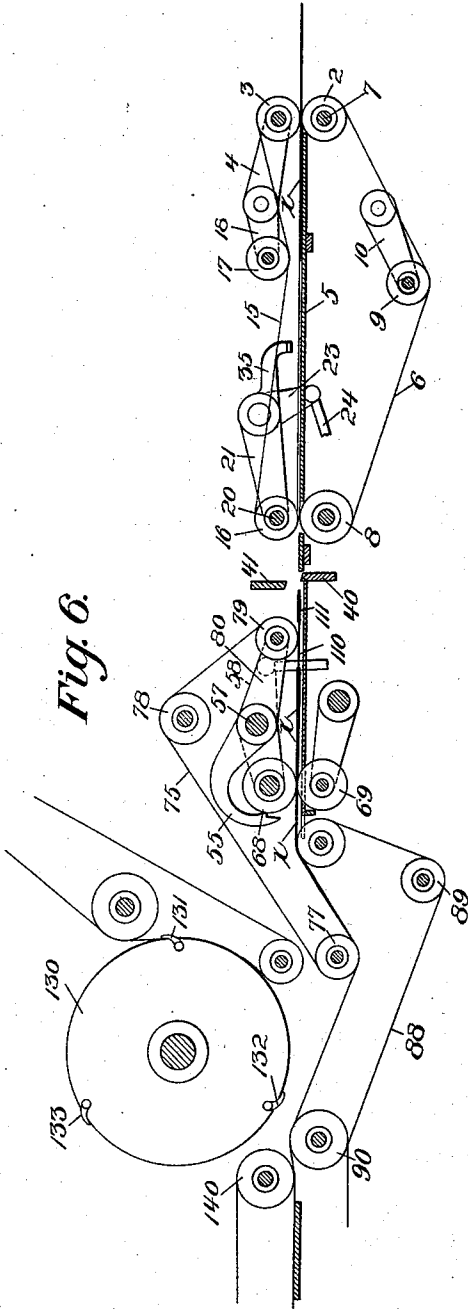
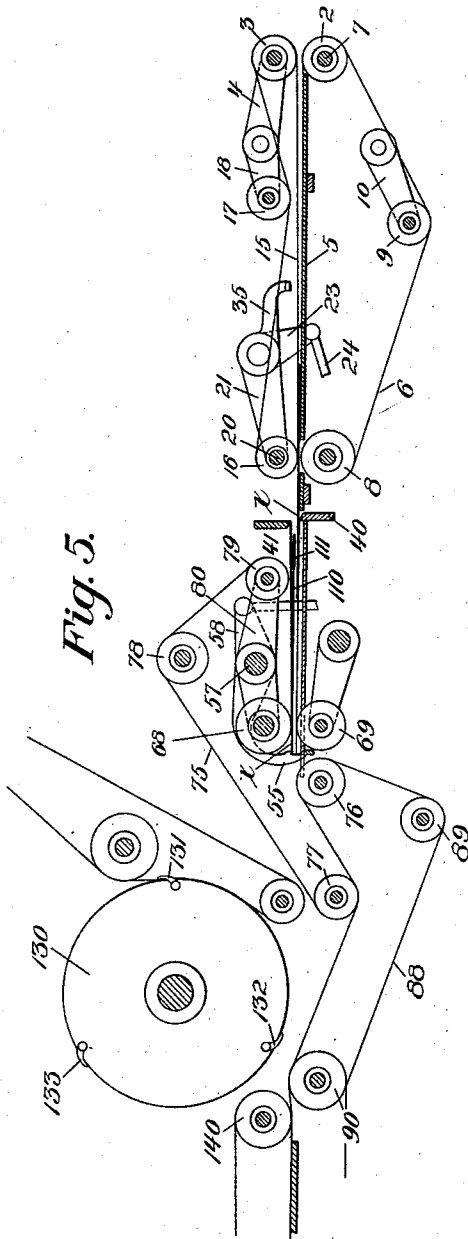
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4 SHEETS—SHEET 4.



Witnesses:  
*John Darby*  
*Ross Menck*

*R. C. Seymour* Inventor  
*John D. Morgan* Attorney

# UNITED STATES PATENT OFFICE.

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

## SHEET-HANDLING MACHINE.

1,015,716.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed June 15, 1910. Serial No. 567,101.

*To all whom it may concern:*

Be it known that I, RALPH C. SEYMOUR, a citizen of the United States, and a resident of Larchmont, in the county of Westchester and State of New York, have invented new and useful Improvements in Sheet-Handling Machines, of which the following is a specification.

The invention relates to sheet handling machines and in certain of its aspects more particularly to machines which will sever a sheet into a plurality of parts and superimpose the parts and feed the parts off a plurality at a time, superimposed and registered or, if desired, will feed off the parts singly and successively.

In certain respects the present invention is in the nature of an improvement upon the invention described and claimed in my pending application Serial No. 515,268 filed August 30, 1909. In addition to the objects of invention therein set forth, the present invention provides for certainty in the superimposition and joint registration of the two parts of a sheet, and also provides for the successful and accurate superimposition and joint registration of a plurality of sheets independently of the severing of a sheet into a plurality of parts; to provide for neutralizing the static electricity in the sheets; to provide for the sure registration and certain and easy feeding off of the superimposed sheets in register. These and other objects of invention will in part be obvious and will in part more fully appear herein.

The invention consists in the novel parts, arrangements, constructions, 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 in longitudinal section, with the driving parts omitted, of a machine constructed in accordance with the principles of the invention; Fig. 2 is an end elevation looking at Fig. 1 from the left, with the sheet feeding mechanism and the cutting knives omitted in order to show clearly the sheet reg-

istering devices and devices for separating one sheet from another during their superimposition; Fig. 3 is a fragmentary, partially diagrammatic view showing the feeding in and registering; Fig. 4 is a similar view, showing the severing of the sheets into two parts; Fig. 5 is a similar view showing the raising of the front portion of the sheet and the feeding in of the second portion therebeneath; Fig. 6 is a similar view showing the feeding off of the superimposed sheets; Fig. 7 is a fragmentary side elevation of the partition plate; Fig. 8 is a fragmentary top plan thereof; Fig. 9 is a fragmentary detail showing the feeding of a first sheet over the plate 110; and Fig. 10 shows the plate raised and the second sheet being fed therebeneath.

In the accompanying drawings, which illustrate a mechanism embodying the principles of the invention, a suitable source of sheet supply is provided, which may be of any convenient or approved form. Such sheet supply is shown herein as comprising a sheet stack 1, which may be contained by and operated upon by any desired form of sheet taking mechanism. The sheets may be fed in from the source of supply to the series of rollers 2 with which coöperates drop rollers 3 carried by the pivoted arms 4. The sheets then run along the pathway 5 being carried by a series of tapes 6, running over certain of the rollers 2, or other rollers, fixed on the shaft 7, said tapes at the other end running over the rollers 8. Suitable means may be provided for keeping these tapes 6 under proper tension such as a spring roller 9 mounted upon the arm 10 and acted upon by a suitable spring (not shown). A series of tapes 15 coöperating with the tapes 6, and acting upon the sheet from above may be provided, and said tapes may pass over the rollers 3, and also over a series of rollers 16. A series of rollers 17 may also be provided for the purpose of regulating the tension upon the tapes 15. Said rollers may be adjustably movable, and may also be spring pressed, if desired, or they may act by their own weight, or otherwise. They are shown herein carried upon the pivoted arm 18. The series of rollers 16 are also shown as drop rollers, coöperating with the series of rollers 8. Said rollers 16 are shown carried upon a rod or shaft 20,

carried by arms 21, the arms 21 being fixed to a shaft 22. Fixed also to the shaft 22 is shown an arm 23 to which is pivoted the rod 24 having a yoke 25 straddling the shaft 26.

- 5 Connected to the rod 24 or its yoke, is shown a hand roll 27 coöperating with a suitable cam 28 rotating with the shaft 26.

- A clamp for the rear part of the sheets is shown as a series of fingers 35 fixed to the shaft 22, in position to rock down and clamp the end of the sheet, or to rise up therefrom to permit the sheet to pass.

- Suitable sheet severing means are provided, and the illustrated form thereof comprises opposed knives 40 and 41. The knife 40 is shown mounted in the fixed bearing 42 on the machine frame. The knife 41 is shown carried upon a frame or plate 43 reciprocating in guides in the machine frame.
- 15 Upon the frame 43 is shown a cam roll 44, working in a box cam 45, carried by the shaft 46. Said shaft is driven by the miter gears 47 from any suitable source of power.

- A series of front stops or gages 55 are shown at the front end of the sheet support 56. The gages 55 consist of a series of arms fixed to a shaft 57, said shaft also having fixed thereto the actuating arm 58 connected by the pivoted link 59 to the bent lever 60. To the other arm of said bent lever 60 is pivoted a rod 61 having a yoke 62 straddling the shaft 26. Said rod 61 carries the cam roll 63 which coöperates with the cam 64 on the shaft 26 to actuate the said parts.
- 35 Above the sheet support 56 is shown a series of rollers 68 and coöperating with the said rollers 68 from beneath are a series of rolls 69 mounted upon arms 70, which arms are mounted concentrically with the bent lever 60 and rock therewith. A series of tapes 75 are shown running over a series of rolls 76 located in front of the front stops 55, and over a series of rolls 77 and 78, and also over a series of drop rolls 79. The drop rollers 79 are mounted upon arms 80, fixed to the shaft 57. Another series of tapes 88 are shown running over the rolls 76 and also over a series of rolls 89 and another series of rolls 90. The rolls 78 and 89
- 50 may be arranged to take up the tension of the tapes in any well known manner, no specific form of such mechanism being shown herein.

- Suitable means are provided for registering the sheets sidewise, and the form thereof herein shown comprises a fixed gage 95 at one side of the sheet support and a series of registering or jogging fingers 96 at the other side thereof. Said fingers are shown fixed on a shaft 97 carried by a bracket 98 on the machine frame. An arm 99 is fixed to the shaft 97 and has a cam roll 100 coöperating with a cam 102 carried by the shaft 22.

- 35 Means are provided by the invention for

receiving the first sheet or the front part of the sheet in case the sheets are severed into a plurality of parts, and for registering the sheet or part of a sheet, and for moving it out of the path of travel of the sheets and holding it in registered position at one side of said path of travel while a second sheet, or a second severed portion of the sheet, is fed forward and brought into registry with said first sheet, or portion thereof, preparatory to their being fed off together after being so registered. The form of such means shown herein comprises a plate 110 movable to one side or the other of the path of travel of the sheets in definite relation to the movement of the sheets. Said plate is shown carried by the cross piece 111, and shown set into a slot or kerf 112 therein, and secured in place by rivets 113 or any other suitable fastening means. The cross piece 111 is shown carried upon two rods 114, located at either end thereof. Each rod 114 is shown slidably carried in lugs 115 and 116 on the machine frame. In the end of each rod 114 is shown a cam roll 117, coöperating with a cam 118. The cams 118 are fixed upon a shaft 119, journaled in the machine frame, and driven in any suitable manner. Upon each of the rods 114 is shown a coil spring 125, mounted between the lug 116 and an adjustable collar 126 on the rod 114.

One use of the mechanism just described is to associate an insert or a cover with a bundle of sheets, so that they may be stitched and folded together. There is shown therefore a source of sheet supply herein, though not in specific detail, as the particular form thereof is not a part of the present invention. Said sheet supply is shown as comprising a three-way cylinder 130, having a set of grippers 131, another set 132 and a third set 133. These will receive, collate and deliver so collated or associated sheets fed to them in one, two, three, four order, in a well known manner. These sheets may then be fed off along a suitable path 135 and be driven by a series of tapes 136 running over two series of rolls 137 and 138. Coöperating therewith may be a series of tapes 139 running over a series of rolls 140 and 141. A suitable registering stop 142 is conventionally shown for arresting and registering the sheets fed from the cylinder 130, and the sheet or sheets fed from the other mechanism between the tapes 75 and 38. A suitable gate 143 and a stripper 144 may be used if desired.

The cross piece 111 is adjustably mounted relatively to the rod 114 and for this purpose the ends of said rods 114 are shown threaded at 103, said threaded portion carrying a nut 104 upon one side and another nut 105 upon the other side of the cross piece 111. This serves to adjust the piece 111

and also to lock it firmly in position. The said piece is shown tapered or beveled at its front and rear edges so as to facilitate the passing of the sheet on either side thereof.

Also the portion of the sheet path forward of the cutters is shown see Figs. 9 and 10, a little lower than the portion to the rearward of the cutters. This permits the plate 110 to lie below the level of the rearward portion of the pathway and thus permit the sure and easy running in of the sheet. It also gives plenty of room beneath the plate 110 after it is raised to allow the second part of the sheet to run in freely therebeneath.

The manner of operation of the herein described mechanism is substantially as follows: We will consider first the feeding, cutting, superimposition and feeding off in register of two parts of an original single sheet. In Fig. 1 of the drawings a sheet  $x$  is shown being fed in under the drop rollers 3 and between the tapes 6 and 15. The tail clamp 35 is shown up, and the knives 40 and 41 separated. The plate 110 is shown just above the sheet support 56 and with the upper surface of the cross piece 111 substantially in the level of the rear path or support 5 for the sheets. The front stops 55 are just rocking downwardly and will be in position to stop and register the sheets  $x$  just prior to the sheet reaching them. In Fig. 3 the front stops 55 are shown down and the sheet  $x$  stopped and registered thereby. The tail clamp 35 is also shown clamping and holding firmly the rear part of the sheet. The drop rollers 3 and 16 are also shown in raised position and also the drop rollers 79 and 69. In Fig. 4 the knives 40 and 41 are shown severing the registered sheet into two parts. In Fig. 5 the knives 40 and 41 are shown separated after the cutting operation, and the partition plate 110, through the action of the cams 118 upon the spring pressed rods 114, has been lifted from its position just above the sheet support 56 to a position above the level of the sheet support or path 5. The front portion  $x$  of the sheet has been lifted on said plate 110, but has not been disturbed as regards its relation to the front stops 55. The tail clamps 35 have been rocked up and the drop levers 16 have been dropped down, and the second part of the sheet  $x$  is being fed in beneath the cross plate 11 and the partition plate 110 and into registry with the front gages 55. (See also Figs. 9 and 10.) In Fig. 6 of the drawings front stops 55 are shown raised and the drop rollers 79 are shown in operative relation with the upper portion of the sheet  $x$  and the drop rollers 69 in operative relation with the lower portion of the sheet  $x$ . They will thus be fed off together, in registered relation from either side of the partition plate 110 along

their path of travel between the tapes 75 and 88. At the same time the rear drop rollers 3 are down and feeding in a new sheet. As the sheets  $x$  are fed along their path, the jogging fingers 96 keep them in register with the side gage 95. Also as the insert or cover sheets are fed in as just described, the bundle of sheets from the collecting cylinder 130 is associated therewith and the insert or cover and the sheet bundle pass together along the pathway 135, impelled by the series of tapes 136 and 139 and are accurately registered with respect to each other by the gage 142.

The actuating mechanism for all the drop rollers and the tension devices for some of the tension regulating rollers, and the driving means for the driven rollers and tapes are not shown herein, as such mechanisms are old and well known in the art, and are omitted for the sake of clearness in showing the principal parts of the mechanism.

By means of the present machine, covers or inserts may be associated, registered and fed in with great rapidity, accuracy and reliability, and associated and registered quickly and accurately with a bundle of sheets from a separate source of supply. As the two portions of the sheet are moved into superimposition, there is no running or friction of one part of the sheet on the other with the tendency to thus destroy their common registration, and this is particularly so when the sheets are highly electrified. This phenomenon at times will practically stop the feeding of the sheets past each other where one sheet slides directly upon the other. The use of the plate between the sheets not only gives a free run of each part of the sheet to the registering stop, and permits the transverse movement of one part of the sheet without destroying its registry, but where the plate is of metal it also tends to neutralize the electrical charge upon the sheets.

Other advantages and objects of invention than those specified will be obvious to those skilled in the art from the specification and by observation of the actual operation of the machine.

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. A sheet handling machine including in combination a front registering gage, means for feeding sheets thereto, means for moving an entire registered sheet transversely perpendicularly to the plane of the sheet

without disturbing its registry against said front gage, whereby a second sheet may be fed to said gage and thus associated and registered with the first-mentioned sheet, and means for feeding off together said registered and associated sheets unfolded.

2. A sheet handling machine including in combination a front registering gage, means for feeding sheets along a horizontal path into registry with said front gage, means for lifting an entire sheet without moving it out of registering relation with said gage, whereby said feeding means may feed a second sheet into registry with said gage without said sheet contacting with said first-mentioned sheet.

3. A sheet handling machine including in combination a front gage, means for feeding sheets along a path into registry with said front gage, means for moving said registered sheet out of said pathway while keeping it in register and for preventing contact between said sheet and a second sheet which is fed along said path into registry with said gage.

4. A sheet handling machine including in combination a front gage, means for feeding sheets along a path into registry with said front gage, means for moving said registered sheet out of said pathway while keeping it in register and for preventing contact between said sheet and a second sheet which is fed along said path into registry with said gage, and means for feeding the two sheets off together.

5. A sheet handling machine including in combination a front gage, means for feeding sheets along a path into registry with said front gage, means for moving said registered sheet out of said pathway while keeping it in register and for preventing contact between said sheet and a second sheet which is fed along said path into registry with said gage, and means for feeding the two sheets off together unfolded.

6. A sheet handling machine including in combination a front gage, means for feeding sheets along a path into registry with said front gage, means for moving said registered sheet out of said pathway while keeping it in register and for preventing contact between said sheet and a second sheet which is fed along said path into registry with said gage, and means for feeding the two sheets off together unfolded in the same direction as they were fed to the gage.

7. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto to register same, means for severing the registered sheet, and means for moving the front registered portion of said sheet transversely and preventing contact between the two portions while the second portion is fed to said stop to register and associate the two portions.

8. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto to register same, means for severing the registered sheet into portions, and means for moving the entire front portion transversely without moving it out of registered relation with said front gage, whereby another portion may be fed to said gage without contacting with said front portion, and means for feeding said portions off associated.

9. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto along a straight path, means for severing the registered sheet into portions, means for lifting the entire forward portion out of said pathway without moving it out of registered relation, whereby another portion may be fed to said gage along said path.

10. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto along a straight path, means for severing the registered sheet into portions, means for lifting the entire forward portion out of said pathway without moving it out of registered relation, whereby another portion may be fed to said gage along said path, and means for feeding off said sheets associated.

11. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto along a straight path, means for severing the registered sheet into portions, means for lifting the entire forward portion out of said pathway without moving it out of registered relation, whereby another portion may be fed to said gage along said path, and means for feeding off said sheets associated and unfolded.

12. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto along a horizontal path, means for severing the registered sheet into portions, means for moving the entire front portion transversely out of said path without moving it forward or backward along said path, whereby another portion may be fed to said gage.

13. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto along a horizontal path, means for severing the registered sheet into portions, means for lifting the entire front portion transversely out of said path without moving it forward or backward along said path, whereby another portion may be fed to said gage.

14. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto along a horizontal path, means for severing the registered sheet into portions, means for lifting the entire front portion transversely out of said path without moving it forward or backward along

said path, whereby another portion may be fed to said gage, and means for feeding them off unfolded.

15. A sheet handling machine including in combination a front stop, means for feeding a sheet thereto, means for severing the registered sheet into portions, means for moving the entire front portion transversely, whereby another of said portions may be fed to said front gage without contacting with said front portion.

16. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto, a metal support for the registered sheet, means for moving said support with the sheet upon it while preserving the sheet in registered relation, whereby the next succeeding sheet is fed to said gage out of contact with said first sheet.

17. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto, a metal support for the registered sheet, means for moving said support with the sheet upon it while preserving the sheet in registered relation, whereby another sheet may be fed to said gage on the opposite side of said metal support.

18. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto, means for severing the registered sheet into a plurality of parts, a metal support for the forward part, means for moving said metal support to permit another part of said sheet to be fed to said gage on the opposite side of said support from said front part.

19. A sheet handling machine including in combination a front gage, means for feeding sheets thereto along a horizontal path, means for severing the registered sheet into a plurality of parts, a support for the entire part of the sheet between the gage and severing means, means for lifting said support and the registered sheet thereupon out of said path to permit another part of the sheet to be fed to said front stop.

20. A sheet handling machine including in combination a front gage, means for feeding sheets thereto along a horizontal path, means for severing the registered sheet into a plurality of parts, a support for the entire part of the sheet between the gage and severing means, means for lifting said support and the registered sheet thereupon out of said path to permit another part of the sheet to be fed to said front stop, and means for feeding off said two parts together, registered and associated.

21. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto, means for severing the registered sheet into two parts, a support for the entire part of said sheet between the gage and severing means, means for moving said support with the registered sheet

thereon, and means for feeding up the rear part of said sheet to said gage upon the opposite side of said support.

22. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto, means for severing the registered sheet into two parts, a support for the entire part of said sheet between the gage and severing means, means for moving said support with the registered sheet thereon, means for feeding up the rear part of said sheet to said gage upon the opposite side of said support, and means acting upon said separated parts of the sheet to feed them off together.

23. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto, means for severing the registered sheet into two parts, a support for the entire part of said sheet between the gage and severing means, means for moving said support with the registered sheet thereon, means for feeding up the rear part of said sheet to said gage upon the opposite side of said support, and means acting upon said separated parts of the sheet to feed them off together unfolded.

24. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto, means for severing said registered sheet, a movable plate beneath the part of the sheet between said gage and severing means, means for moving said plate after the sheet is severed, a drop roller at the rear of the severing means and a drop roller near said gage.

25. A sheet handling machine including in combination a front gage, means for feeding a sheet thereto along a horizontal path, means for severing said registered sheet, a movable plate beneath the part of the sheet between said gage and severing means, means for moving said plate after the sheet is severed, a drop roller at the rear of the severing means and a drop roller near said gage, means for operating said first-mentioned drop roller after the sheet is severed, and means for operating said last-mentioned drop roller after the rear portion of the sheet has been fed to said gage.

26. A sheet handling machine including in combination a horizontal pathway for sheets, a movable sheet support forming a portion of said pathway, means for feeding sheets in succession, means for moving said sheet support into and out of said pathway between the feeding of successive sheets, sheet registering means, sheet severing means arranged to sever the registered sheet, means for arresting the rear part of the sheet before severing and means for feeding the rear part forward after severing.

27. A sheet handling machine including in combination a pathway for sheets, regis-

tering means, severing means arranged along said pathway, a plate in said pathway between said severing means and registering means, means for feeding in the sheet, 5 means for severing the sheet, means for moving said plate out of the pathway and means for feeding the other portion of said sheet along the pathway to the registering means, drop rollers and tapes acting on 10 the sheet on one side of said plate and drop rollers and tapes acting on the sheet on the other side of said plate to feed the two parts of the sheet off together.

28. A sheet handling machine including 15 in combination a horizontal pathway for sheets, a movable sheet support forming a

portion of said pathway, means for feeding sheets in succession, means for moving said sheet support into and out of said pathway between the feeding of successive sheets, 20 front gages for stopping and registering the sheet, a side register along said pathway and means for pushing the sheet there-against.

In testimony whereof, I have signed my 25 name to this specification, in the presence of two subscribing witnesses.

RALPH C. SEYMOUR.

Witnesses:

JOHN D. MORGAN,  
ROSE MENK.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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