

H. K. KING.
MACHINE FOR FEEDING SHEETS,
APPLICATION FILED APR. 29, 1908.

942,078.

Patented Dec. 7, 1909.
6 SHEETS—SHEET 1.

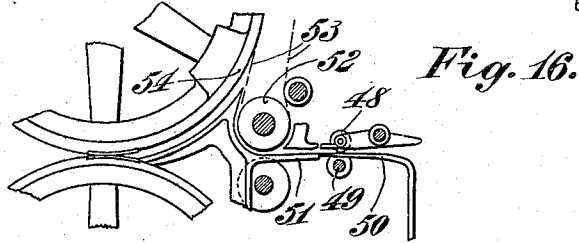


Fig. 16.

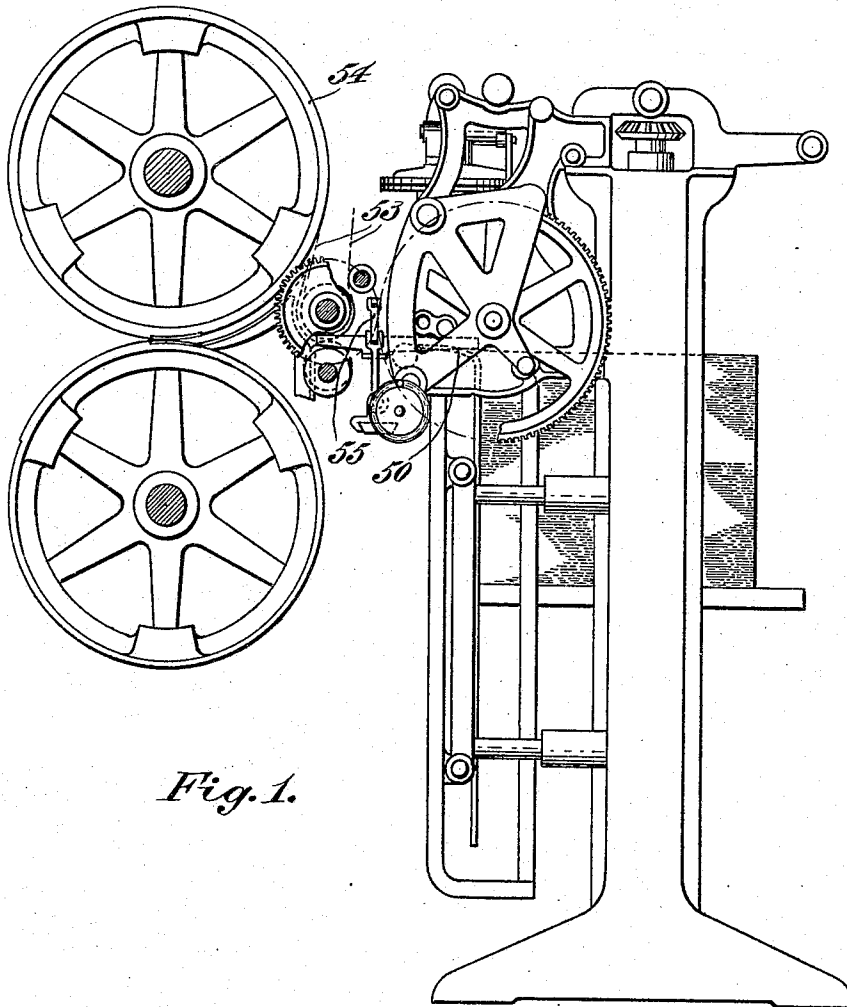


Fig. 1.

WITNESSES:

Jas. C. Wolvenmith
Mae Hofmann

INVENTOR

Howard K. King,

BY

Wm. Woodsdale

ATTORNEY.

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6 SHEETS—SHEET 2.

Fig. 3.

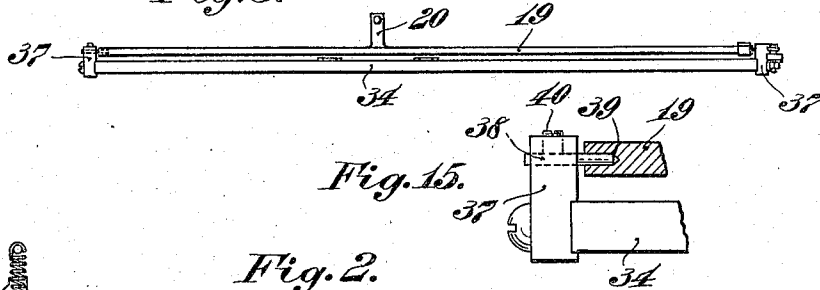


Fig. 15.

Fig. 2.

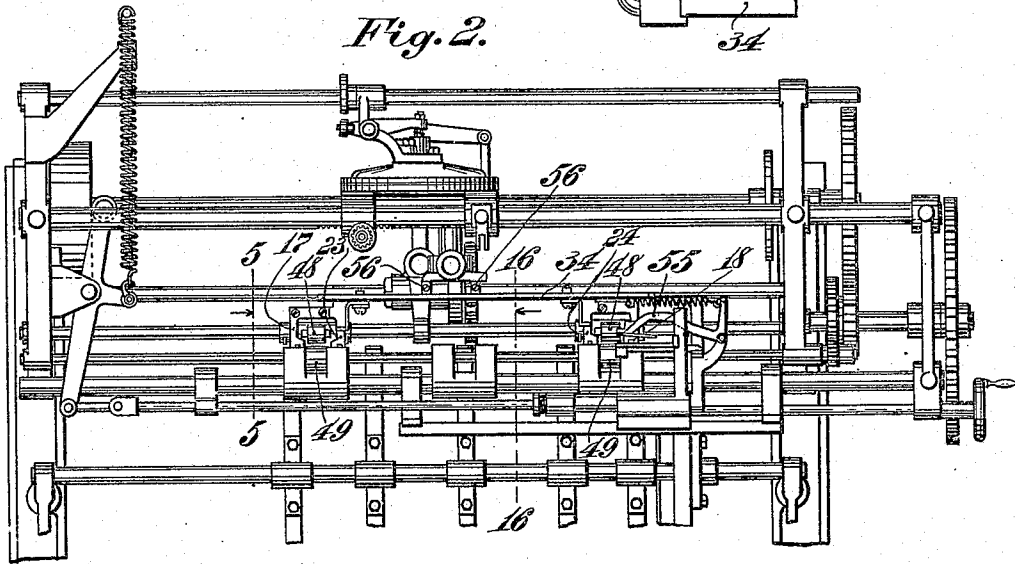
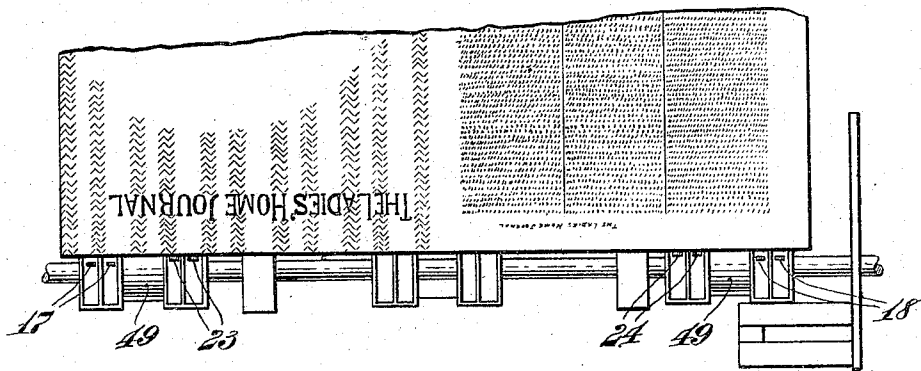


Fig. 4.



WITNESSES:

Jas. C. Woburnsmith
Max Hofmann

INVENTOR

Howard K. King,

BY

Not a Co. del
ATTORNEY.

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6 SHEETS—SHEET 3.

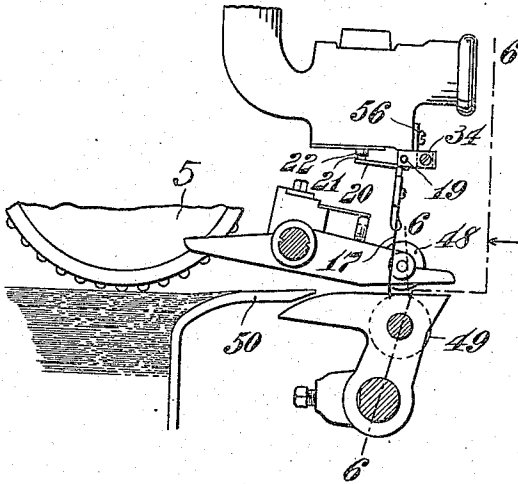


Fig. 5.

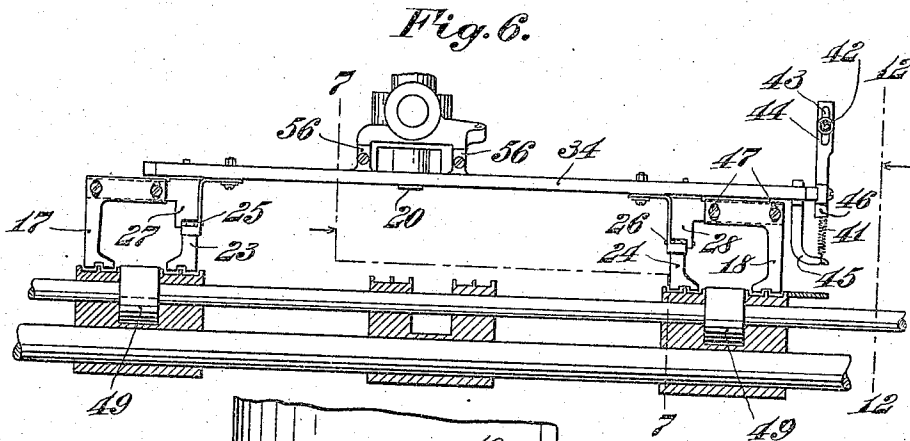


Fig. 6.

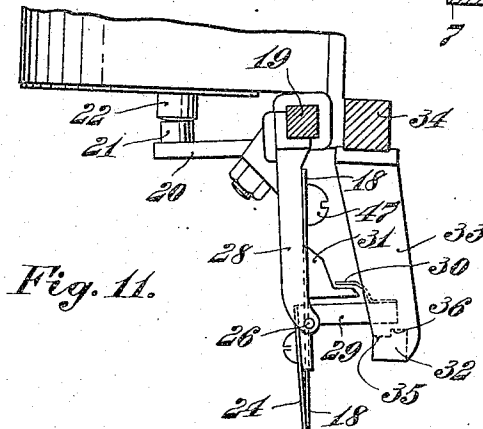


Fig. 11.

WITNESSES:

Jas. C. Wolensmith
Max. Hofmann

INVENTOR

Howard K. King,

BY

Att. Gen. del.
ATTORNEY.

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6 SHEETS—SHEET 4.

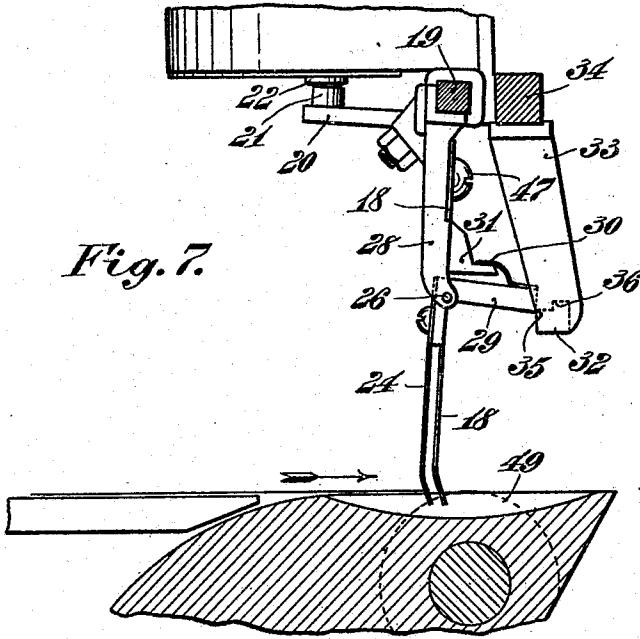


Fig. 7.

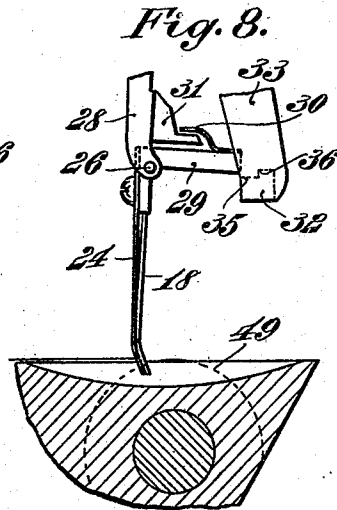


Fig. 8.

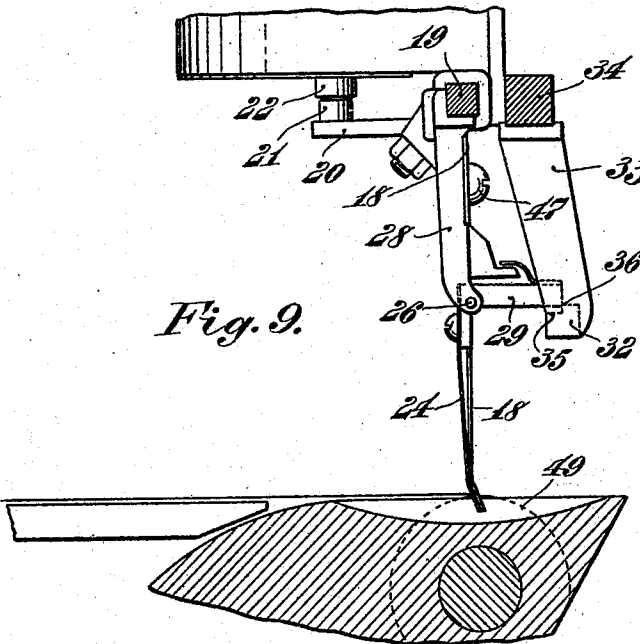


Fig. 9.

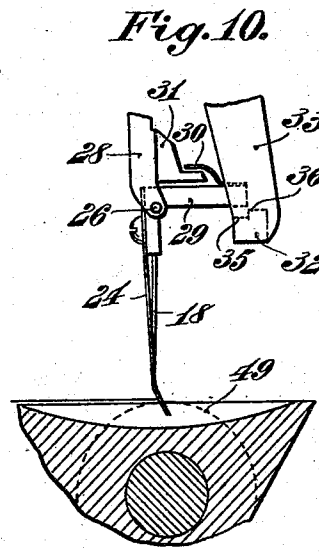


Fig. 10.

WITNESSES:

Jas. C. Mohrsmith
Mae Hofmann

INVENTOR

Howard K. King,

BY

W. C. King, Jr.,

ATTORNEY.

H. K. KING.
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6 SHEETS—SHEET 5.

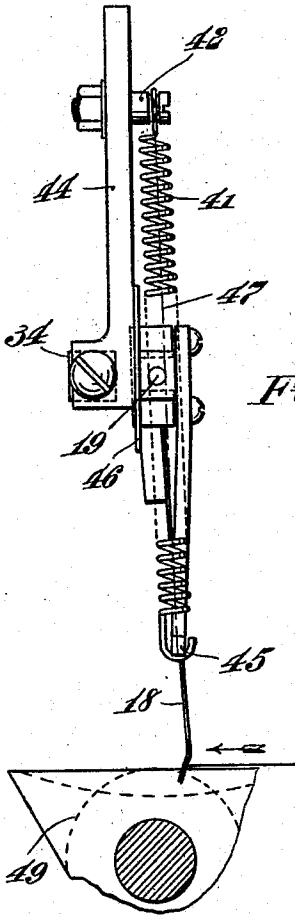


Fig. 12.

Fig. 13.

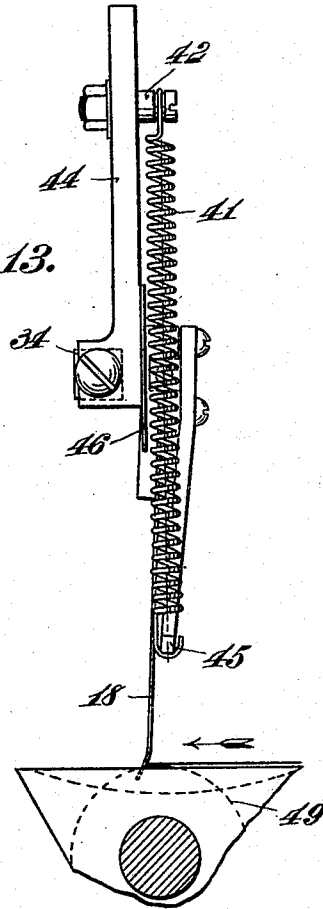
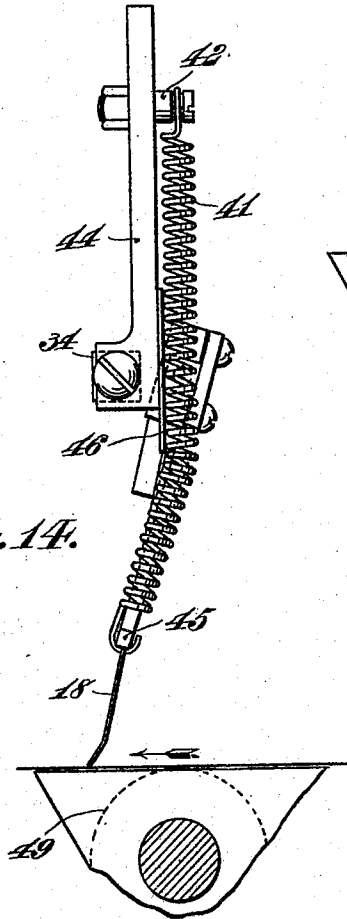


Fig. 14.



WITNESSES:

*Jas. C. Woburnsmith
 Mae Hofmann*

INVENTOR

Howard K. King,

BY

McGowan, dals.

ATTORNEY.

UNITED STATES PATENT OFFICE.

HOWARD K. KING, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO CHAMBERS BROTHERS COMPANY, A CORPORATION OF PENNSYLVANIA.

MACHINE FOR FEEDING SHEETS.

942,078.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed April 29, 1908. Serial No. 430,010.

To all whom it may concern:

Be it known that I, HOWARD K. KING, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented a new and useful Machine for Feeding Sheets, of which the following is a specification.

My invention relates to improvements in feeding devices for folding machines or the like.

The object of the invention is to provide improved means for guiding the sheets and squaring the same before they are delivered to the receiving device.

My invention also comprises improved means for registering the sheets after being delivered by the feeding device and before being operated upon by the receiving device.

Referring to the drawings:—Figure 1 is a side elevation of my improved feeding device adapted to deliver to a folding machine, two wheels of which are shown. Fig. 2 is a front elevation of the upper portion of my machine. Fig. 3 is a plan view of the valve trip supporting bar. Fig. 4 is a diagrammatic plan view of a sheet combed up against the latch fingers. Fig. 5 is a section on line 5—5 of Fig. 2. Fig. 6 is a section on line 6—6 of Fig. 5. Fig. 7 is a section on line 7—7 of Fig. 6. Fig. 8 is a view similar to Fig. 7, only more fragmentary, showing the latch in different position. Fig. 9 is a similar view to Fig. 7, showing the latch in a still different position. Fig. 10 is a similar view to Fig. 8, showing the latch in a still different position. Fig. 11 is a view similar to Fig. 9, showing the valve trip in a different position. Fig. 12 is a section on line 12—12 of Fig. 6, on an enlarged scale, showing spring controlling mechanism, the position of the parts being the same as that shown in Fig. 7. Fig. 13 is a similar view in the position shown in Fig. 11. Fig. 14 is a similar view in the position showing the sheet running under the finger. Fig. 15 is a detail showing bearing of trip supporting rod. Fig. 16 is a detail showing guiding means for the sheet between the delivering and receiving mechanism.

Similar numerals refer to similar parts throughout the several views.

This invention relates chiefly to a modification in a sheet feeding machine such as is shown in patent to me No. 768,375, dated Aug. 23, 1904. Referring to which patent it will only be necessary to describe, for the purposes of the present application, the structures which comprise the improvements and modifications over the structures illustrated and described in said patent. Referring to said Patent No. 768,375, the sheets are combed forward by the pair of combing wheels 5, 5 which are operated by pneumatic pressure heads controlled by valves, which in turn are controlled by valve trips actuated by the edge of the advancing sheet. Where two combing wheels are used, and each combing wheel is controlled by its valve trip, as shown in my said patent, it is a simple matter to secure the proper squaring of the sheet before the same is permitted to be acted upon by the drop and feed rollers. Where, however, only one combing wheel can be used, it becomes necessary to provide a different controlling mechanism. For example where it is desired to feed sheets forming the covers of a journal, one side of which sheet is so covered with printing matter as to make it undesirable to have a combing wheel operate thereon, it is necessary to use a single combing wheel traveling down the middle part of the sheet, or approximately the middle part, where an unprinted surface may be found.

When the sheets operated upon by a single combing wheel, traveling along the middle part thereof, especially when the sheets are moved in the direction of their lesser dimension, and are operated upon by blowers to partially float the same, there is a tendency of the sheets to pivot or to turn under the combing wheel, as they are being combed forward, and it is necessary that special means be provided for securing an absolutely square presentation of the front edge of the sheet before the combing wheel is lifted, and the feed and drop rollers are permitted to act thereon. Referring to Fig. 6, the valve trips 17 and 18 are substantially simi-

lar, in operation and function to the valve trip 8 in said patent, that is, when the sheet advances squarely, sufficiently to operate these said valve trips 17 and 18, which are
 5 secured to the shaft 19, see Fig. 11, shaft 19 is operated to move the arm 20 carried thereon, and provided with lug 21. Lug 21 controls the operation of piston 22 which corresponds to piston 12, see Fig. 13 of said
 10 patent. One of the differences in my present device however consists in a latching mechanism and means for controlling the same for normally preventing the actuation of said valve trips 17 and 18. Referring
 15 again to Fig. 6 I provide the latch trips 23 and 24 which are pivotally mounted at 25 and 26 to brackets 27 and 28 also carried by shaft 19. To these trips 23 and 24 are secured the latch members 29, see Fig. 11,
 20 provided with the arm 30 adapted to engage with lug 31 to limit its downward movement. Latch 29 is adapted to have two latching engagements with the member 32 carried on arm 33 secured to bar 34 which
 25 carries the bearings of shaft 19 as shown in detail in Fig. 15. These two points of engagement are point marked 35 and point marked 36. Fig. 7 shows the latch engagement with the first point 35. Fig. 8 shows
 30 the latch clearing said first point. Fig. 9 shows the engagement with the second point 36 and Fig. 10 shows the latch clearing said second point 36.

The bar 34 is secured to the machine in
 35 any suitable way and has connected therewith the end pieces 37, see Fig. 15, through which project the pins 38 into recesses 39 countersunk in each end of shaft 19. The pins 38 are secured in position by set-
 40 screws 40.

The shaft 19 is spring controlled for normally maintaining the arm 20 in the position shown in Fig. 7, to maintain the valve piston 22 elevated in the manner and for the
 45 purpose described in my said patent. This spring is indicated by the numeral 41 in Figs. 6, 12, 13 and 14. It is secured at one end to the stud 42 adjustably secured by the bolt and nut in slot 43 of member 44 which
 50 is secured to the bar 34. The other end of the spring is secured to the lower end or hook on arm 45, which is secured to the shaft 19. The plate 46 is secured to member 44 and is adapted to engage the spring for
 55 some distance below the axis of shaft 19. The required tension of the spring is secured by the adjustment of the stud 42. The line indicated by the numeral 47 in Fig. 12 is
 60 the line of spring force exerted between its two points of connection, one to stud 42 and the other to hook member 45. This line of force, it is noted, is to the right of the axis of rotation of shaft 19, and therefore the spring tends to hold said shaft from move-

ment in the clockwise direction, that is, as
 viewed in Fig. 12. When the lower point of
 hook member 45 is carried to the position
 shown in Fig. 13, the line of force between
 said two points of spring connection is ap-
 proximately intersecting the axis of shaft
 19, so that the spring is practically neutral
 in said position. The purpose of which will
 be described hereinafter.

In Fig. 16, are shown the drop roller 48 and the feed roller 49 of the feeding ma-
 75 chine, 50 indicates one of a series of guides for supporting the sheet as it is moved forward toward these rollers. A series of supplemental or receiving guides 51 are connected with the folding machine. These
 80 guides 51 serve to send the sheet upwardly under roller 52 to be engaged between belts or tapes 53 and wheel 54. Between the feeding machine and the folding machine is located and operated the side registering nip-
 85 per 55; said relative position is indicated in Fig. 1, and the nipper is also clearly shown in Fig. 2. The construction and operation of this nipper is fully described by me in patent to me No. 768,375; Aug. 23,
 90 1904, and the same is not claimed in this application broadly, but simply will be claimed as side registering means operating after the delivery by the feeding machine,
 95 during the dwell of the sheet, and before being taken by the folding machine.

The operation of my device is as follows: The normal position of the trips 18 and 24 as well as 17 and 23 is shown in Fig. 7. In this position the latch 29 is in engagement
 100 with point 35 of member 32, which locks the shaft 19 from rotation as above described. It will thus be seen that when the sheet travels forward in the direction of the arrow, it will first encounter the trips 23 and
 105 24. If it is traveling straight it will encounter both trips simultaneously to release both latches 29 as shown in Fig. 8. It will then continue forward until it encounters
 110 fingers 17 and 18 causing the movement of same and the rotation of shaft 19 unless either of latches 29 encounters point 36 on bar 32. If the sheet is still square the further
 115 actuation of 23 and 24 will carry both latches clear of point 36 and permit the full actuation of 17 and 18, and the consequent actuation of shaft 19 to permit the fall of
 120 valve piston 22. In case the sheet encounters trip 23 before trip 24, or vice versa, the corresponding latch 29 will be released, but the other latch will still hold shaft 19 locked
 125 until the sheet is squared so as to actuate the other latch. Thus no movement of shaft 19 is permitted until the sheet is approximately square, and such movement will only
 be permitted as to carry the latch from point 35 to point 36 unless the sheet is square at the second point. At the position of the

sheet slightly beyond that which shall carry the latches from point 36, the feed and drop rollers are adapted to operate thereon. It will thus be seen that a double provision is made to secure the sheet approximately square, when the latches are released from points 35 and again when the latches are released from points 36, beyond which second point the valve trip is operated to cause the lifting of the combing wheel. It is also to be remembered that the shaft 19 is normally under the control of spring 41, and that this spring is primarily overcome by the actuation of the sheet combed forward by the combing wheel engaging with the fingers 17 and 18. If this spring tension continued after the combing wheel was lifted from the sheet, the tendency would be to kick the sheet backward in the effort exerted by the spring to assume its normal position. To obviate this, I have provided the structure already described in connection with Figs. 12, 13 and 14, that is, the points of spring connection are in a line slightly to one side of the axis of shaft 19 until the fingers 17 and 18 are actuated by the sheet. The line of spring tension is then brought into coincidence with said axis of shaft 19 so that the spring is neutral with respect to said fingers 17 and 18, and there is no tendency to push the sheet backward. When the sheet is then operated on by the drop and feed rollers it is easily carried beneath the fingers by the further bending of the spring as indicated in Fig. 14. The plate 46 is merely supplied to secure the bend of the spring at the most efficient point, which may be determined by experimentation. When in the position shown in Fig. 14, the spring 44 is put under such tension, that, when released by the sheets being withdrawn from under it, it will be carried by momentum past the neutral point above described, into initial position shown in Fig. 12. The slight lateral displacement of the sheets on the feeding machine is ordinarily corrected by a side registering mechanism on the folding machine, but in the device, specifically described and illustrated in this application, the sheets delivered by the feeding device to the folding machine are the covers of a magazine; the other parts of the magazine are delivered simultaneously to the same part of the folder, and all are carried together between the belt 53 and wheel 54, so that there is no opportunity for the side registering of said covers, after the same are delivered to the folder. It therefore becomes necessary to so connect up the several operative mechanisms, that there shall be a dwell after the delivery of the sheet from the feeding machine, and before the receiving of the sheet by the folding machine, and I provide a side registering mechanism such

as is described in my Patent 768,375. This registering mechanism is positioned and operated relatively, so as to operate upon the sheet to bring it to side register, during said dwell. It is also to be noted that the drop roller 48 and feed roller 49 are operated in substantially the same way as the drop and feed rollers 49 and 59 of my Patent 768,375. Said actuating means forming no part of this invention except as affected by the latch controlled trip of the present invention.

What I claim is:—

1. In a sheet feeding machine, the combination of means for combing the sheets, valve controlled means for disengaging the combing means from the sheets, a valve trip to be encountered by the advancing sheet and a trip latch also to be encountered by the advancing sheet.
2. In a sheet feeding machine, the combination of means for combing the sheets, valve controlled means for disengaging the combing means from the sheets, a valve trip and independently operated trip latches encountered by the advancing sheet for controlling the valve trip.
3. In a sheet feeding machine, the combination of means for combing the sheets forward, pneumatic means for rendering said combing means effective or ineffective, valve trips actuated by the advancing sheet for controlling the pneumatic means, and trip latches controlling the valve trips also actuated by the advancing sheet to release the valve trips only when the latches are actuated simultaneously, as and for the purpose specified.
4. In a sheet feeding machine, the combination of a combing wheel adapted to operate upon the sheet about midway its extension, valve controlled means for disengaging the combing wheel from the sheet, a valve trip to be encountered by the advancing sheet, and valve trip latches adapted to be actuated by the advancing sheet.
5. In a sheet feeding machine, the combination of a combing wheel adapted to operate upon the sheet about midway its extension, valve controlled means for disengaging the combing wheel from the sheet, a valve trip to be encountered by the advancing sheet, and trip latches for controlling the valve trip adapted to be actuated by the advancing sheet simultaneously to release said valve.
6. In combination with sheet actuating means, valve controlled means for rendering the actuating means inoperative, a valve trip adapted to be actuated by the advancing sheet, and trip latches also actuated by the advancing sheet rendered ineffective only by contemporaneous actuation.
7. In a sheet feeding machine, the combi-

nation of sheet actuating means, valve controlled means for rendering the actuating means ineffective, a valve trip actuated by the advancing sheet, latches for controlling the valve trip also actuated by the advancing sheet adapted to release the valve trip only upon contemporaneous actuation.

8. In a sheet feeding machine, the combination of sheet actuating means, valve controlled means for rendering the actuating means ineffective, a valve trip actuated by the advancing sheet, latches for controlling the valve trip also actuated by the advancing sheet and having two points of latch engagement, one in advance of the other.

9. In a sheet feeding machine, the combination of sheet actuating means, valve controlled means for rendering the actuating means ineffective, a valve trip actuated by the advancing sheet, latching means for controlling the valve trip, also actuated by the advancing sheet adapted to release the valve trip only upon contemporaneous actuation, and having two points of latch engagement, one in advance of the other.

10. In a sheet feeding machine, the combination of sheet actuating means, valve controlled means for rendering the actuating means ineffective, a valve trip actuated by the advancing sheet, latches for controlling the valve trip actuated by the advancing sheet adapted to release the valve trip only upon contemporaneous actuation so positioned as to require a square presentation of the advancing edge of the sheet to secure said contemporaneous actuation.

11. In a sheet feeding machine, the combination of sheet actuating means, valve controlled means for rendering the actuating means ineffective, a valve trip actuated by the advancing sheet, latches for controlling the valve trip actuated by the advancing sheet adapted to release the valve trip only upon contemporaneous actuation so positioned as to require a square presentation of the advancing edge of the sheet to secure said contemporaneous actuation, said latches having two points of latching engagement one in advance of the other so as to require the squaring of the sheet twice before the valve trip actuation.

12. In a sheet feeding machine, the combination of sheet actuating mechanism, valve controlled means for rendering the mechanism ineffective, a valve trip controlled by the advancing sheet comprising downwardly projecting fingers actuating a common pivotally supported rod, latches for controlling said actuation also actuated by fingers encountered by the sheet.

13. In a sheet feeding machine, the combination of sheet actuating mechanism, valve controlled means for rendering the mechanism ineffective, a valve trip controlled by the

advancing sheet comprising downwardly projecting fingers actuating a common pivotally supported rod, latches for controlling said actuation also actuated by fingers encountered by the sheet, the parts disposed so as to require the actuation of all the latches before permitting the actuation of the valve trip.

14. In a sheet feeding machine, the combination of sheet actuating mechanism, valve controlled means for rendering the mechanism ineffective, a valve trip controlled by the advancing sheet comprising downwardly projecting fingers actuating a common pivotally supported rod, latches for controlling said actuation also actuated by fingers encountered by the sheet, the latches having two points of engagement one in advance of the other so as to require the actuation of all the latches at two different points in the advance of a sheet before the release of the valve trip.

15. In a sheet feeding machine, the combination of sheet actuating mechanism, trip controlled means for rendering said actuating mechanism ineffective, the trip adapted to be actuated by the advancing sheet, spring means for controlling the trip having its line of spring force to one side of the axis of movement of the trip when in the initial position, but adapted upon the preliminary actuation of the trip by the sheet to be carried into a neutral position with its line of force substantially intersecting said axis of movement of the trip as and for the purpose specified.

16. In a sheet feeding machine, the combination of sheet actuating mechanism, trip controlled means for rendering said actuating mechanism ineffective, the trip adapted to be actuated by the advancing sheet, spring means for controlling the trip having its line of spring force to one side of the axis of movement of the trip when in the initial position but adapted upon the preliminary actuation of the trip by the sheet to be carried into a neutral position with its line of force substantially intersecting said axis of movement of the trip and then adapted to be put under such tension as to impart to the moving parts such momentum as to return the mechanism into the initial position.

17. The combination of a sheet feeding machine, and a folding machine, a combing wheel, valve controlled means for disengaging the combing wheel from the sheet, a valve trip to be encountered by the advancing sheet, trip latches for controlling the valve trip adapted to be actuated by the advancing sheet simultaneously when the sheet is square, and a side registering device for acting on the sheet just before its delivery to the folding machine.

18. In a sheet feeding machine, the com-

5 bination of a single combing wheel, pneumatic means for rendering the combing wheel effective or ineffective, valve trips adapted to be actuated by the advancing edge of the sheet, for controlling the pneumatic means, and trip latches controlling the valve trips also adapted to be actuated

by the advancing edge of the sheet to release the valve trips only when the latches are actuated simultaneously.

HOWARD K. KING.

Witnesses:

MAE HOFMANN,
HOWARD S. OKIE.