

S. M. LANGSTON.
 CONTROLLER FOR SHEET FEEDING MECHANISM.
 APPLICATION FILED SEPT. 16, 1914.

1,174,739

Patented Mar. 7, 1916.
 2 SHEETS—SHEET 1.

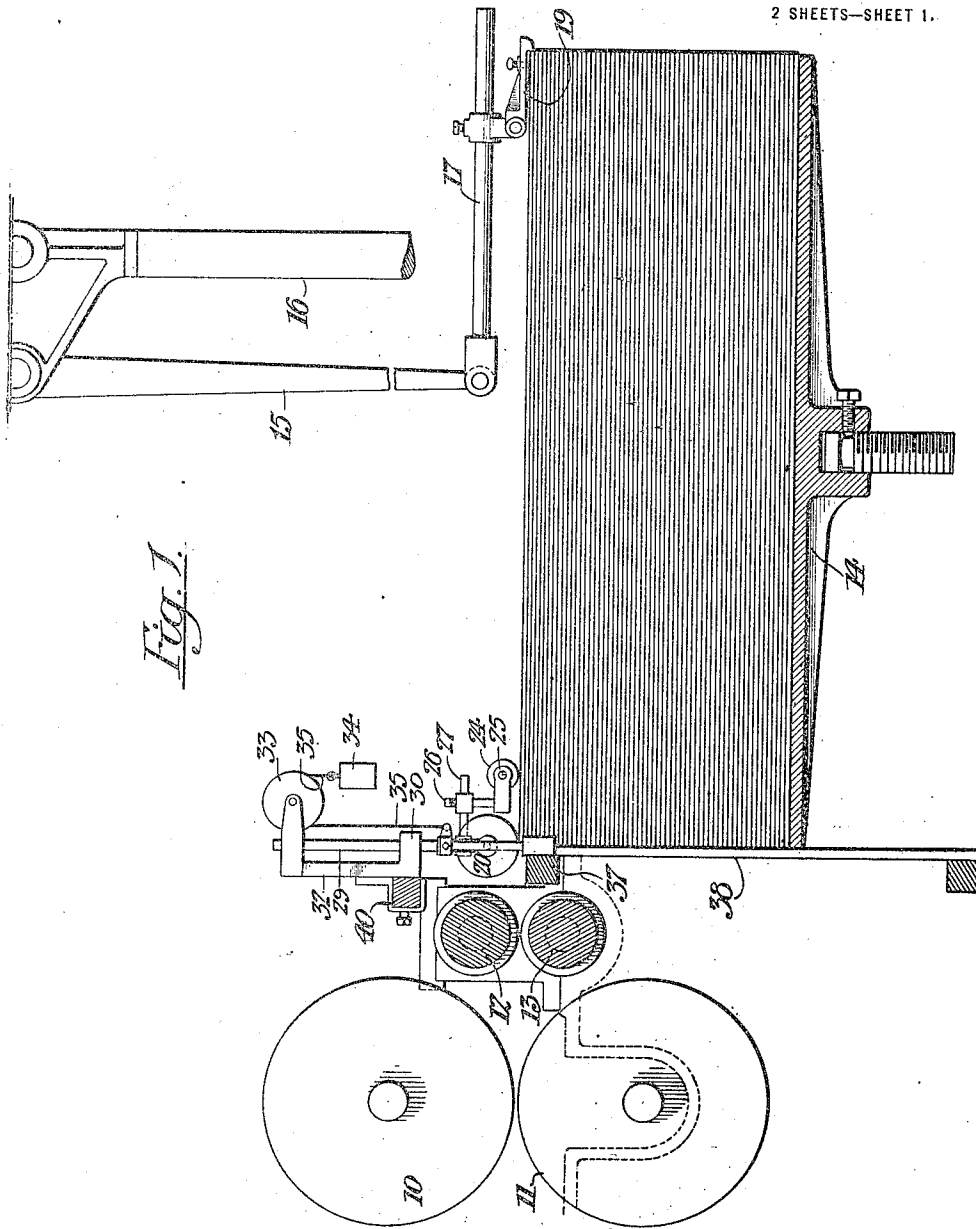


Fig. 1.

WITNESSES

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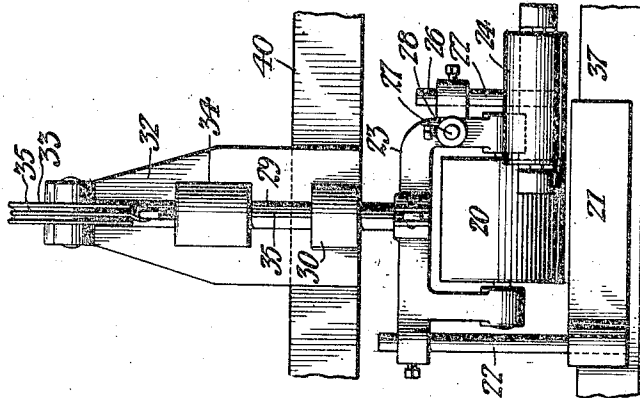


Fig. 3.

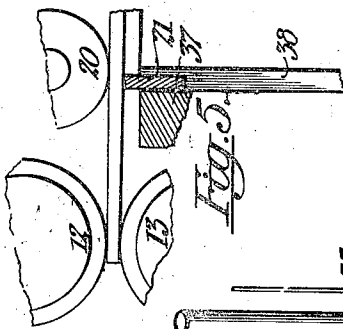


Fig. 5.

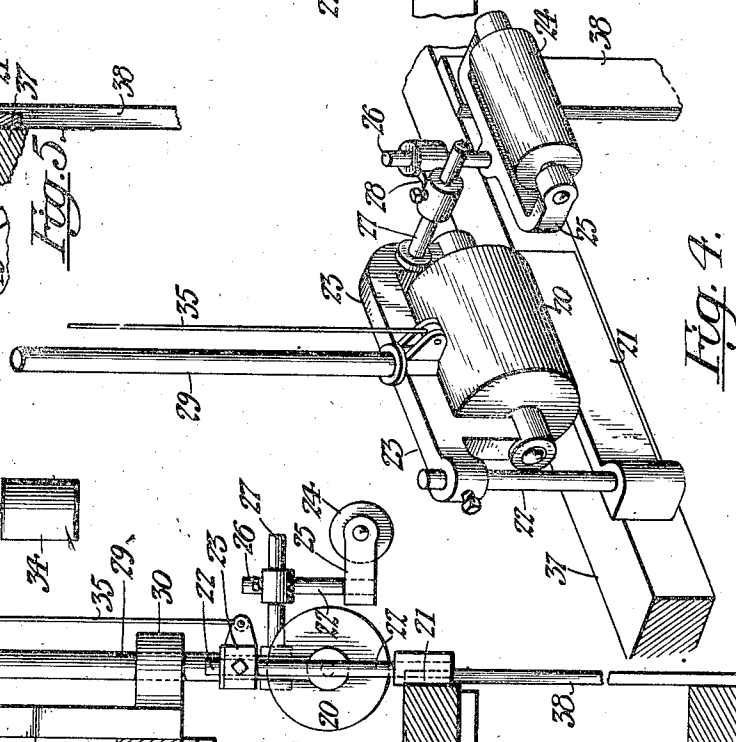
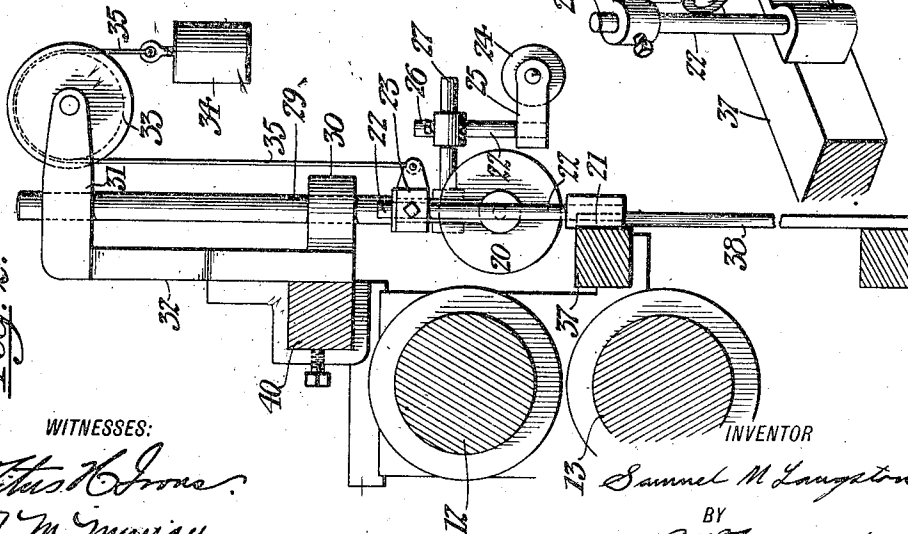


Fig. 4.

Fig. 2.



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CONTROLLER FOR SHEET-FEEDING MECHANISM.

1,174,739.

Specification of Letters Patent.

Patented Mar. 7, 1916.

Application filed September 16, 1914. Serial No. 662,068.

To all whom it may concern:

Be it known that I, SAMUEL M. LANGSTON, a citizen of the United States, and resident of Wenonah, in the county of Gloucester and State of New Jersey, have invented certain new and useful Improvements in Controllers for Sheet-Feeding Mechanism, of which the following is a specification.

My invention is intended for use in connection with the feeding mechanism of machines for receiving or performing such work as printing, lithographing, stenciling, cutting, scoring or the like upon the sheet material, and the main object of my invention is to provide a simple and automatically acting mechanism for positively preventing the delivery of more than a single sheet at a time.

As one important feature of my invention, I provide a gage including two spaced members, between which the successive sheets must pass, the distance between said members, in a direction normal to the plane of the sheet, being greater than the thickness of one sheet and less than the combined thicknesses of two superposed sheets.

As another important feature of my invention, I so mount the gage that it automatically assumes a position with the passageway for the sheet to be fed substantially in the plane of said sheet, even though the elevation of the latter vary as successive sheets are fed to the machine.

My invention is particularly applicable for feeding sheets from the top of a stack or column, where the bottom of the stack or column is either raised continuously during the feeding operation, or is raised intermittently at frequent intervals so as to maintain the top of the column at approximately, although not necessarily exactly, a predetermined level, bearing the desired relationship to the receiving end of the machine. When so used, the device includes as a part thereof, means engaging with, or controlled by the position of the top sheet of the column so as to maintain the gage members in the proper position opposite the edge of the top sheet, even though the latter being slightly above or below the mean position of the top of the column.

As another important feature of my invention, I place one of the gage members closer to the edge of the column than I do the other, and form the first mentioned mem-

ber with an inclined surface, and the latter with a shoulder substantially at right angles to the general direction of feeding movement of the sheet, so that the first mentioned member will guide the sheet or sheets toward the entrance opening between the gage members, while the other gage member will catch on the edge of a second sheet if more than one be advanced at the same time.

In its preferred embodiment, the device is supported, in whole or in part, by a member resting directly upon the top of the column to insure the proper positioning of the device. This supporting member and one of the gage members may be in the form of rollers so as to reduce to a minimum the friction encountered by the sheet in being fed to the machine, and if desired, one of the gage members itself may serve as the supporting member.

In the accompanying drawings, I have illustrated merely one embodiment of my invention, but inasmuch as a great variety of changes in the details of construction and in the relative arrangement of the parts may be made, I desire this form to be considered in an illustrative rather than a limiting sense.

In these drawings, to which reference is to be had, and in which similar reference characters indicate corresponding parts in the several views, Figure 1 is a side elevation of a portion of a machine having my improved device applied thereto; Fig. 2 is an end view of the device, substantially as shown in Fig. 1, but on a larger scale; Fig. 3 is a face view of the device; Fig. 4 is a perspective view of the floating parts; and Fig. 5 is a detail on a somewhat different scale and showing the operation of a portion of the device on sheets of somewhat exaggerated thickness.

My invention is particularly applicable for printing presses operating upon such thick sheets as paper, board or double-faced corrugated paper, although it is, of course, applicable to other kinds of sheets, irrespective of the material, particularly if such sheets have any considerable thickness or stiffness.

I have illustrated one form of my device in connection with a portion of a printing press including a type cylinder 10, an impression cylinder 11 and feed rollers 12 and 13. The sheets are illustrated as being supported, in the form of a stack or col-

umn, upon a platform 14, which is capable of being raised or lowered, and the feeding mechanism is illustrated as including an arm 15, pivotally supported at the upper end of a frame-part 16, and having a substantially horizontal rod 17 disposed above the top of the column and carrying a sheet removing hook 19.

I wish it distinctly understood that my present invention does not in any way involve the details of construction of the means for supporting the sheets prior to the time they are fed to the machine nor in the means for advancing successive sheets to the feed rollers.

The parts 15 and 19 inclusive may be constructed and operated substantially as is shown and claimed in my prior and co-pending application, Serial No. 853,012, filed July 25, 1914, and in actual practice I prefer to employ the column elevating mechanism there shown. The form here shown is merely a conventionally illustrated substitute therefor, but I reserve the right to illustrate and describe in this application any and all such parts of the mechanism shown in the application above referred to as may be necessary to the proper illustrating of efficient mechanism for raising the support for the column so as to maintain the top of the column at substantially the level of the feed rollers and for advancing sheets in succession from the top of the column to the feed rollers.

In the illustrated embodiment of my invention, I employ two gage members 20 and 21, spaced apart vertically a distance slightly in excess of the thickness of one sheet and less than the combined thicknesses of two superposed sheets. As shown, the member 20 is in the form of a roller, having its axis substantially parallel to the advancing edge of the sheet to be fed, and so mounted that its lower surface comes substantially in, or very slightly below, the level of the upper surface of the top sheet of the column. The other member 21 presents a surface substantially parallel to the front side of the column and at right angles to the general direction of delivery of the sheets. The distance between the two members is adjustable and may be set in accordance with the thickness of the sheet material being fed. As shown, the member 21 has an upwardly extending post or bar 22 supporting a bracket 23, having hangers between which the roller 20 is mounted. The bracket 23 and post 22 may be secured in the desired adjusted position in any suitable manner, as for instance, by a set-screw. The axis of the roller is adjacent to the plane of the front surface of the member 21, so that a portion of the roller projects toward the column in advance of said surface. This projecting portion 65 presents a downwardly and rearwardly in-

clined, curved, under surface, against which successive sheets may engage, and by which said sheets may be guided downwardly so as to pass beneath the roller, and over the lower gage member 21. The roller being free to turn, presents very little, if any frictional resistance to the guided movement of the sheet.

For insuring the proper position of the two gage members, the projecting portion of the upper gage member may and preferably does rest on the top of the column so as to support the device. I may provide a separate and additional supporting member 24, preferably in the form of a roller, mounted to rest upon the upper surface of the top sheet of the column but this may be entirely omitted if desired. This roller is illustrated as being mounted between the arms of a bracket 25, and the latter is adjustable both vertically and toward and from the bracket 23 by any suitable means, such for instance, as two rods 26 and 27, rigid with the two brackets, and connected together by a combined collar slidable along each of the rods, and normally held rigid by suitable set-screws. The gage members being rigidly connected and supported by the stack are caused to assume a position directly dependent upon the position of the sheet being fed, and are forced to rise or fall with variations in the elevation of the sheet to be fed, or which is being fed.

To reduce to a minimum the frictional resistance encountered by the supporting of the parts on the top of a sliding sheet, I preferably partially support the parts by a counterbalancing weight. As shown, the bracket 23 has a vertically extending rod 29 rigid therewith, and this is free to move vertically in guiding apertures in the arms 30 and 31 of a bracket 32 rigidly supported on the machine. A counterbalancing weight 34 may be connected to gage members by a cord 35 passing over a pulley 33 on the arm 31. The mass of the weight should be so proportioned to that of the other parts that a comparatively small portion of the total weight of the parts is borne by the sheet, but at the same time the roller 24 will bear down on the sheet sufficiently to insure the proper raising and lowering of the gage members with variations in the elevation of the top surface of the column.

In practice, I may, and preferably do, provide two separate devices, engaging with the top sheet adjacent to the opposite side edges of the latter. The devices may operate independently so that a higher lever at one side of the top of the column than at the other side will not interfere with the proper feeding of the sheets, and any warping or twisting of the sheets will be properly taken care of. If desired, the devices at opposite sides of the machine may be rigidly con-

connected so as to be raised or lowered simultaneously.

For engaging with the front edge of all the sheets of the column to hold said sheets in proper stacked relationship and thus prevent any of the sheets from sliding forward and getting beneath the member 21, I provide a transverse bar 37 secured to the frame of the machine and carrying a series of depending fingers 38 which may be in the form of slats. These slats may be connected together at their lower ends by another bar similar to the bar 37. The slats are preferably thicker than the member 21 so that the latter may freely move up and down between the bar 37 and the edges of the sheets.

The two pair of gages may be adjusted toward and from each other, in accordance with the width of the sheets being fed. This may be very easily accomplished by sliding the brackets 32 lengthwise along the bar 40, which supports them. The ends of this bar may be rigidly mounted on the frame of the machine; for instance, in the same way as the bar 19, shown in my prior Patent, No. 1,107,971, granted August 18, 1914.

The particular form of my device which I have seen fit to illustrate is designed for use in connection with a stack or column of sheets, from which successive sheets are fed off the top. It is, of course, evident that the device might be readily re-designed so as to operate in connection with a machine in which the successive sheets are fed from the bottom instead of from the top of the stack or in which they are removed from a stack and delivered to the device by hand. If the feeding be from the bottom, the roller 20 would be below instead of above the member 21, and as the bottom of the stack would ordinarily rest upon a stationary support, the roller 24 might be omitted and the device secured directly to said support. Both in such a device and in the specific device illustrated, the roller 20 might be replaced by a member similar to the member 21 or by a non-rotatable member presenting a straight or curved inclined surface, and the roller 24 might be replaced by any suitable form of shoe mounted to rest on the top of the stack and permit the sliding of the sheet thereunder without injury to said sheet. If the inclined under surface of the member 20 be sufficiently long and the members 20 and 21 be spaced a sufficient distance from the edge of the sheet, it is evident that the two members 20 and 21 can be properly positioned in respect to the feed rollers and be rigidly supported, and thus the counterbalancing weight and the roller 24 might be omitted.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In combination, means for supporting

a stack or column of sheets and means for delivering sheets from said stack or column and a pair of spaced gage members between which said sheets may pass in succession, one of said members being in the form of a roller, free to be rotated by the sheets as they pass between the gage members.

2. An attachment for sheet feeding mechanism, including a pair of gage members, one of said members being in the form of a freely rotatable roller with its axis of rotation adjacent to the plane of the advance side of the other member.

3. An attachment for sheet feeding mechanism, including a pair of gage members, one of said members being in the form of a freely rotatable roller with its axis of rotation adjacent to the plane of the advance side of the other member, and means for automatically maintaining said members with a passage there-between substantially in the plane of the sheet to be fed.

4. An attachment for sheet feeding mechanism including a pair of gage members, one of said members being in the form of a roller with its axis of rotation adjacent to the plane of the advance side of the other member, and means for automatically maintaining said members with a passage there-between substantially in the plane of the sheet to be fed, said means including a member adapted to rest upon and be supported by the sheet to be fed.

5. In combination, a lower gage member, a roller spaced therefrom and adjustable toward and from the latter and a support for said members adapted to rest upon an article to be fed between said members.

6. In combination, means for supporting a stack of sheets, a roller adapted to rest upon the top sheet of the stack and a pair of gage members at one side of the stack and spaced apart a distance in excess of the thickness of one sheet and less than the combined thickness of two sheets between which a sheet may pass, said gage members being supported by said roller.

7. In combination, means for supporting a column of sheets and elevating said column to maintain the top approximately at a predetermined level, a gage member at one side of the column and a roller for said gage member, said roller resting upon the top of the column and maintaining said gage member with its upper edge opposite to the edge of the next to the top sheet to prevent the latter from being fed from the column with the top sheet.

8. In combination, a pair of feed rollers, a support for a stack of sheets, said support being vertically adjustable to maintain the top of the stack at an approximately constant level, a gage member interposed between said rollers and said stack, a roller mounted on said stack and serving as a

support for said gage member and a member presenting an inclined surface and serving to guide the top sheet of said stock over said gage member and preventing the under surface of said sheet from being spaced above said gage member a distance in excess of the thickness of the sheet.

9. In combination, a pair of feed rollers, a support for a stack of sheets, said support being vertically adjustable to maintain the top of the stack at an approximately constant level, a gage member interposed between said rollers and said stack, a roller mounted on said stack and serving as a support for said gage member and a second roller serving to guide the top sheet of said stack over said gage member and preventing the under surface of said sheet from being spaced above said gage member a distance in excess of the thickness of the sheet.

10. In combination, a pair of feed rollers mounted at a fixed elevation, a support for a column of sheets and vertically movable to maintain the top of the column at a substantially constant elevation, means for feeding sheets from the top of said column to said feed rollers and a controlling device for preventing the delivery of more than a single sheet at a time, said device including a pair of spaced gage members intermediate of said rollers and said column, and a counterbalancing weight for supporting said members and permitting the vertical and bodily movement of the latter in respect to the feed rollers, the upper of said members engaging with the top sheet of the column for controlling the vertical movement of said gage members.

11. In combination, a pair of feed rollers, a support for a column of sheets and vertically movable to maintain the top of the column at a substantially constant elevation, means for feeding sheets from the top of said column to said feed rollers and a controlling device for preventing the delivery of more than a single sheet at a time, said device including two independent pairs of spaced guide members adjacent to opposite corners of the column and between said column and said feed rollers, means extending from one gage member of each pair to the corresponding gage member of the other pair and serving to prevent the passage of sheets beneath said gage members.

12. In combination, a pair of feed rollers, a support for a column of sheets and vertically movable to maintain the top of the column at a substantially constant elevation,

means for feeding sheets from the top of said column to said feed rollers and means for preventing the delivery of more than a single sheet at a time, said means including two separate pairs of spaced guide members adjacent to opposite corners of the column and between said column and said feed rollers and independently supported by said column, and a series of vertically disposed slats engaging with the edge of the stack and preventing movement of sheets beneath said means.

13. In combination, a pair of feed rollers, a support for a column of sheets vertically movable to maintain the top of a column at a substantially constant elevation, means for feeding sheets from the top of said column to said feed rollers and means for preventing the delivery of more than a single sheet at a time, said means including two independent pairs of adjustably connected gage members at the two front corners of the column, each being vertically movable and independently supported from the top of said column.

14. In combination, a pair of feed rollers, a support for a column of sheets vertically movable to maintain the top of a column at a substantially constant elevation, means for feeding sheets from the top of said column to said feed rollers and means for preventing the delivery of more than a single sheet at a time, said means including two independent pairs of adjustably connected gage members at the two front corners of the column, each being vertically movable and independently supported from the top of said column, a pulley above each pair of gage members, a cord extending from each pair over its corresponding pulley and separate counterbalancing weights connected to said cords.

15. In combination, means for supporting a stack or column of sheets, means for delivering sheets from said stack or column, and means for preventing the delivery of more than a single sheet at a time, said means including two independent pairs of adjustably connected gage members at the two front corners of the column, each being vertically movable and independently supported from the top of said column.

Signed at New York city in the county of New York and State of New York this 14th day of September A. D. 1914.

SAMUEL M. LANGSTON.

Witnesses:

C. W. FAIRBANK.
FLORENCE LEVIEN.