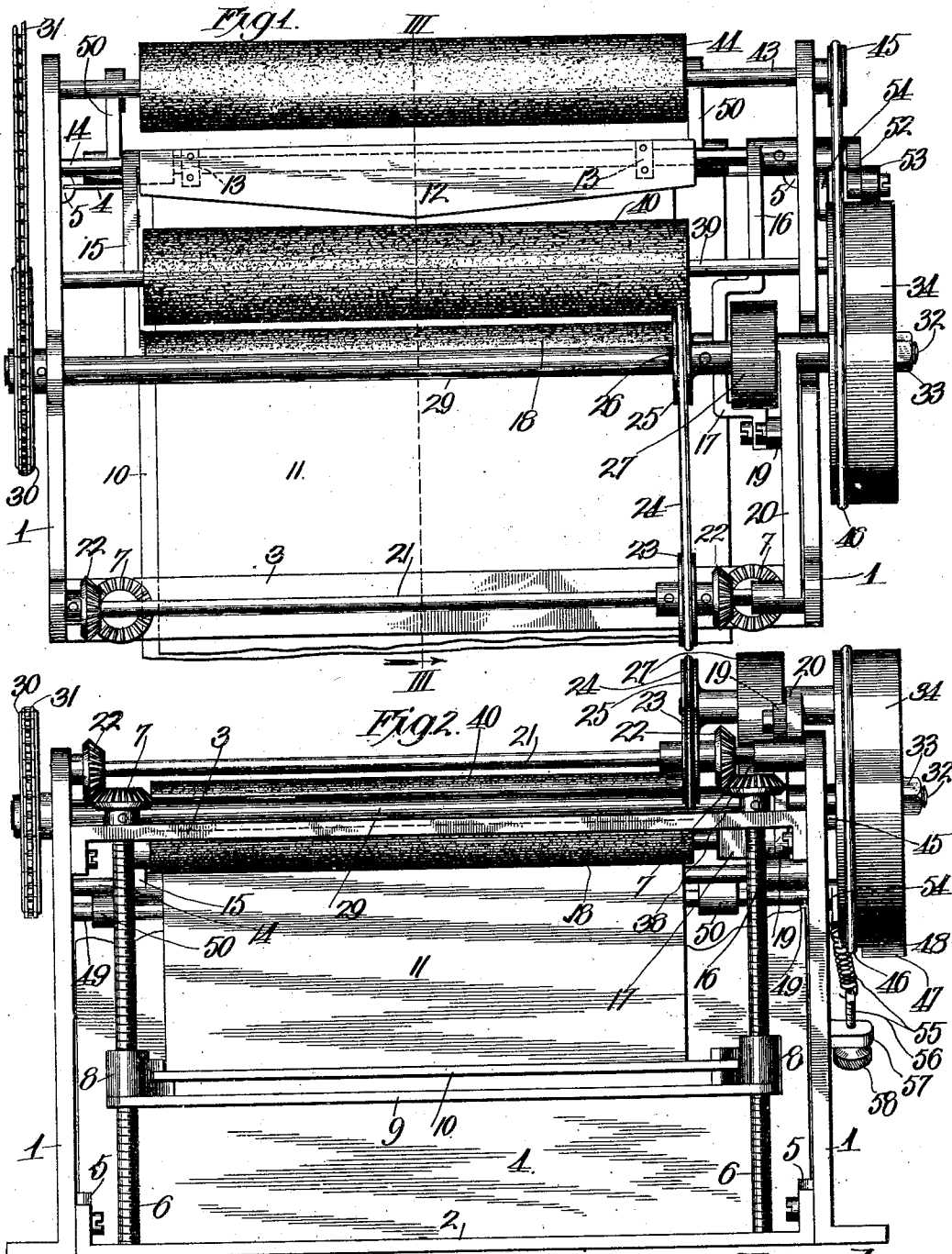


G. B. MAEGLY.
PAPER FEEDING MACHINE.
APPLICATION FILED FEB. 6, 1909.

938,006.

Patented Oct. 26, 1909.

2 SHEETS—SHEET 1.



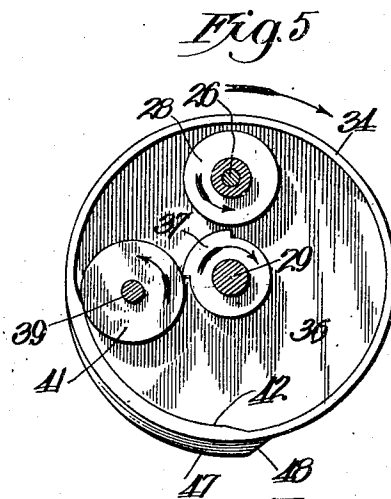
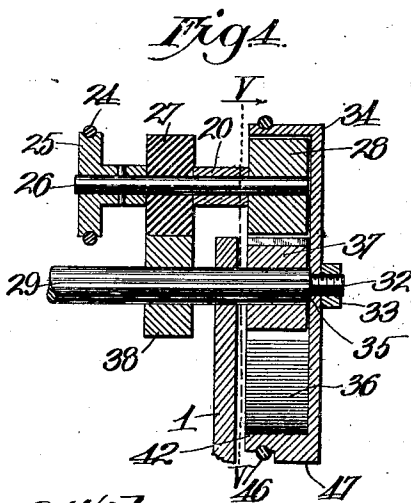
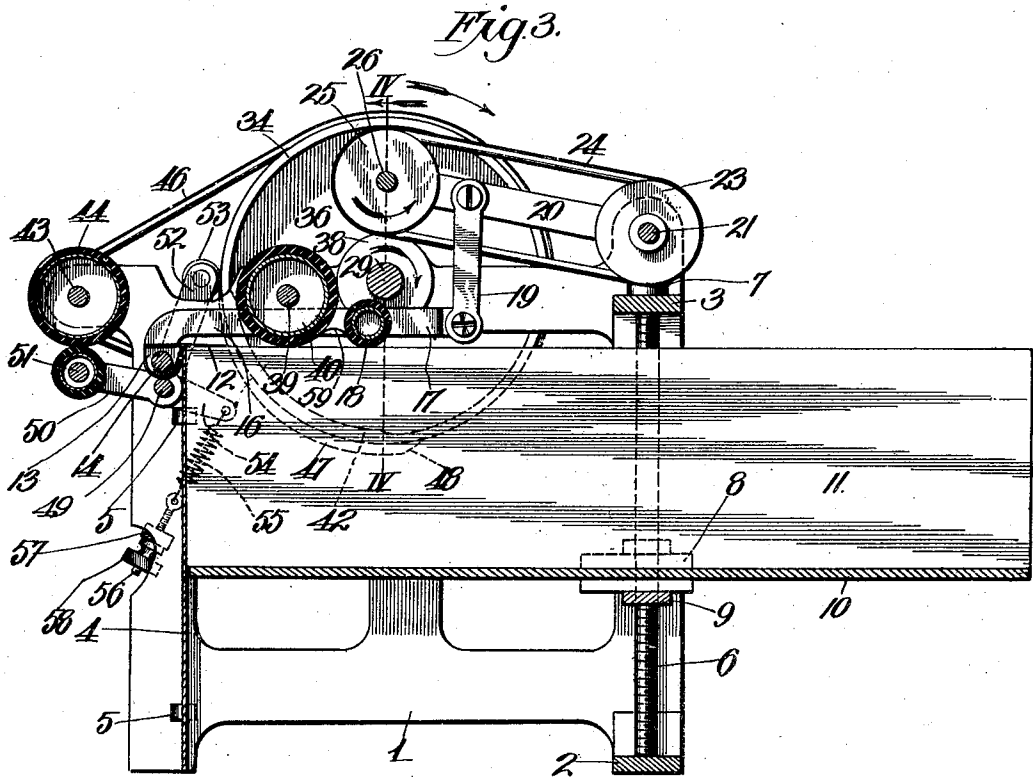
Witnesses
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By *Wm. H. Sharp* Atty.

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Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE B. MAEGLY, OF KANSAS CITY, MISSOURI.

PAPER-FEEDING MACHINE.

938,006.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed February 6, 1909. Serial No. 476,390.

To all whom it may concern:

Be it known that I, GEORGE B. MAEGLY, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Paper-Feeding Machines, of which the following is a specification.

This invention relates to paper feeding machines of that class which successively removes sheets or envelops from a stack and feeds them one after another, to the point desired, my object being to produce a machine of the character outlined, which operates efficiently and reliably, which is equipped for use with sheets of varying length, width and thickness, and which is of simple, compact, strong, durable, and inexpensive construction.

To this end the invention consists in certain novel and peculiar features of construction and combinations of parts as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which:

Figure 1, is a top plan view of the major portion of a paper feeding machine embodying my invention. Fig. 2, is a rear view of the same. Fig. 3, is a section on the line III—III of Fig. 1. Fig. 4, is a fragmentary section on the line IV—IV of Fig. 3. Fig. 5, is a section on the line V—V of Fig. 4.

In the said drawings, 1 indicates a frame of the type shown or of any other suitable or preferred type, adapted to be secured upon a table or other support.

2 and 3 indicate cross bars at the rear end of said frame, and 4 indicates a vertical plate extending from side to side of the frame and secured by preference in bifurcated lugs 5 projecting inwardly from the side of the frame, the upper edge of plate 4 terminating below the horizontal plane of cross bar 3, and journaled in cross bars 2 and 3 are vertical screws 6 equipped at their upper ends with bevel-gears 7 and engaging threaded collars 8 connected rigidly together by cross-bar 9, said collars rigidly carrying a horizontal plate 10 extending from a point adjacent to plate 4 to a point, a suitable distance rearward of the screws and in conjunction with the collars, forming an elevator for a stack of paper sheets 11, which at their front ends fit squarely against the front plate 4 and at such front end are over-

lapped by a rearwardly-projecting and tapering lip 12 having depending lugs 13 forward of plate 4 and journaled on a transverse rock-shaft 14 journaled in the sides of the frame.

15 and 16 indicate arms projecting rearward from rock-shaft 14 and constitute in conjunction with the same, a rock-frame, said arms being disposed by preference at opposite sides of the stack of sheets, and one of them—viz. arm 16—in the organization shown, being bowed or bent inwardly as at 17 to avoid conflict with a wheel hereinafter referred to, and carried by and bearing a journaled relation to said arms is a rubber or equivalent tired governing roll 18 resting upon the topmost sheet of the stack. The rear end of arm 16 is connected pivotally by a link 19 with a swing-arm 20 pivoted at its rear end on a transverse shaft 21 journaled in the sides of the frame and equipped with a pair of bevel-gears 22 meshing with bevel-gears 7. Shaft 21 is also provided with a grooved belt-wheel or pulley 23 connected by a belt 24 to a similar pulley 25 rigidly secured on the end of a short shaft 26 journaled in the front end of swing-arm 20, and equipped at the inner and outer sides of said arm with friction rolls 27 and 28 respectively, roll 27 being preferably of slightly greater diameter than roll 28.

Vertically under shaft 26 and journaled in the sides of the frame below the rock-frame hereinbefore described, is a drive-shaft 29, provided at one end with a sprocket-wheel 30 engaged by a drive-chain 31. The opposite end of said shaft is formed with a reduced bolt extension 32, and engaging the latter is a nut 33 clamping a chambered-wheel 34 against the shoulder 35 produced at the junction of the body-portion of shaft 29 and its bolt-extension, the chamber 36 of said wheel being circular and receiving friction roll 28 and friction segment 37 bearing a rigid relation to drive-shaft 29 and wheel 34, of which latter wheel it may form the hub, and also rigid with said shaft and underlying and adapted at times to be engaged by friction-roll 27 is a friction-wheel 38.

39 is a transverse shaft journaled in the sides of the frame sufficiently above the rock-frame to avoid interference with the latter, and secured on said shaft and bearing on the topmost sheet of the stack between the arms of the rock-frame is a rubber or equivalent

tired sheet advancing and buckling roller 40, said shaft being also equipped with a friction-roll 41 occupying the chamber of wheel 34 and adapted to be alternately turned in
5 opposite directions by the convex friction segment 37 and the concave friction segment 42 of the chambered wheel.

Journalled in the sides of the frame forward and above the plane of the lip 12 is a
10 transverse shaft 43 equipped with a feed-roll 44 and with a belt-pulley 45 connected by a belt 46 with wheel 34, and said wheel is provided externally with a segmental cam 47 which merges into the periphery of said
15 wheel in substantially the radial plane of the front end of segment 42, and terminates in a substantially abrupt incline 48 slightly rearward with respect to the direction of rotation of said concave segment.

20 49 is a transverse rock-shaft journalled in the sides of the frame below the rock-shaft 14 by preference, and projecting forwardly from said shaft is a pair of arms 50 forming a journal for the shaft and feed roll 51 under-
25 lying roll 44. Shaft 49 is also provided with an upwardly-projecting arm 52 equipped with an anti-friction roll 53 peripherally engaging wheel 34 in the vertical plane of cam 47 thereof, and in order to hold roll 51
30 pressed yieldingly against the overlying co-operating roll 44, arm 52 is provided with a rearwardly-projecting arm 54 connected by a spring 55 to a screw-rod 56 extending
35 slidingly through an outwardly-projecting perforated lug 57 and engaged at its lower end by a thumb-nut 58 bearing upon said lug and adapted when turned in one direction or
40 the other to move said rod endwise to vary the tension of spring 55 and increase or diminish the yielding pressure of roll 51 against roll 44.

Assuming that the elevator is charged with a stack of paper and that the topmost sheet is in the plane of, and in frictional
45 engagement with rolls 18 and 40, as indicated in Fig. 3, and that the drive-shaft 29 and the parts rigid therewith are turning in the direction indicated by the arrow adjacent to said shaft, it will be seen that the
50 convex segment 37 (Fig. 5) will engage friction roll 41 and turn the same and roll 40 backward in the direction indicated by the arrow on roll 41 and as a result roll 40 will withdraw the front end of the topmost
55 sheet from under lip 12, buckling the sheet as shown at 59. As soon as the segment 37 passes out of engagement with roll 41 the said movement and buckling of the sheet terminates, leaving roll 40 free to be
60 turned in the opposite direction. At substantially the same instant the concave segment 42 comes into engagement with the opposite side of the friction roll 41, reversing the motion of the same and roll 40, thus un-
65 buckling or restraightening the sheet and

disposing its front end upon lip 12. The continued or uninterrupted forward rotation of roll 40 advances the front end of the sheet beyond the lip 12, but at a much greater
70 speed and until segment 42 passes out of engagement with friction roll 41, which again leaves roll 40 idle, the advantage of which is hereinafter explained. At practically the instant the forward rotation of roll 40 or the unbuckling movement begins, cam 47 comes
75 into engagement with anti-friction roll 53, and, overcoming the yielding resistance of spring 55, rocks shaft 49 and thus separates rolls 44 and 51 by lowering the latter, the said rolls occupying this spaced or separated
80 relation while the forwardly advancing sheet is being interposed between them, and until cam 47 passes out of engagement with anti-friction roll 53, at which time the re-
85 tractive action of spring 55 causes roll 51 to press against the sheet interposed between it and the roll 44. At this time, friction roll 41 being out of engagement with segments 37 and 42, roll 40 is left free to revolve and offers no resistance to the forward move-
90 ment of the sheet which is advanced by the coöperating feed rolls 44 and 51 as described.

Roll 18 of the rock-frame governs the plane of the top of the stack—that is to say—as long as the top of the stack main-
95 tains an operative relation to roll 40, the elevator remains stationary, because through the link 19, friction roll 27 is held out of engagement with the drive friction wheel 38, and as a result shaft 26 transmits no
100 movement to belt 24, wheel 23, and shaft 21, and hence through the bevel-gearing described, to the screws 6. The instant however, through the removal of one or more of the sheets, the top of the stack is lowered
105 a distance sufficient to disturb the operative relation between such stack and roll 40, the rock-frame swings downward allowing friction-roll 27 to come into engagement with the friction wheel 38 (see Fig. 4), and as a result the former is rotated in the direction
110 indicated by the arrow on pulley 25 of Fig. 3, and thus through the belt 24 and pulley 23, rotates shaft 21 in the same direction; the latter through the bevel-gearing described, turning screws 6 and raising the ele-
115 vator and the stack of paper thereon; this elevation of the stack through governing roll 18, raising the rock-frame and through the link 19 the swing-arm 20, until friction-
120 roll 27 is again out of engagement with the friction-wheel 38, at which time the top of the stack is again in operative relation to roll 40, it being understood in this connection that the movement of the rock-frame
125 and the swing-arm is so slight as to be practically imperceptible to the eye.

It will be seen that the machine is entirely automatic in its action; and that the sheets of paper are withdrawn one at a time and
130

in rapid succession from the stack. When all of the sheets have been withdrawn from the elevator, the latter is lowered to the desired position by raising the swing-arm 20 upward until friction-roll 28 comes into engagement with the inner face of the rim of the chambered wheel 34, which drives said friction roll rapidly in the reverse direction to that described, and thus reverses the rotation of the screws and effects the lowering of the elevator, it being noticed in this connection that each time the concave segment comes into engagement with roll 28, the swing-frame is depressed slightly but without interrupting such reverse rotation of said roll, and hence without arresting the lowering of the elevator.

This paper feeding machine is adapted to be used in conjunction with printing presses, folding machines, ruling machines, or machines of any type to which sheets of paper or envelops are adapted to be fed.

From the above description it will be apparent that I have produced a paper feeding machine embodying the features of advantage enumerated as desirable and which is obviously susceptible of modification in various particulars without departing from the spirit and scope, or sacrificing any of the advantages of the appended claims.

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

1. In a paper feeding machine, a suitable frame, a bed carried thereby to carry a stack of flexible sheets, a sheet-buckling and unbuckling roll extending transversely across and engaging the topmost sheet of said stack, means extending transversely across the stack and engaging the topmost sheet contiguous to and parallel with said sheet-buckling and unbuckling roll and exerting a yielding downward pressure on said sheet, a driven shaft, a pair of segments rotatable therewith, and a roller rotatable with said sheet-buckling and unbuckling roll, alternately engaged and rotated in opposite directions by said segments.

2. In a paper feeding machine, a suitable frame, a bed carried thereby to carry a stack of flexible sheets, a sheet-buckling and unbuckling roll extending transversely across and engaging the topmost sheet of said stack, means extending transversely across the stack and engaging the topmost sheet contiguous to and parallel with said sheet-buckling and unbuckling roll and exerting a yielding downward pressure on said sheet, a driven shaft, a convex segment and a concave segment, means for rotating said segments in the same direction, and a friction roll rotatable with the sheet-buckling and unbuckling roll and adapted to be alternately engaged and rotated in opposite directions by said segments.

3. In a paper feeding machine, a suitable frame, a bed carried thereby to carry a stack of flexible sheets, a sheet-buckling and unbuckling roll extending transversely across and engaging the topmost sheet of said stack, means extending transversely across the stack and engaging the topmost sheet contiguous to and parallel with said sheet-buckling and unbuckling roll and exerting a yielding downward pressure on said sheet, a driven shaft, a convex segment and a materially longer concave segment rotating in the same direction and bearing a concentric relation with said convex segment, and a friction roll interposed between said segments and rotatable with said sheet-buckling and unbuckling roll and adapted to be alternately engaged at opposite sides of its axis and rotated in opposite directions by said segments.

4. In a paper feeding machine, a suitable frame, a bed carried thereby to carry a stack of flexible sheets, a sheet-buckling and unbuckling roll extending transversely across and engaging the topmost sheet of said stack, means extending transversely across the sheet and engaging the topmost sheet contiguous to and parallel with said sheet-buckling and unbuckling roll and exerting a yielding downward pressure on said sheet, a driven shaft, a convex segment and a materially longer concave segment rotating in the same direction and bearing a concentric relation with said convex segment, a friction roll interposed between said segments and rotatable with said sheet-buckling and unbuckling roll and adapted to be alternately engaged at opposite sides of its axis and rotated in opposite directions by said segments, and a pair of feed-rolls forward of the sheet-buckling and unbuckling roll and adapted to receive between them the front end of the sheet after the same has been unbuckled or restraughtened.

5. In a paper feeding machine, a suitable frame, a bed carried thereby to carry a stack of flexible sheets, a sheet-buckling and unbuckling roll extending transversely across and engaging the topmost sheet of said stack, means extending transversely across the stack and engaging the topmost sheet contiguous to and parallel with said sheet-buckling and unbuckling roll and exerting a yielding downward pressure on said sheet, a driven shaft, a convex segment and a materially longer concave segment rotating in the same direction and bearing a concentric relation with said convex segment, a friction roll interposed between said segments and rotatable with said sheet-buckling and unbuckling roll and adapted to be alternately engaged at opposite sides of its axis and rotated in opposite directions by said segments, a pair of feed-rolls, means to separate said feed-rolls and yielding means for

causing them to engage opposite sides of the sheet of paper after the same has been unbuckled or restraightened.

6. In a paper feeding machine, a convex segment and a concentrically-arranged and longer concave segment rotating together, a journaled friction roll between the two segments and adapted to be turned backward by the convex segment and forward by the concave segment immediately after its backward movement is completed, a sheet-buckling and unbuckling roll rotatable with the friction-roll, means rearward of the sheet-buckling and unbuckling roll and adapted also to receive the pressure of said sheet, and between which and the last-named roll it is adapted to be buckled by said roll, the reverse movement of the latter unbuckling the sheet and advancing it, a pair of feed-rolls, means tending to press said feed-rolls yieldingly together, means movable with the segments separating said pair of feed-rolls and holding them separated until the sheet of paper is fed between them by the sheet-buckling and unbuckling roll, and means for causing said pair of feed-rolls to frictionally engage opposite sides of said sheet after said concave segment passes out of engagement with said friction roll.

7. In a paper feeding machine, a suitable frame, a driven shaft journaled therein, a pair of friction wheels rotatable with said shaft, a swing-arm suitably supported, a shaft journaled thereon, means whereby said shaft shall be alternately driven in opposite directions by said friction wheels, an elevator, means resting upon a stack of paper carried by the elevator and connected to the swing-arm to hold the latter with its shaft in inoperative relation to said friction wheels when the top of the stack occupies a predetermined plane and to permit said swing-arm to dispose its shaft in operative relation to one of said friction wheels when the top of the stack is below said predetermined plane, and means whereby the elevator is raised when the shaft of the swing-arm is driven in one direction, and lowered when driven in the opposite direction.

8. In a paper feeding machine, a suitable frame, a driven shaft journaled therein, a pair of friction wheels rotatable with said shaft, a swing-arm suitably supported, a shaft journaled thereon, a pair of friction rolls rotatable with the last-named shaft, an elevator, means resting upon the top of a stack of paper carried by the elevator and connected to the swing-arm to hold the latter with its friction rolls in inoperative relation to said friction wheels when the top of the stack occupies a predetermined plane and to permit said swing-arm to dispose one of its friction rolls in operative relation to one of said friction wheels when the top

of the stack is below said predetermined plane, and means whereby the elevator is raised when the friction rolls of the swing-arm are driven in one direction, and lowered when driven in the opposite direction.

9. In a paper feeding machine, a suitable frame, a driven shaft journaled therein, a pair of friction wheels rotatable with said shaft, a swing-arm suitably supported, a shaft journaled thereon, a pair of friction rolls rotatable with the last-named shaft, an elevator, means resting upon the top of a stack of sheets of paper carried by the elevator and connected to the swing-arm to hold the latter with its friction rolls in operative relation to said friction wheels when the top of the stack occupies a predetermined plane, and to permit said swing-arm to dispose one of its friction rolls in operative relation to one of said friction wheels when the top of the stack is below said predetermined plane, a plurality of similar screws, threaded sleeves engaging the same and carrying said elevator, a shaft suitably journaled and geared to said screws, and means for transmitting motion in one direction or the other from the shaft of the swing-arm to the shaft geared to said screws.

10. In a paper feeding machine, a suitable frame, a driven shaft journaled therein, a friction wheel rotatable therewith, a second and larger friction wheel provided with a circular chamber, rotatable therewith, a swing-arm suitably supported and provided with a pair of friction rolls, one within said chamber and the other overlying the first-named wheel, means resting upon the stack of paper and connected to the swing-arm to hold the latter with its friction rolls out of engagement with the friction wheels when the top of the stack occupies a predetermined plane and to permit one of said friction rolls to engage the first-named friction wheel when the top of the stack is below said predetermined plane, an elevator, and means whereby the elevator is raised by the engagement of the first-named friction wheel with one of said friction rolls, and lowered when the other friction roll is caused to engage the other friction wheel.

11. In a paper feeding machine, a suitable frame, a vertically movable elevator to carry a stack of paper, a lip overlapping the front end of the stack, a driven shaft journaled in the frame, a pair of segments rotating therewith, a friction roll adapted to be alternately engaged and rotated in opposite directions by said segments, a sheet-buckling and unbuckling roll rotatable with the friction roll and extending transversely across and engaging the topmost sheet of the stack of paper, and adapted when rotated in one direction to withdraw the front end of said sheet from under the lip and when rotated in the opposite direction to dispose said end

of sheet upon the lip, and a transverse roll contiguous to and engaging the topmost sheet of the stack behind said sheet-buckling and unbuckling roll to cause said sheet when the last-named roll is rotated backward to buckle upward between it and said roll.

12. In a paper feeding machine, a suitable frame, a vertically movable elevator to carry a stack of paper, a lip overlapping the front end of the stack, a driven shaft journaled in the frame, a pair of segments rotating therewith, a friction roll adapted to be alternately engaged and rotated in opposite directions by said segments, a sheet-buckling and unbuckling roll rotatable with the friction roll and extending transversely across and engaging the topmost sheet of the stack of paper and adapted when rotated in one direction to withdraw the front end of said sheet from under the lip, and when rotated in the opposite direction to dispose such end upon the lip, a transverse roll contiguous to and engaging the topmost sheet of the stack behind said sheet-buckling and unbuckling roll to cause said sheet when the last-named roll is rotated backward to buckle upward between it and said roll, and a pair of co-operating feed-rolls in front of the sheet-buckling and unbuckling roll to receive the sheet and continue its advancement.

13. In a paper feeding machine, a suitable frame, a vertically movable elevator to carry a stack of paper, a lip overlapping the front end of the stack, a driven shaft journaled in the frame, a pair of segments rotating therewith, a sheet-buckling and unbuckling roll, a friction roll rotatable with the sheet-buckling and unbuckling roll and adapted to be alternately engaged and rotated in opposite directions by said segments, and means also engaging the topmost sheet of the stack behind said sheet-buckling and unbuckling roll to cause said sheet when the last-named roll is rotated backward to buckle upward between it and said roll, a pair of friction wheels rotatable with the driven shaft, a swing-arm to move downward with said means when the top of the stack is below a predetermined plane, a shaft journaled in the swing-arm at its free end, a pair of fric-

tion rolls mounted thereon, one being adapted to be engaged by one of said friction wheels when the top of the stack is below a predetermined plane, and the other by the other friction wheel when the swing-arm is raised a sufficient distance, and means whereby the rotation of the shaft of the swing-arm will effect the upward or downward movement of the elevator and the stack carried thereon.

14. In a paper feeding machine, a suitable frame, a vertically movable elevator to carry a stack of paper, a lip overlapping the front end of the stack, a driven shaft journaled in the frame, a pair of segments rotatable therewith, a friction roll adapted to be alternately engaged and rotated in opposite directions by said segments, a sheet-buckling and unbuckling roll rotatable with the shaft, and engaging the topmost sheet of the stack, means also engaging said sheet behind said sheet-buckling and unbuckling roll to cause said sheet when the last-named roll is rotated backward to buckle upward between it and said roll, a pair of friction wheels rotatable with the driven shaft, a swing-arm linked to said means to be lowered when the top of the stack attains a position below a predetermined plane, a shaft journaled on the swing-arm at its free end, a pair of friction rolls mounted thereon, one being adapted to be engaged by one of said friction wheels when the top of the stack is below a predetermined plane and the other by the other friction wheel when the swing-arm is raised a sufficient distance, a pair of vertical screws, a pair of internally-threaded sleeves engaging said screws and carrying the elevator, a shaft journaled in the frame and geared to said screws, and means for transmitting motion in one direction or the other to the last-named shaft from the shaft of the swing-arm.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE B. MAEGLY.

Witnesses:

HELEN C. RODGERS,
M. A. O'DONNELL.