

A. B. DICK.
 STENCIL DUPLICATING APPARATUS.
 APPLICATION FILED JAN. 4, 1911.

1,024,186

Patented Apr. 23, 1912

3 SHEETS-SHEET 1.

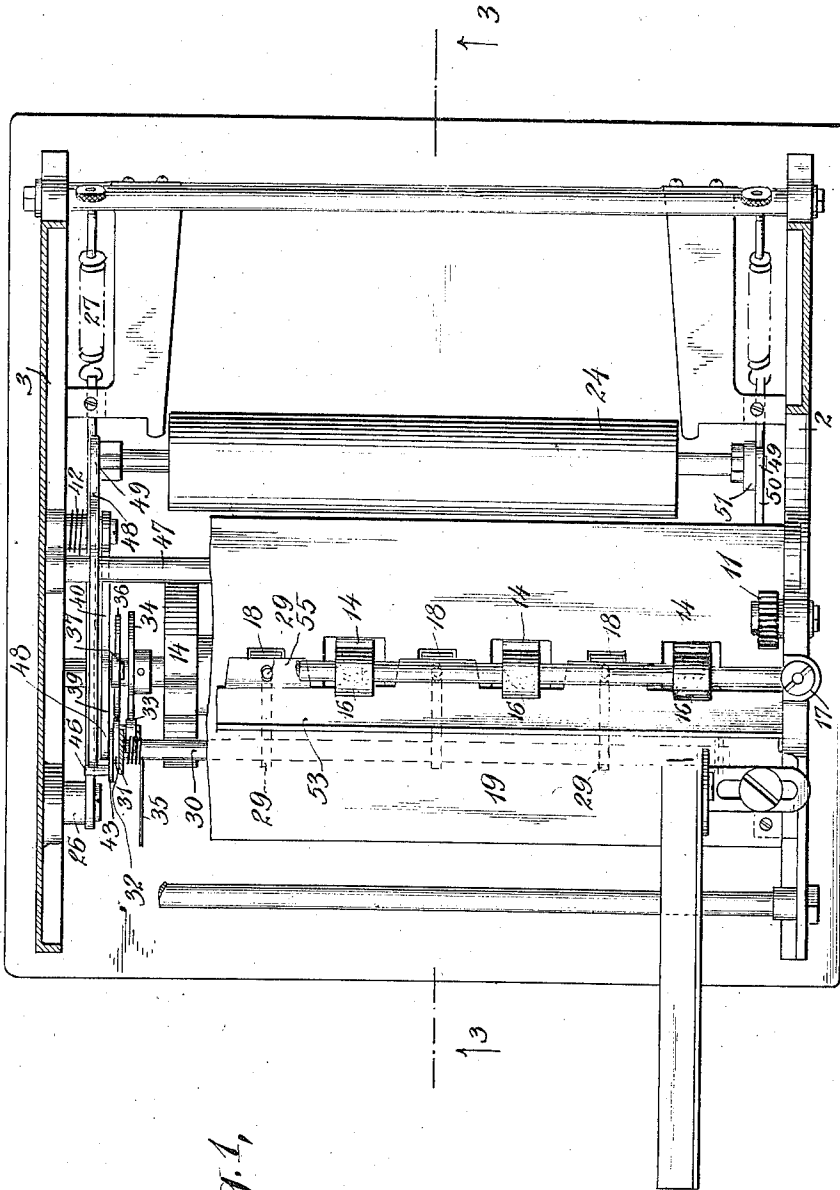


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2,

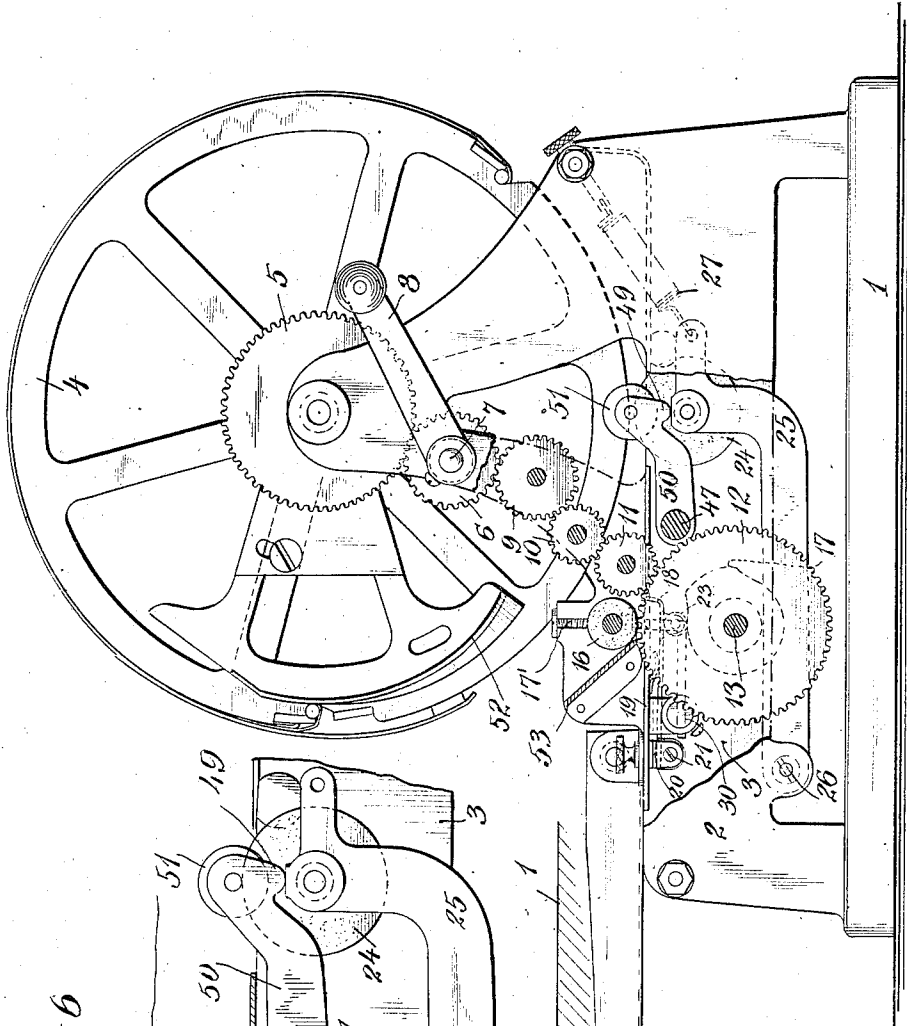
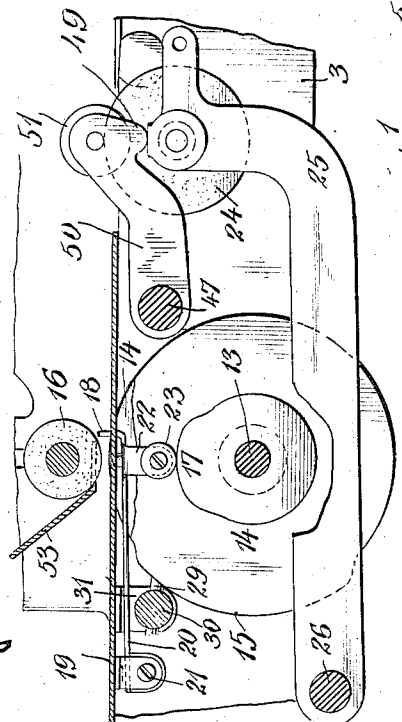


Fig. 6



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3 SHEETS-SHEET 3.

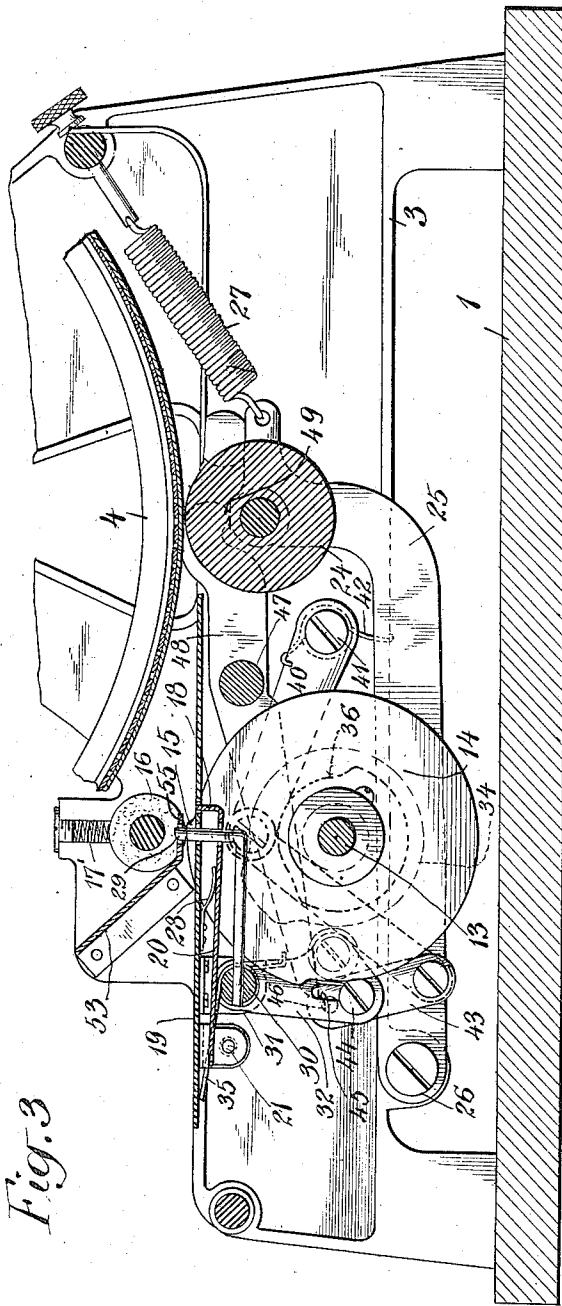


Fig. 3

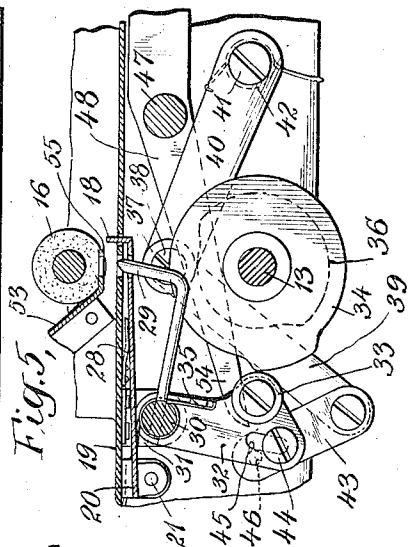


Fig. 5

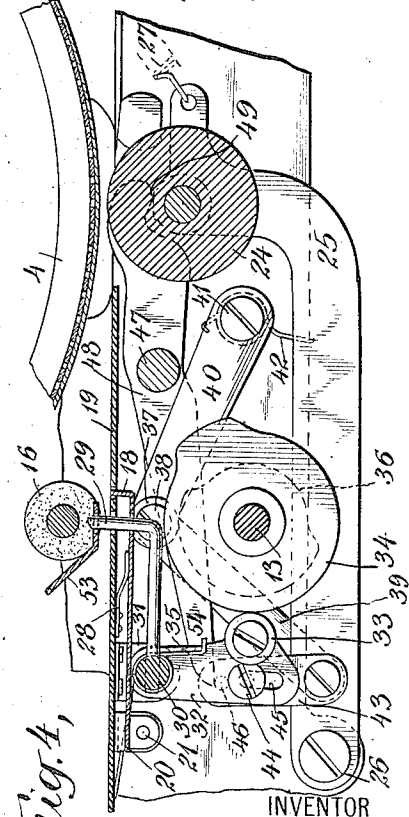


Fig. 4

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STENCIL-DUPLICATING APPARATUS.

1,024,186.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed January 4, 1911. Serial No. 600,686.

To all whom it may concern:

Be it known that I, ALBERT B. DICK, a citizen of the United States, residing at Lake Forest, in the county of Lake, in the State of Illinois, have invented certain new and useful Improvements in Stencil-Duplicating Apparatus, of which the following is a specification.

This invention relates to stencil duplicating apparatus, and its object is to effect certain improvements in the construction of apparatus of this character whereby the work of feeding in the sheets to the stencil carrying drum is greatly facilitated and superior results are obtained, particularly in that better registration may be secured and the printing may be made to extend as close to the edges of the sheet as is desired.

In stencil duplicating machines as now commonly employed, the impression sheets are fed manually to a position in which the forward edge lies between the drum and the underlying pressure roller.

One of the features of the present invention involves the provision of sheet feeding devices which grip the sheet and forward it mechanically between the drum and pressure roller. With such apparatus, suitable adjustment may be made whereby the sheet may be so imprinted upon that the printed matter begins close to the edge of the sheet.

Another feature of improvement lies in the provision of means whereby, in case no sheet is fed to the drum at the proper time, the pressure roller will be held in inoperative position so that it will not coact with the drum, and therefore will not take up ink from the drum, which ink would be deposited on the back of the next sheet to be passed through the machine.

This and other features of the invention, together with the advantages secured by their use, will be fully described in connection with the accompanying drawings, which illustrate the preferred embodiment of the invention.

In the drawings, Figure 1 is a top view of the machine with the drum removed and certain other parts broken away; Fig. 2 is a side view of the machine broken away in part; Fig. 3 is a vertical section of the machine, on line 3-3 of Fig. 1 certain of the parts being shown in elevation; and Figs. 4, 5 and 6 are views of certain of the

operating mechanism showing different positions thereof.

Referring to the drawings, the machine consists of a base, 1, upon which side-frames, 2 and 3, are erected. The stencil carrying drum, 4, is provided with trunnions at its ends, which are received in bearings formed in these side frames. A gear, 5, is secured to the drum, and meshes with a pinion, 6, carried by a stub shaft, 7, mounted for rotation in a bearing formed in the side frame, 2, and an operating handle 8, is secured to the shaft 7. A train of gears, 9, 10, 11 and 12, is driven from the pinion 6, the gear 12 being mounted upon a shaft, 13, which is rotatable in bearings formed in the side frames. Shaft 13 carries a sheet feeding roller, and this roller preferably consists of a plurality of sections, 14. The gearing operated by the handle 8 is such that the sheet feeding roller 14 makes one revolution for each revolution of the stencil carrying drum 4. The sections 14 of the sheet feeding roller have a portion, 15, which is of greater radius than the remainder of the section. Co-acting with the sheet-feeding roller 14 is a second roller, 16, directly overlying the roller 14, and mounted for rotation in bearing boxes which are slidable in ways formed in the side frames, and are pressed downwardly by springs 17. The ways in which these bearing boxes slide are of such depth that the roller 16, which is preferably of sectional form, may co-act with the portion 15 of the sheet feeding roller 14, but not with the portion thereof which is of less diameter. Secured upon the shaft 13 is a cam, 17 adapted to operate stops, 18, which facilitate positioning the impression sheets. The sheets are fed by hand or otherwise over a feed board, 19, mounted upon the side frames of the machine. The stops 18 project upwardly through openings in the feed board, 19, and are formed upon the edge of a plate, 20, which is pivotally mounted at 21 upon the underside of the feed board 19. The plate 20 is provided with a downwardly extending projection, 22, carrying a roller, 23 which rides on the periphery of the cam, 17.

The pressure roller, 24, underlying the stencil carrying drum, is mounted for rotation in arms, 25, which are pivotally mounted at 26 upon the side frames of the machine, and springs, 27, are connected at one end to

an arm, 25, and at the other end to a stud on the side frame, these springs acting to draw the pressure roller upward into co-action with the drum.

5 When the sheet is positioned upon the feed board, with its forward edge in co-
action with the stops 18, and the handle 8 is
turned, the drum and the shaft 13 will be
revolved, until the projection on cam 17
10 passes from under the roller 23, whereupon
the stops 18 will be caused to drop by a
spring, 28, acting thereon, until their ends
are below the surface of the feed board 19;
15 immediately thereafter the portions 15 of
the sheet feeding roller, 14, will grip the
sheet between them and the sheet feeding
roller 16, and these two rollers will forward
the sheet over the surface of the feed board
20 until its forward edge passes between the
stencil carrying drum and the pressure roller
24. The enlarged portion, 15, of the roller,
14, is of such length that immediately after
the edge of the sheet passes between the
25 drum and the pressure roller, the sheet is re-
leased by the sheet feeding rollers 14 and 16,
so that the subsequent movement of the sheet
is effected solely by the drum and pressure
roller, and therefore there is no tendency to
30 move the sheet angularly to an improper
position or to buckle and crease it. Further-
more, it will be noted that by properly ad-
justing the gear, 5, with respect to the drum
4, as is well known in the art, the printing
35 may be made to begin as near the forward
edge of the sheet as may be desired.

Immediately in rear of the openings in
the feed board 19, through which the stops
18 project, are other openings through which
upwardly extending fingers 29 are adapted
40 to project, these fingers being carried by a
shaft, 30, which is mounted for rotation in
brackets, 31, depending from the underside
of the feed board 19. Secured to the rod,
30, is a downwardly extending arm, 32, car-
rying a roller, 33, which rides on the periph-
ery of a cam, 34, secured upon the shaft, 13,
45 adjacent to the side-frame 3. Roller 33 is
held in engagement with the cam by a
spring, 35. Beside the cam 34 is a second
cam, 36, also secured on shaft 13, and adapt-
ed to actuate a roller, 37, mounted upon a
50 stud, 38, projecting laterally from a lever,
40, which is pivotally mounted at 41 upon
the side-frame 3. A spring, 42, bears on
arm 40 in a direction to hold roller 37 down
55 on the periphery of cam 36. The lower end,
39, of lever 40 is pivotally connected to one
end of a link, 43, and near the opposite end
of this link 43 is a stud, 44, which passes
60 through a slot, 45, formed in the lower end
of the arm, 32. On the link 43, above the
stud 44, is a laterally projecting stud, 46. A
rock shaft, 47, extends between the side-
frames of the machine and is journaled in
65 bearings therein. Secured to this rock shaft

near the side-frame 3 is a lever, 48, one end
of which is adapted to co-act at times with
the stud 46. The opposite end, 49, (Fig. 3)
of this lever 48 lies directly over the end of
the adjacent arm, 25, carrying the pressure
70 roller. Near the side-frame 2, an arm 50 is
secured to the rock shaft 47, its free end di-
rectly overlying the end of the adjacent arm
25. This arm, 50, carries at its free end a
roller, 51, which is adapted to co-act with
75 a cam, 52, adjustably secured to one side of the
stencil carrying drum, 4. An inclined guide
53, extends between the side-frames above
the feed board 19, and at its forward edge is
provided with projections 54 extending be-
80 tween the sections of the feed roller 16 and
directly overlying the fingers 29, but having
openings in them through which the ends of
fingers 29 may pass.

The operation of these parts of the ma-
85 chine will now be described: Fig. 5 shows
the position of the parts at the time when
a sheet is to be fed into position, and it will
be seen that the fingers 29 are down so that
the sheet may be moved forwardly until its
90 edge is arrested by the stops 18. If the
handle 8 be now actuated so as to turn the
drum in the direction for printing, shaft 13
will be turned in a clockwise direction, as
seen in Fig. 5, and the high point of the
95 cam 34 will pass from under the roller 33,
thereby allowing spring 35 to rock shaft 30
in its bearings, and thus move the ends of
fingers 29 upwardly into engagement with
the sheet. The upward movement of the
100 fingers 29 will be arrested by the sheet be-
fore the fingers have made the full move-
ment of which they are capable, and arrest-
ing the movement of the fingers 29 thus
also arrests the turning movement of arm
105 32, link 43 and the stud 46 carried by link
43. On continued rotation of shaft 13 with
the drum, the raised portion of cam 36 will
act on roller 37 to lift lever 40 and link
43 against the tension of spring 42, the stud
110 44 moving upward in the slot 45 and the
stud 46 rising. At the same time the cam
52 will engage the roller 51, thereby rock-
ing the shaft 47 and depressing the pressure
roller 24 so that the pressure roller will be
115 out of cooperative relation with drum 4 as
shown in Fig. 1. As the pressure roller is
depressed thus, the end, 54, of the lever 48
is raised, and the stud 46 rises at the same
time, but the stud 46 is not under the end
120 54 of lever 48 for the reason that the turning
movement of arm 32 when fingers 29 were
raised was not sufficient to carry the stud
46 under the end 54 of lever 48; for this
reason, when the end of cam 52 passes be-
125 yond the roller 51 there will be nothing
holding the pressure roller from being
raised to operative position in co-action with
the drum by the springs 27, and therefore
the roller will be so raised, the lever 48 130

rocking freely with rod 47. During these movements of the parts, the sheet has been moved forwardly by the sheet feeding rollers 14 and 16, as above described, so that when the pressure roller is moved upward it grips the sheet between it and the drum, and the sheet is imprinted upon and forwarded through the machine. This is the ordinary operation of the parts. But, if no sheet has been positioned upon the feed board with its edge in contact with the stops 18 at the time when the fingers 29 are raised, those fingers will be raised a greater amount, and as a result the arm 32 will have a greater excursion, this excursion being such that the stud 46 on the link 43 is carried under the end 54 of lever 48. In this case, when the stud is raised by the cam 36, and the end 54 of lever 48 is raised by the depression of the pressure roller by cam 52, the stud 46 will be under the end of lever 48, the parts being then in the position in which they are shown in Fig. 4. Then, when the cam 52 passes beyond roller 51, the pressure roller 24 will not be raised by its springs 27 to operative position since such movement can be accomplished only by rocking the lever 48, and rocking of this lever in a direction to carry its end, 54, downwardly is precluded by the stud 46. The pressure roller will, therefore, be held in its inoperative position in which it is shown in Fig. 4, while the drum 4 is given one revolution, whereupon the operation will be repeated. It will thus be seen that whenever a sheet is positioned properly upon the feed board, the operation of the machine will result in the forwarding of the sheet, the raising of the pressure roller to operative position, as shown in Fig. 3, and the printing and forwarding of the sheet, but if ever the operator fails to place a sheet in proper position, during the operation of the machine thereafter, the pressure roller will be held in its depressed or inoperative position, so that it will not contact with the drum and receive ink therefrom. The stud 46 serves as a lock for holding the pressure-roller down after it has been moved down by cam 52. This stud 46 is moved vertically by cam 36, lever 40 and link 43, and it is moved laterally by fingers 29, arm 32 and cam 36. But its lateral movement will be checked when a sheet is in position and is engaged by fingers 29, and when so checked the stud will not co-act with lever 48 to perform its locking function by preventing movement of that arm.

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

1. The combination of a drum, a stencil secured thereon, a pressure-roller mounted adjacent to the drum and adapted to coact therewith, a sheet-feeding roller mounted

parallel with but displaced from said drum and roller, means for rotating the drum and for rotating the sheet-feeding roller one revolution during each revolution of the drum, and a second sheet-feeding roller coacting with said sheet-feeding roller to feed sheets between them to the drum and pressure-roller, one of said sheet-feeding rollers having a portion of greater radius than the remainder of the roller which portion only is adapted to coact with the other sheet-feeding roller to feed sheets to the drum and said portion being of such length that the sheet is released by the two rollers as soon as it is moved into coaction with the drum, substantially as set forth.

2. The combination of a drum, a stencil secured thereon, a pressure-roller mounted adjacent to the drum and adapted to coact therewith, a pair of sheet-feeding rollers mounted parallel to each other and displaced from the drum and pressure-roller, said sheet-feeding rollers being adapted to feed a sheet between the drum and pressure-roller, means for rotating the drum and for simultaneously rotating one of said feeding-rollers one revolution during each revolution of the drum, and means independent of the drum for causing the feeding-rollers to feed a sheet forward a definite and predetermined amount and then release the sheet, the amount of the feeding movement of the sheet being such that the sheet is released immediately after it is gripped by the drum and pressure-roller, substantially as set forth.

3. The combination of a drum, a stencil secured thereon, a pressure-roller mounted adjacent to the drum and adapted to coact therewith, a sheet-feeding roller mounted parallel and adjacent to said drum and roller, means for simultaneously rotating the drum and sheet-feeding roller at the same speed, a cam on the shaft of said sheet-feeding roller, a second sheet-feeding roller coacting with said roller to feed sheets between them to the drum and pressure-roller, one of said sheet-feeding rollers having a portion of greater radius than the remainder of the roller, which portion only is adapted to coact with the other sheet-feeding roller to feed sheets to the drum and said portion being of such length that the sheet is released by the two rollers as soon as it is moved into coaction with the drum, a stop for positioning a sheet for coaction with the feeding rollers, and means actuated by said cam for positioning said stop, substantially as set forth.

4. The combination of a rotatable drum, a pressure-roller movable toward and away from the drum, a pair of parallel sheet-feeding rollers mounted adjacent to the line of co-action of the drum and pressure-roller, one of said sheet-feeding rollers having a

portion of greater radius than the remainder of the roller which portion only is adapted to coact with the other sheet-feeding roller to feed sheets to the drum and said portion being of such length that the sheet is released by the sheet-feeding rollers as soon as it is moved into coaction with the drum, means for simultaneously rotating the drum and the sheet-feeding rollers, a support for holding a sheet in position to be forwarded by said sheet-feeding rollers, a member adapted to coact with a sheet on said support and means dependent upon the coaction of said member with a sheet for controlling the position of the pressure-roller with respect to the drum, substantially as set forth.

5. The combination of a rotatable drum, a pressure-roller coacting therewith, means for moving the pressure-roller away from the drum to inoperative position once in each revolution of the drum, a pair of parallel sheet-feeding rollers mounted adjacent to the line of coaction of the drum and pressure-roller, means for simultaneously rotating the drum and one of said sheet-feeding rollers at the same speed, a support for holding a sheet in position to be forwarded by said sheet-feeding roller, a member adapted to coact with a sheet on said support and means dependent upon the coaction of said member with a sheet for locking the pressure-roller in inoperative position after it has been moved to that position, substantially as set forth.

6. The combination of a drum, a pressure-roller coacting therewith, means for moving the pressure-roller away from the drum to inoperative position once during each rotation of the drum, a support for a sheet to be fed to the drum, a pressure-roller and means for locking the pressure-roller in inoperative position after it has been moved to that position comprising a locking member movable in two directions as the drum is rotated and means controlled by a sheet on said support for regulating the movement of said locking member in one direction, substantially as set forth.

7. The combination of a drum, a movable pressure-roller coacting therewith, a pair of parallel sheet-feeding rollers mounted adjacent to the line of coaction of the drum and pressure-roller, means for simultaneously rotating the drum and said sheet-feeding rollers, a support for holding a sheet in position to be forwarded by said sheet-feeding rollers, a movable stop for positioning a sheet on said support, a cam on the shaft of one of said feeding rollers for actuating said stop, a member adapted to coact with a sheet on said support, and means dependent upon the coaction of said member with a sheet for controlling the position of the pressure-roller with respect to the drum, substantially as set forth.

8. The combination of a drum, a movable pressure-roller coacting therewith, a pair of parallel sheet-feeding rollers mounted adjacent to the line of coaction of the drum and pressure-roller, means for simultaneously rotating the drum and said sheet-feeding rollers, a cam on the shaft of one of said sheet-feeding rollers, a support for holding a sheet in position for coaction with the feeding rollers, a member positioned by said cam and a sheet on said support, and means controlled by said member for positioning the pressure-roller with respect to the drum, substantially as set forth.

9. The combination of a drum, a movable pressure-roller coacting therewith, a pair of parallel sheet-feeding rollers mounted adjacent to the line of coaction of the drum and pressure-roller, means for simultaneously rotating the drum and said sheet-feeding rollers, a cam on the shaft of one of said sheet-feeding rollers, a support for holding a sheet in position for coaction with the feeding rollers, means for moving the pressure-roller to operative and inoperative positions, and a lock for holding the pressure-roller in inoperative position controlled by said cam and a sheet on said support, substantially as set forth.

10. The combination of a drum, a movable pressure-roller coacting therewith, a sheet-feeding roller, means for operating the drum and said sheet-feeding roller at the same speed, a cam on the shaft of said sheet-feeding roller, a second sheet-feeding roller coacting with said feeding roller, a support for holding a sheet in position for coaction with said feeding rollers, and a member positioned by said cam and a sheet on said support for controlling the position of the pressure-roller with respect to the drum, substantially as set forth.

11. The combination of a drum, a movable pressure-roller coacting therewith, a sheet-feeding roller, means for operating the drum and said sheet-feeding roller at the same speed, a cam on the shaft of said sheet-feeding roller, a second sheet-feeding roller coacting with said feeding roller, a support for holding a sheet in position for coaction with said feeding rollers, a stop for positioning a sheet on said support, means for moving the stop to operative and inoperative positions, and a member positioned by said cam and a sheet on said support for controlling the position of the pressure-roller with respect to the drum, substantially as set forth.

12. The combination of a drum, a movable pressure-roller coacting therewith, a sheet-feeding roller, means for operating the drum and said sheet-feeding roller at the same speed, a cam on the shaft of said sheet-feeding roller, a second sheet-feeding roller coacting with said feeding roller, a support

for holding a sheet in position for coaction with said feeding rollers, means for moving the pressure-roller to operative and inoperative positions with respect to the drum and a lock for holding the pressure-roller in inoperative position controlled by both said cam and a sheet on said support, substantially as set forth.

13. The combination of a drum, a pressure-roller, a feeding roller, means for rotating the drum and feeding roller at the same speed, a support for a sheet to be fed by the feeding roller, means for moving the pressure-roller to operative and inoperative positions, and means for locking the pres-

sure-roller in inoperative position comprising a locking member, cams on the shaft of said feeding roller for moving said locking member in two directions and means controlled by a sheet on said support for regulating the movement of said locking member in one direction, substantially as set forth.

This specification signed and witnessed this 29th day of December, 1910.

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Witnesses:

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