

G. W. SWIFT, JR.
PAPER FEEDING MECHANISM.
APPLICATION FILED NOV. 18, 1910.

1,136,128.

Patented Jan. 26, 1915.

3 SHEETS-SHEET 1.

FIG. I.

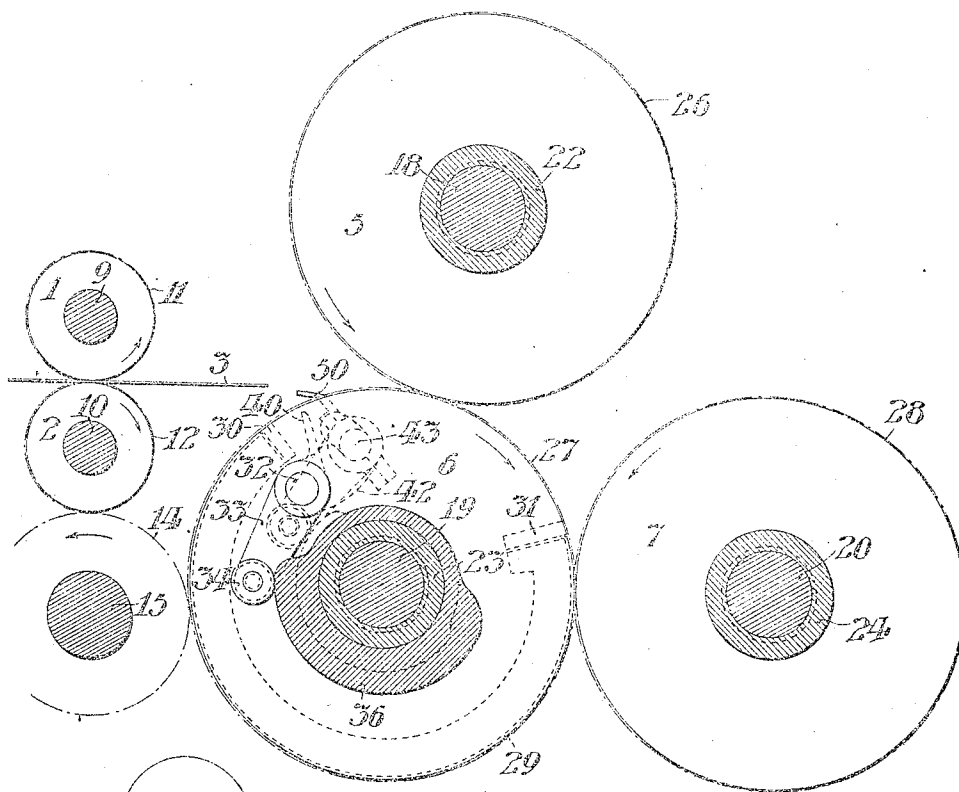
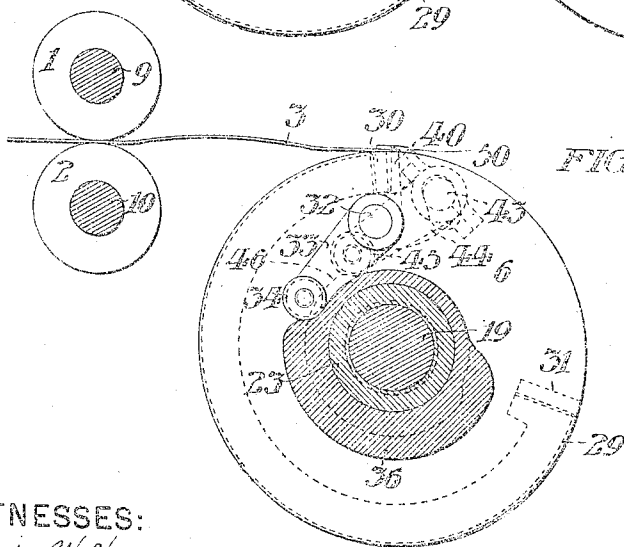


FIG. II.



WITNESSES:

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INVENTOR:

GEORGE W. SWIFT JR.
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FIG. III.

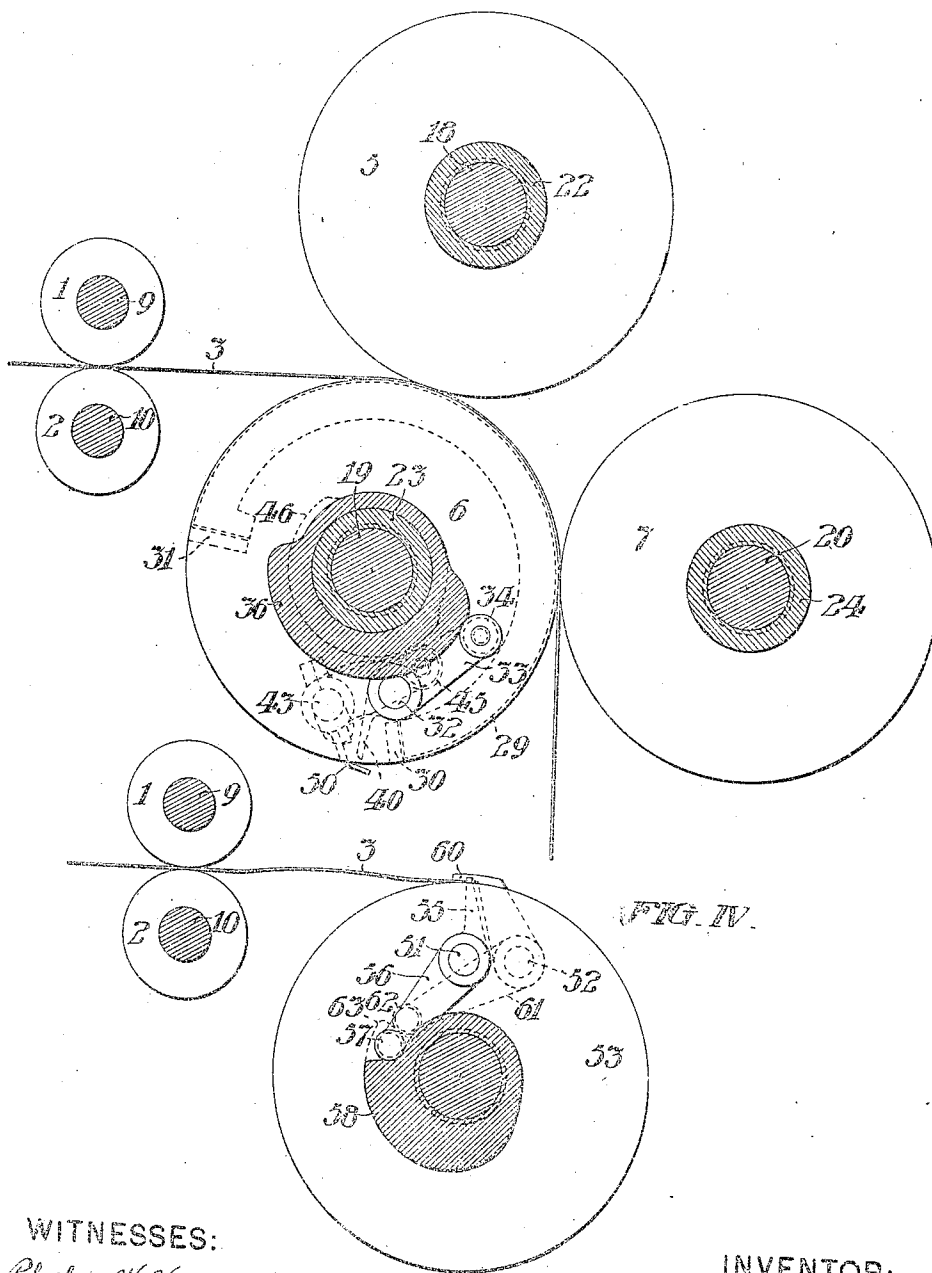


FIG. IV.

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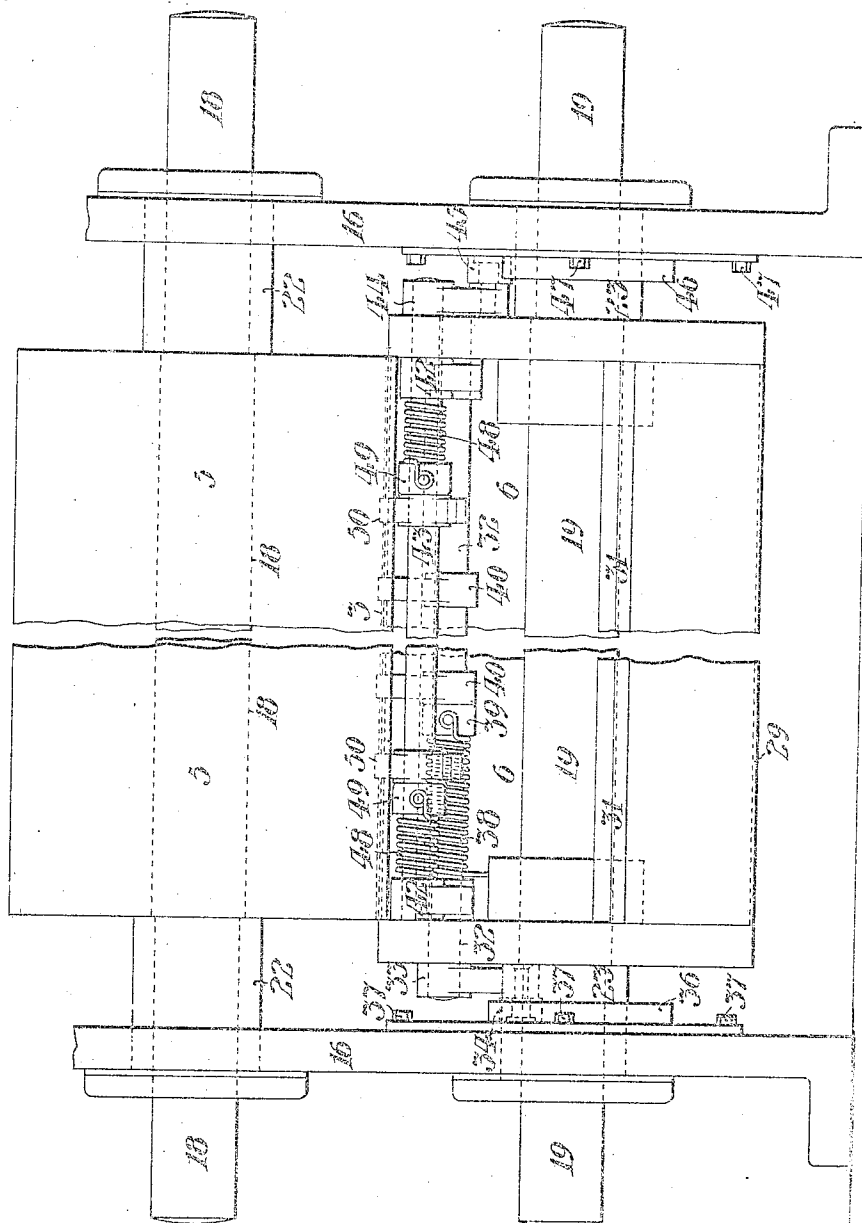
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3 SHEETS-SHEET 3.

FIG. V.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE W. SWIFT, JR., OF BORDENTOWN, NEW JERSEY.

PAPER-FEEDING MECHANISM.

1,126,128.

Specification of Letters Patent.

Patented Jan. 26, 1915.

Application filed November 13, 1910. Serial No. 592,964.

To all whom it may concern:

Be it known that I, GEORGE W. SWIFT, Jr., of Bordentown, in the State of New Jersey, have invented a certain new and useful Improvement in Paper-Feeding Mechanism, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to means for feeding cut sheets of paper or other fabric to a printing machine, so that the forward edge of each sheet shall be presented in proper rectangular relation to the type form.

My improvement is particularly applicable to printing machines wherein one of the members of the printing couple is rotary and carries stops against which the forward edge of each sheet is presented. Ordinarily in machines of said class such stops are carried in rigid relation with the rotary member, and the paper is fed forward faster than the peripheral speed of said rotary member so as to present each sheet of paper against said stops in proper time. Such difference in the rate of progression of the sheets in the machine before and after they encounter said stops of course necessitates a complex differential operation of the feeding and printing mechanism.

It is an object of my invention to avoid the necessity for such differential operation, by providing paper feeding mechanism wherein the paper may be progressed at the same rate both before and after it encounters the stops, and, as hereinafter described my invention includes the provision of stops which are automatically relatively oscillatory with respect to the rotary member which carries them; such member being an impression cylinder which is opposed to the type or printing cylinder in the printing machine. The construction and arrangement set forth is such that said stops are automatically rocked backward with respect to the direction of rotation of said impression cylinder and travel of the paper, so as to encounter the forward edge of each sheet and buckle it backward sufficiently to insure that its forward edge shall be presented in alinement against said stops, which project from the periphery of said cylinder, in alinement parallel with its axis. Moreover, as hereinafter described said automatically operative oscillatory stops are

associated with automatically operative oscillatory grippers, whereby the forward edge of each sheet is gripped and held in the proper position upon the impression cylinder, determined by said stops, while being printed.

As hereinafter described, my invention includes two forms of such mechanism; first, a form wherein the stops and grippers though independently oscillatory are carried by a single frame arranged to oscillate in bearings in the cylinder; said stops being carried on one rock shaft in rigid relation with said frame, and said grippers being carried on another rock shaft, independently oscillatory in said frame, said shafts being rocked by respectively different cams; and, second, a form wherein the shafts carrying said stops and grippers are supported independently of each other, and are independently operated by respective cams.

My invention includes the various novel features of construction and arrangement hereinafter more definitely specified.

In the drawings; Figure I is an end view, partly in section, showing a convenient embodiment of my invention; wherein the stops and grippers being in inoperative position, about to engage a sheet of paper to register and grip the latter, are carried by a single oscillatory frame. Fig. II is a view of the impression cylinder shown in Fig. I, but with said stops and grippers engaging the sheet of paper. Fig. III is a view similar to Fig. I but showing the stops and grippers shifted to release the sheet of paper previously engaged. Fig. IV is an end view, partly in section, showing a modified form of my invention, wherein the shafts carrying the stops and grippers are supported independently of each other. Fig. V is a right hand side view of the impression cylinder in the position shown in Fig. II, in conjunction with other parts of said mechanism.

Referring to the form of my invention shown in Figs. I, II and III; the feed rolls 1 and 2 are arranged to continuously progress sheets of paper 3 at a uniform rate of speed, being the peripheral speed of rotation of the printing couple including the printing cylinder 5 and the impression cylinder 6. The printing cylinder 7 may also be arranged to cooperate with said impres-

sion cylinder 6; for instance, to print a color different from that printed by said cylinder 5.

The shafts 9 and 10 of said feed rolls 1 and 2 are respectively provided with the intermeshed gears 11 and 12; the latter being engaged with the gear 14 on the driving shaft 15, and, said shafts being journaled in the frame 16 shown in Fig. V. Said cylinders 5, 6 and 7 have respective shafts 18, 19 and 20 journaled in the bearings 22, 23 and 24 of said frame 16 and provided with the intermeshed gears 26, 27 and 28; said gear 27 being engaged by said gear 14 on the driving shaft 15, so that said rolls and cylinders are rotated in definite relation to each other and at the same peripheral speed. Said impression cylinder 6 which is conveniently provided with the tympan sheet 29 detachably connected therewith by the removable strips 30 and 31, has the stop shaft 32 journaled therein, having at one end the lever arm 33 carrying the roller 34 in operative relation with the stationary cam 36 which is conveniently supported by said frame 16, to which it is adjustably secured by the bolts 37. Said shaft 32 has the spring 38 connecting its collar 39 and the hub of the cylinder 6 and maintaining it in operative relation with said cam 36. Said shaft 32 carries the stop levers 40 which may be adjustably set in any desired position with respect to the length of said cylinder 6 but are radially alined so that when released by said cam 36, said shaft 32 is turned by said spring 38 to shift said stops 40 from the position shown in Fig. I to the position shown in Fig. II; thus buckling the paper 3 and insuring that its forward edge is in alinement against each of said stops, parallel with the axis of said impression cylinder, before being gripped. Said stop shaft 32 is provided with the bearing arms 42 at opposite ends of said cylinder 6 forming an oscillatory frame carrying the gripper shaft 43 which as shown in Fig. V projects at the right end of said impression cylinder and is provided with the lever arm 44 having the roller 45 for coöperation with the stationary cam 46 which is conveniently supported by said frame 16, to which it is adjustably secured by the bolts 47. Said shaft 43 has the springs 48 connecting its collars 49 and the lever arms 42 and maintaining it in operative relation with said cam 46. Said shaft 43 carries the gripper levers 50 which may be adjustably set in any desired spaced position with respect to the length of said impression cylinder but are radially alined and preferably located so as to clamp the paper 3 to the impression cylinder adjoining said stop levers 40. Said cams 36 and 46 are normally stationary but are independently rotatably adjustable upon said frame 16 so that the relative operation

of said stop levers and gripper levers may be adjustably predetermined. However, I find it convenient to so adjust said cams and levers that the forward edge of each sheet 3 is gripped upon said impression cylinder 6 immediately upon being buckled backward parallel with the axis of said cylinder, as shown in Fig. II.

Although I find it convenient to support the gripper shaft independently of the impression cylinder and in connection with the stop shaft as above described said shafts may be supported independently of each other, for instance, as shown in Fig. IV wherein the stop shaft 51 and gripper shaft 52 are both journaled in the impression cylinder 53 independently of each other. Said stop shaft 51 carries the stop levers 55 and has the lever arm 56 provided with the roller 57 to coöperate with the normally stationary cam 58; said shaft 51 being spring pressed like the shaft 32 above described. Said shaft 52 carries the gripper levers 60 and has the lever arm 61 provided with the roller 62 to coöperate with the normally stationary cam 63; said shaft 52 being spring pressed like the shaft 43. The arrangement of this form of my invention is such that when released by said cam 58 said shaft 51 is turned by its spring to buckle the sheet 3 backward by the stops 55 to bring the front edge of said sheet parallel with the axis of the cylinder 53 before being gripped by the lever 60.

I do not desire to limit myself to the precise details of construction and arrangement herein set forth as it is obvious that various modifications may be made therein without departing from the essential features of my invention as defined in the appended claims.

I claim:—

1. In paper feeding mechanism, the combination with a frame; of a rotary cylinder journaled in said frame; a stop shaft journaled in said cylinder eccentric to the axis thereof, having a plurality of stop levers rigidly secured thereon in spaced relation intermediate of the length of said cylinder, arranged to project radially beyond the periphery of said cylinder in alinement with each other parallel with the axis of said cylinder; a plurality of bearing arms carried by said shaft, in rigid relation therewith, having shaft bearings in alinement with each other parallel with the axis of said cylinder; a gripper shaft journaled in said arms; a plurality of gripper levers rigidly secured on said gripper shaft in spaced relation, intermediate of the length of said cylinder; normally stationary cams respectively at opposite ends of said cylinder; means detachably securing said cams to said frame; lever arms upon said shafts respectively at opposite ends thereof, having rollers respectively adapted to coöperate with said cams

to turn said shafts; springs respectively encircling said shafts and connecting the same with said cylinder, whereby said shafts are maintained in coöperative relation with said cams; a pair of feed rolls; and, means operatively connecting said cylinder and rolls; whereby, said rolls are arranged to progress a sheet toward said impression cylinder at the peripheral speed of the latter, said stops are turned backward with respect to the direction of progression of said sheet and rotation of said cylinder, to encounter the forward edge of said sheet, buckle it backward sufficiently to insure that it shall be presented in alinement against said stops, and, said grippers engage said alined edge of said sheet against said cylinder.

2. In paper feeding mechanism, the combination with a rotary cylinder; of a stop shaft journaled in said cylinder having a plurality of stop levers rigidly secured thereon in spaced relation intermediate of the length of said cylinder, arranged to project radially beyond the periphery of said cylinder in alinement with each other parallel with the axis of said cylinder; a plurality of oscillatory bearing arms having shaft bearings in alinement with each other parallel with the axis of said cylinder; a

gripper shaft journaled in said arms; a plurality of gripper levers rigidly secured on said gripper shaft in spaced relation, intermediate of the length of said cylinder; normally stationary cams; lever arms upon said shafts respectively having rollers respectively adapted to coöperate with said cams to turn said shafts; springs whereby said shafts are maintained in coöperative relation with said cams; a pair of feed rolls; and, means operatively connecting said cylinder and rolls; whereby, said rolls are arranged to progress a sheet toward said impression cylinder, said stops are turned backward with respect to the direction of progression of said sheet and rotation of said cylinder, to encounter the forward edge of said sheet, buckle it backward sufficiently to insure that it shall be presented in alinement against said stops, and, said grippers engage said alined edge of said sheet.

In testimony whereof, I have hereunto signed my name at Bordentown, New Jersey, this fifteenth day of November, 1910.

GEORGE W. SWIFT, Jr.

Witnesses:

JOHN E. HORN,
HAROLD B. WELLS.