Feb. 21, 1956 A. W. KETTER ET AL 2,735,361

APPARATUS FOR PRINTING ROLL CONTROL

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Fig. 1.

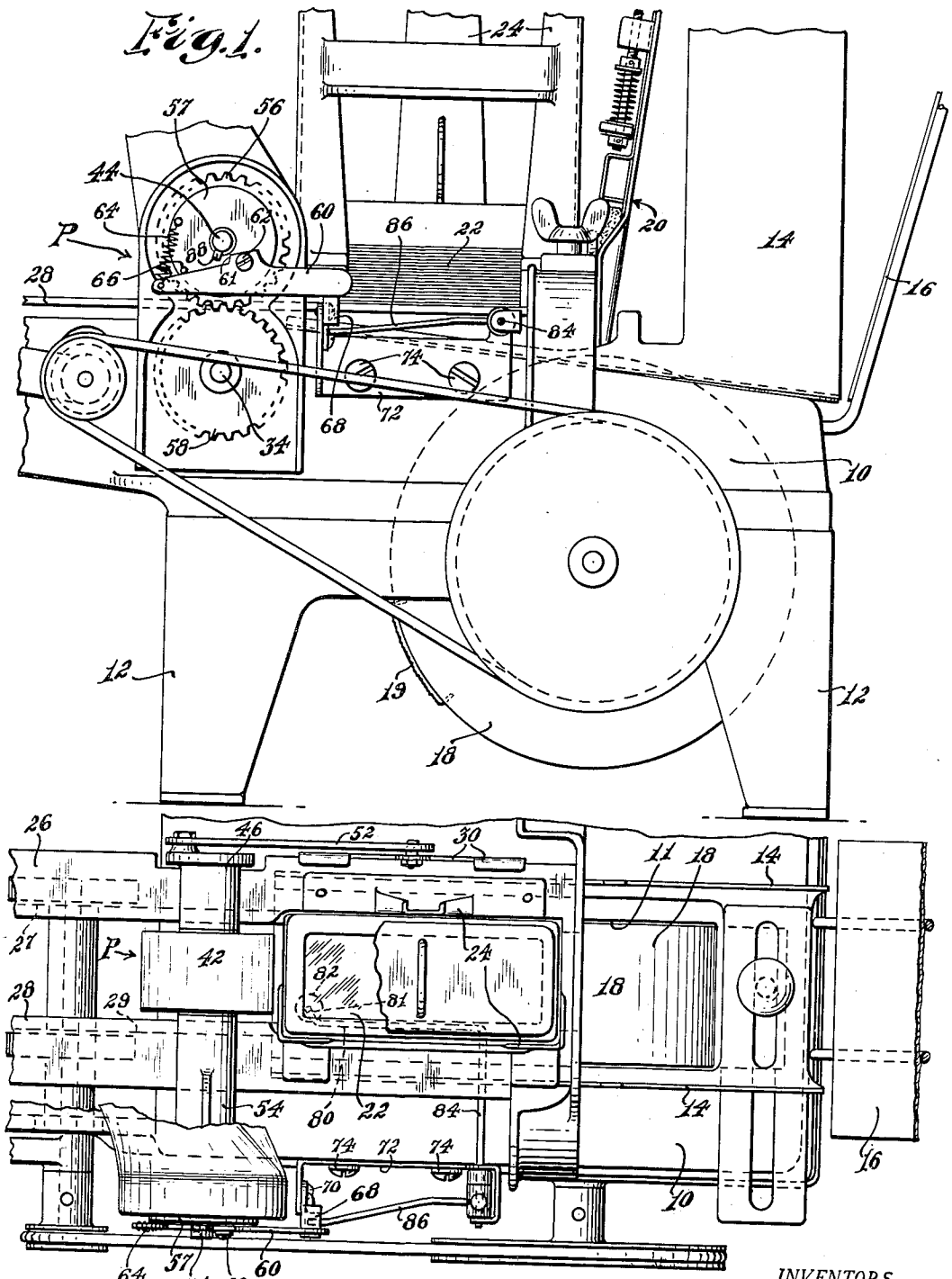






Fig. 2.

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Fig. 3.

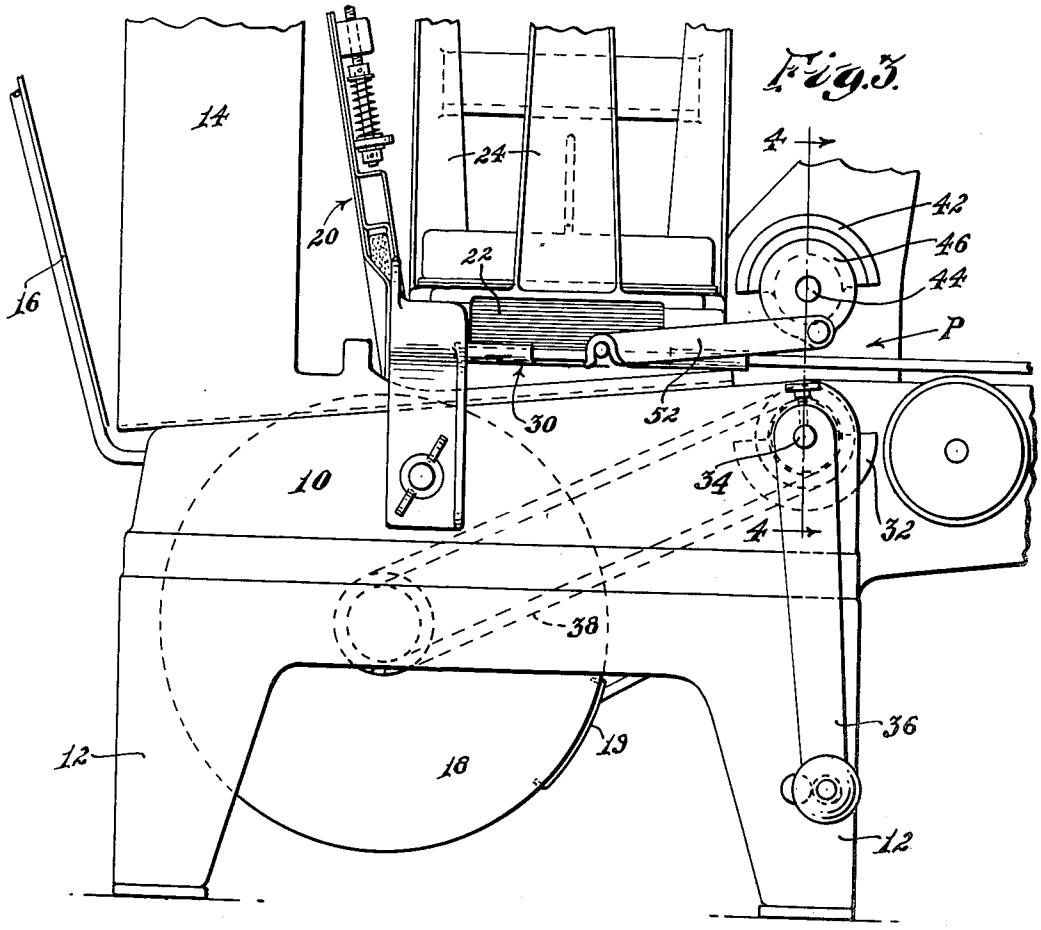
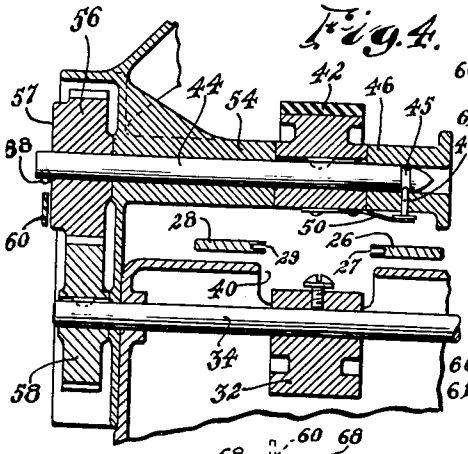



Fig. 4.



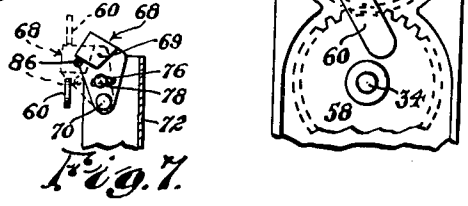




Fig. 7.

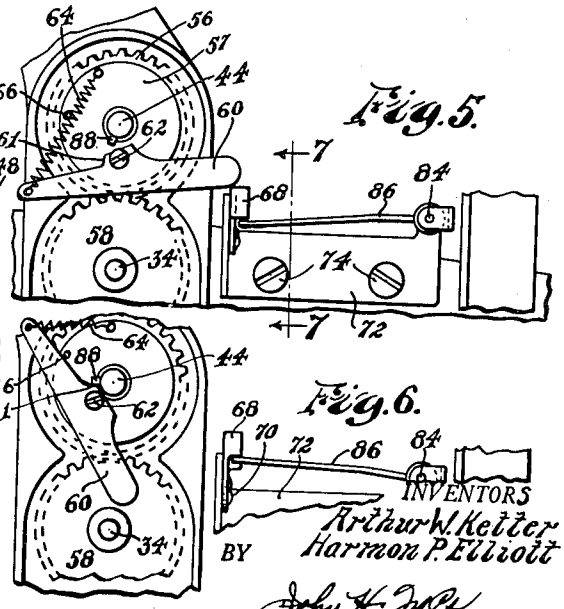



Fig. 5.







Fig. 6.




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Fig. 8.

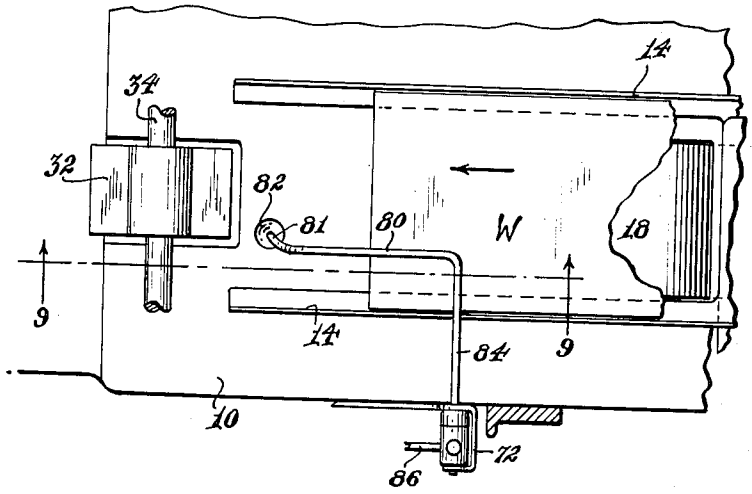



Fig. 9.

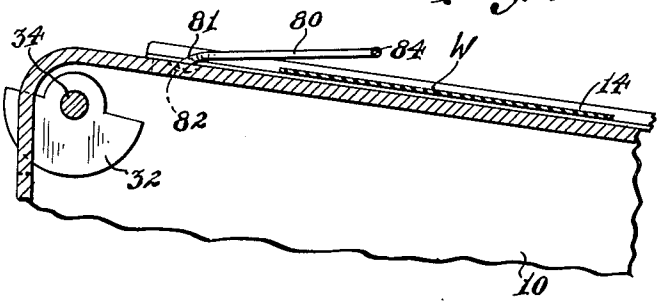
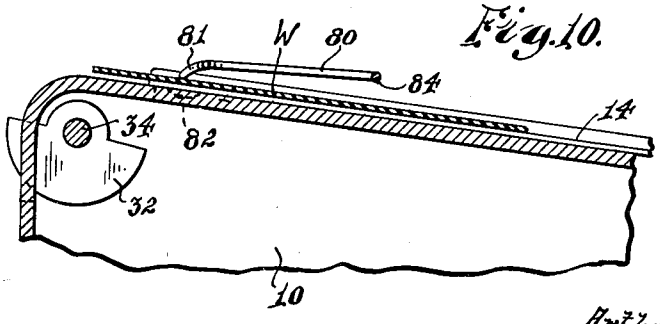



Fig. 10.




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2,735,361

# APPARATUS FOR PRINTING ROLL CONTROL

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Application November 30, 1954, Serial No. 472,199

5 Claims. (Cl. 101—53)

This invention relates to improvements in apparatus for printing roll control and more particularly to such apparatus which responds automatically to disable the printing roll of a printing machine if and when work feeding means fails for any reason to feed an element of work to printing position. The invention is herein disclosed as it may be embodied in a printing machine of the type wherein printing is effected through the medium of printing devices, such as stencils, which advance in succession to the printing position, in timed relation to the advance of work elements in succession to the printing position, for coaction there with an anvil and a printing roll. In case the work feeding means fails to feed a work element at the beginning of any printing cycle, it is desirable that the printing roll be disabled until a work element is advanced. Also, it is desirable to stop the feed of printing devices when no work element is in a predetermined position.

The apparatus of the invention simultaneously disables the printing roll and the means for advancing printing devices whenever, for any reason, a work element has not been fed to a predetermined position.

It is among the objects of the invention to provide a relatively simple and effective means for automatically disabling the printing roll of a printing machine if and when a work element is not in a predetermined preliminary position ready to be printed upon and, when desired, for simultaneously automatically disabling means for advancing printing devices to the printing position.

Another object of the invention is to provide a printing roll control apparatus wherein an anvil constantly is in condition to be rotated, and a printing roll is fixed on a shaft which is releasably connected to a sleeve which latter rotates whenever the anvil is rotated, there being means operative for releasing the connection between said shaft and sleeve whenever no work element is in a predetermined preliminary position ready to be printed upon.

A further object of the invention is to provide a printing roll control apparatus wherein the printing roll is releasably connected for rotation with a sleeve element when said sleeve element is rotated while a work element is in a predetermined preliminary position, the printing roll becoming automatically released from said sleeve in response to any failure of the work feed and when a work element, for any reason, is not in a predetermined position ready to be printed upon.

It is, moreover, our purpose and object generally to improve printing machines, and more especially to provide an improved automatic control for the printing roll of such machines and for the stencil feed in printing machines which print from stencils or comparable printing devices.

In the accompanying drawings:

Fig. 1 is a rear elevational view of a printing machine equipped with printing roll control apparatus embodying features of the invention, parts at one end of the machine being omitted;



Fig. 2 is a top plan view of the rear portions of the machine of Fig. 1;

Fig. 3 is a front elevational view of the machine of Figs. 1 and 2;

Fig. 4 is a fragmentary cross-sectional view on line 4—4 of Fig. 3;

Fig. 5 is a fragmentary rear elevation of the printing roll control apparatus showing the printing roll shaft disconnected from the drive shaft;

Fig. 6 is a view generally similar to Fig. 5 but showing the printing roll shaft connected for rotation in response to rotation of the drive shaft;

Fig. 7 is a cross-sectional view of the pivoted abutment, on line 7—7 of Fig. 5.

Fig. 8 is a plan view showing a work element in one position on the work guides, upper portions and elements of the machine being omitted;

Fig. 9 is a fragmentary cross-sectional view on line 9—9 of Fig. 8; and

Fig. 10 is a view similar to Fig. 9 but with the work element advanced along the guides to a position in which it conditions the machine for printing.

Referring to the drawings, the particular printing machine illustrated has a generally hollow base **10** with legs **12** for resting on a table or other support. A supply of work sheets, envelopes, post cards, or the like, may be held within the adjustable guide elements **14, 16** at one end of the machine with the lowermost work element in position to be engaged by the feed drum **18**, there being an opening at **11** in the top wall of base **10** (Fig. 2) through which a peripheral portion of the drum extends for engaging the lowermost work element. A conventional or suitable feed means is indicated generally at **20** for coaction with drum **18** in permitting feed of only a single work element in response to a rotation of drum **18**. However, the drum is effective for feeding a work element only when the peripheral strip or strips **19** on the drum engages or engage the lowermost work element.

Printing is effected at a printing position indicated generally at P by means of printing devices in the nature of stencils which may be held in a stack, as at **22**, within a stencil holder **24**. The stack of stencils is supported on a pair of spaced and parallel tracks **26, 28** whose inner edges are grooved at **27** and **29**, respectively, excepting that the upper wall of each track groove is removed at the location of the supply stack of stencils so that the lowermost stencil in the stack **22** rests on the lower walls of the track grooves in position to be pushed along the tracks with opposite side margins of the advancing stencil becoming engaged within the track grooves **27, 29**. A conventional pusher means **30** is slidable on track **26** and has a projection (not shown) for engaging back of the lowermost stencil in the stack.

At the printing position P, a segmentary anvil roll **32**, of metal, or the like, is fixed on a shaft **34** which extends transversely through base **10** with its forward end protruding and equipped with a handle **36** (Fig. 3). This shaft **34** has drive connection with the shaft of drum **18**, as by chain **38** engaged around sprockets on the respective shafts. Anvil roll **32** is located below the plane of tracks **26, 28** and is rotatable within an opening **40** in the top wall of base **10**.

A segmentary printing roll **42** is mounted above the plane of tracks **26, 28** for coaction with the anvil roll **32**. Roll **42** preferably is slidably keyed on a shaft **44** for rotation with the shaft, but the roll is readily removable from the shaft when desired. As shown (Fig. 4), the forward end portion of shaft **44** is annularly grooved at **45**, and a flanged sleeve **46** is mounted on this grooved end of the shaft. A spring-pressed pin **48** engages in groove **45** to releasably lock the sleeve on the shaft. One end of a strip-form spring **50** resiliently engages the pin

48 and the other end portion of the spring is fixed to printing roll 42 whereby the sleeve 46 rotates with roll 42 and shaft 44. Sleeve 46 is connected by link 52 (Fig. 3) to the stencil pusher means 30, whereby rotation of sleeve 46 actuates the pusher means.

The shaft 44 is journaled in a fixed bearing 54 with its rearwardly extending end portion protruding beyond bearing 54. A sleeve shown in the form of a spur gear 56 is rotatably mounted on the protruding end of shaft 44 and constantly meshes with a spur gear 58 which is fixed on the rear end of shaft 34. Hence, whenever shaft 34 is rotated by means of handle 36, the sleeve or gear on shaft 44 will be rotated.

According to the invention, rotation of shaft 34 causes sleeve or gear 56 to rotate idly on shaft 44 excepting when a work element is in position for coaction with a stencil, or comparable printing device, at the printing position P. But, whenever a work element is in the said coacting position, the sleeve or gear 56 is conditioned to become latched to shaft 44 for rotation of shaft 44 and of the printing roll 42 and sleeve 46 thereon.

As best seen in Figs. 5–7, the gear 56 has an annular relatively large diameter hub 57 thereon, and a latch lever 60 is pivotally mounted at 62 on the face of hub 57. A spring 64 is connected to one end of the lever and constantly biases lever 60 in clockwise direction about its pivot 62, as viewed in Figs. 5 and 6, and normally maintains the lever against a suitable stop, such as pin 66 on the face of hub 57. The other end portion of lever 60 projects appreciably beyond the hub 57 and, when gear 56 rotates clockwise (Figs. 5 and 6), is adapted to engage a movable abutment 68. Further rotation of gear 56, following engagement of lever 60 with abutment 68, causes the lever to be rocked about its pivot 62, as in Fig. 5, until the lever slides off and past the abutment 68.

The abutment 68, as best seen in Fig. 7, is pivoted at 70 on a bracket 72 which may be suitably secured to base 10 as by the screws 74. A portion 69 of the abutment, relatively remote from pivot 70, has substantially greater thickness than the remainder of the abutment and constitutes a weighted end portion which constantly tends by gravity to rotate the abutment counter-clockwise about its pivot 70, as viewed in Fig. 7. The abutment has an arcuate slot 76 therein, and a pin or screw 78 extends through the slot and is fixed on an adjacent portion of bracket 72. Hence, the pin or screw 78 coacts with the ends of the slot 76 to limit the rotational movements of the abutment which, under the influence of gravity, normally assumes its position as shown dotted in Fig. 7 and as shown in Figs. 1 and 2, wherein it is in the path of movement of latch lever 60. But when the abutment is moved clockwise in Fig. 7 from its dotted to its full line position, it clears the path of lever 60 which then may be carried around on gear 56 without engaging the abutment.

Movement of the abutment 68 to its full line position of Fig. 7 may be effected in response to feed of a work element to a position in which its leading end portion will be within the initial bite of the anvil roll 32 and printing roll 42. In the disclosed embodiment of the invention, this result is accomplished by a rocker means which is shown in the form of a bent relatively rigid wire or rod which has a relatively long arm 80 extending generally in the direction of feed of the work elements, and spaced slightly above the support along which the work elements are fed. As best seen in Figs. 8–10, the forward end portion of arm 80 preferably is bent slightly inwardly and downwardly, as at 81, into a cavity 82, so that, when no work element is under the end portion 81, as in Figs. 8 and 9, the extreme forward end of the arm is below the plane of the work element guides 14. Hence, the leading end of the advancing work element W of Figs. 8–10 engages the portion 81 of arm 80 and cams this end of arm 80 upwardly, as in Fig. 10, to allow the work element to advance. The opposite end of arm 80 is integral with an arm 84 of the wire or rod which latter said arm extends transversely outward and has its outer end journalled in the bracket 72. When the arm 80 is cammed upwardly as in Fig. 10, the integral arm 84 is rotated clockwise about its longitudinal axis. An actuator 86 has one end fixed to the journalled end portion of arm 84 and has its other end portion extending under the head 69 of abutment 68 in position to lift the abutment and swing it about its pivot 70, to its full line position of Fig. 7, whenever a work element is under the inturned end portion 81 of arm 80 holding it in its position of Fig. 10.

The latch lever 60 has a shoulder 61 which is adapted to coact with a pin or projection 88 on printing roll shaft 44 when the path of lever 60 is clear of the abutment 68, in which case the shaft 44 becomes latched for rotation with gear 56, as shown in Fig. 6. Hence, in Fig. 6, it may be assumed that a work element has been fed to position to be printed upon from a stencil, or comparable printing device, as the printing roll 42 is rotated into printing coaction with anvil roll 32. The work element in this position holds the end 81 of arm 80 elevated as in Fig. 10. Also, as shaft 44 and printing roll 42 are rotated, the stencil pusher means 30 will be actuated through connecting link 52. On the other hand, if a work element has not been fed to a position in which it lifts and holds arm 80 elevated, the end 81 of arm 80 will be in the cavity 82, as in Fig. 9, and the abutment 68 will have dropped by gravity to its dotted position of Fig. 7 wherein it causes latch lever 60 to be rocked, as in Fig. 5, enough to cause its shoulder 61 to pass the pin or projection on shaft 44 without engaging it and shaft 44 remains stationary while gear 56 rotates idly thereon. Spring 64 constantly biases lever 60 toward engagement with stop 66.

It will be obvious from the foregoing description, in connection with the drawings, that we have provided a printing apparatus wherein both the printing roll and the stencil pusher means are disabled automatically whenever a work element, for any reason, has not been fed into position to be printed upon in the ensuing printing cycle of the apparatus, and wherein both the printing roll and the stencil pusher means becomes re-activated immediately upon arrival of a work element in said position.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

We claim as our invention:

1. In a printing machine a platen roll and a printing roll fixed respectively on driving and driven shafts and associated for printing coaction when the two rolls rotate simultaneously, a sleeve rotatably mounted on said driven shaft, drive connection between said driving shaft and said sleeve whereby said sleeve is rotated when said driving shaft rotates, a latch-lever pivotally mounted on said sleeve with the axis of its pivot outward from and parallel to the axis of said sleeve, resilient means yieldingly maintaining said lever in latched engagement with said driven shaft whereby said driven shaft and the printing roll thereon rotate with said sleeve so long as the lever is in said latched engagement with the driven shaft, said lever having a portion projecting substantially outward from said sleeve, an abutment pivotally mounted at a fixed location and gravity-actuated to a position in the path of said projecting portion of said lever as the lever is carried on said rotating sleeve around the axis of the sleeve whereby said lever is rocked about its pivot in opposition to said resilient means each time said projecting portion of the lever engages said abutment, thereby to move said lever to an unlatched position with respect to said driven shaft, and means responsive to a work element at a predetermined location for moving and holding said abutment out of the path of said lever whenever a work element is at said predetermined location.

2. In a printing machine, a platen roll and a printing roll fixed respectively on driving and driven shafts and associated for printing coaction at a printing position when

the two rolls rotate simultaneously in opposite directions, means for holding a stack of printing devices, tracks extending from said holding means to and through said printing position, pusher means actuatable along said tracks for advancing printing devices from said stock in succession along said tracks to said printing position, connecting means between said pusher means and said driven shaft whereby said pusher means is actuated to advance a printing device to said printing position in responce to a rotation of said driven shaft, a sleeve mounted rotatably on said driven shaft, a drive connection between said driving shaft and said sleeve whereby the sleeve is rotated when said driving shaft rotates, a latch-lever pivotally mounted on said sleeve with the axis of its pivot outward from and parallel to the axis of said sleeve, said driven shaft having a portion projecting out of said sleeve, a spring constantly biasing said lever about its pivot into latched engagement with said projecting portion of said driven shaft whereby said driven shaft and the printing roll thereon rotate with said sleeve when said lever is in said latched engagement with the driven shaft, pivoted abutment means in position to effect a rocking of said latch-lever out of said latched engagement with the driven shaft each time the said lever is carried around when said sleeve is rotated, and means for swinging said abutment out of the path of said lever in response to feed of a work element to said printing position, whereby said pusher means is actuated and a printing effected at said printing position only if and when a work element is in said printing position.

3. In a printing machine, driving and driven shafts, a platen roll fixed on the driving shaft, a printing roll fixed on the driven shaft, a sleeve rotatably mounted on said driven shaft with an end portion of the driven shaft projecting out of said sleeve, gear connection between said driving shaft and said sleeve whereby the sleeve is rotated when said driving shaft rotates, a latch-lever pivoted on an end portion of said sleeve radially outward from said projecting end portion of the driven shaft, a lug projecting radially from said projecting end portion of the driven shaft, means providing a shoulder on said lever for engaging said lug, a spring biasing said lever about its pivot in direction to cause said shoulder to engage said lug as the lever is carried around said projecting portion of the driven shaft with rotation of said sleeve whereby the driven shaft is rotated with said sleeve, said lever having a portion projecting radially outward beyond said sleeve, a pivoted abutment disposed in the path of said projecting portion of the lever whereby said lever is rocked about its pivot to move said shoulder outward for passing idly by said lug each time the lever is carried around with rotation of said sleeve, and means for swinging said abutment out of the path of said lever in response to feed of work into position to be engaged by said platen and printing rolls.

4. In a printing machine having a printing roll shaft



and a printing roll fixed thereon, means for controlling the operation of said printing roll in response to feed of work elements thereto, comprising a sleeve rotatably mounted on said shaft with an end portion of the shaft projecting outward beyond the sleeve, a lug projecting radially from said projecting portion of said shaft, a latch lever pivotally mounted on an end of said sleeve with its pivot radially outward of and parallel with said projecting portion of said shaft, said lever having a shoulder thereon, spring means constantly biasing the lever about its pivot in direction to move said shoulder into position to engage said lug, a pivoted abutment adapted to stand in the circulatory path of said lever whereby the lever is rocked about its said pivot in opposition to the bias of said spring means each time the lever is carried around the axis of said sleeve with rotation of the sleeve, and means in position to be actuated by a work element feeding to said printing roll for swinging said abutment out of said circulatory path of said lever whereby said shoulder of the lever engages said lug when said sleeve rotates only when a work element is in position causing said abutment to be maintained out of said circulatory path of said lever.

5. In a printing machine having a printing roll shaft and a printing roll fixed thereon, means for controlling the operation of said printing roll in response to feed of work elements thereto, comprising a sleeve rotatably mounted on said shaft with an end portion of the shaft projecting outward beyond the sleeve, a lug projecting radially from said projecting portion of said shaft, a latch lever pivotally mounted on an end of said sleeve with its pivot radially outward of and parallel with said projecting portion of said shaft, said lever having a shoulder thereon, spring means constantly biasing the lever about its pivot in direction to move said shoulder into position to engage said lug, a pivoted abutment adapted to stand in the circulatory path of said lever whereby the lever is rocked about its said pivot in opposition to the bias of said spring means each time the lever is carried around the axis of said sleeve with rotation of the sleeve, and a work actuated lever rotatably mounted at a fixed location on the machine and having one arm extending into the path of work elements feeding to said printing roll whereby said lever is actuated in response to feed of a work element to said roll, said work actuated lever having a second arm for swinging said abutment out of the circulatory path of said latch lever in response to a said actuation of said work actuated lever.

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