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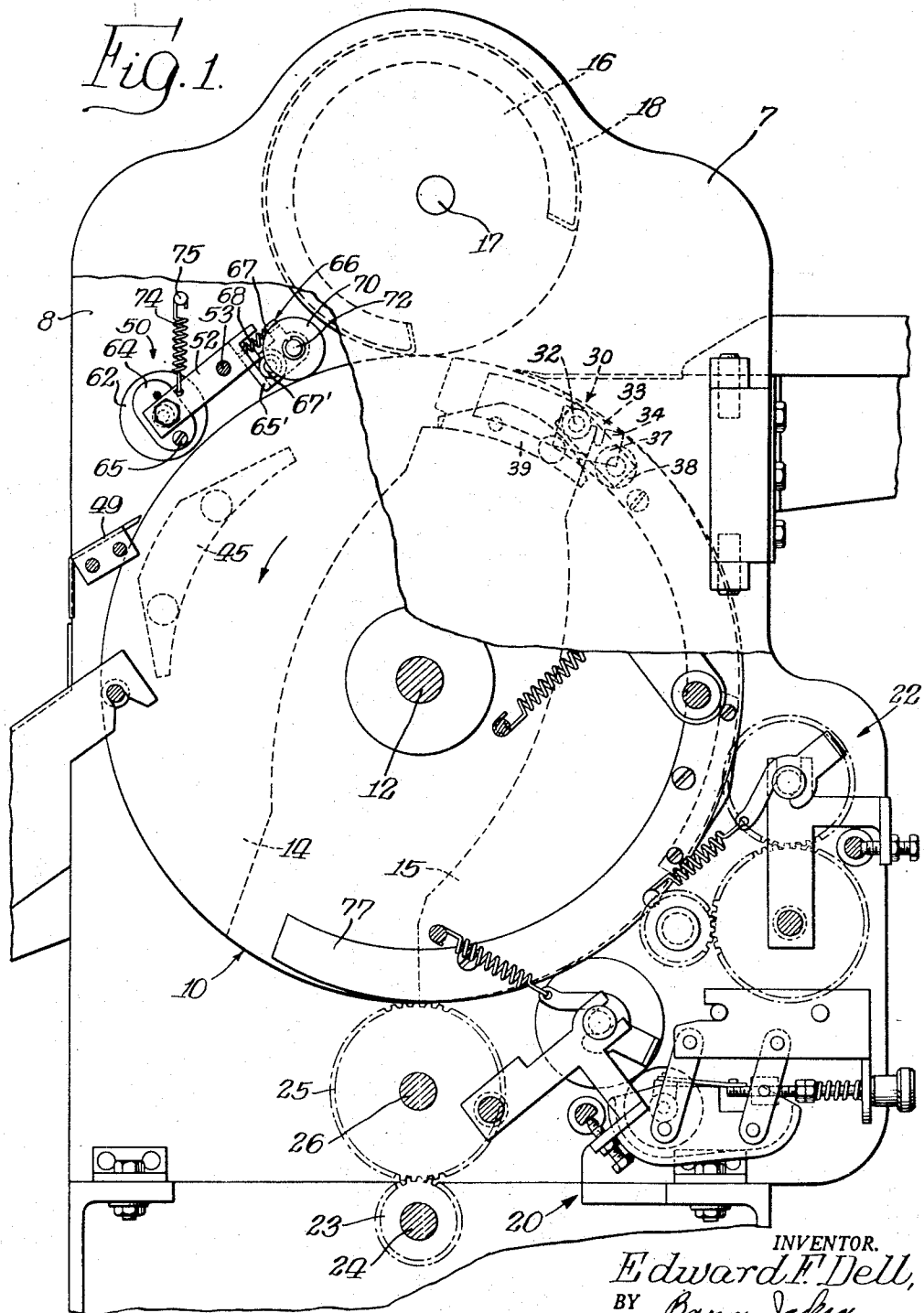
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2,647,462

SHEET STRIPPING MEANS FOR PRINTING PRESSES

Filed April 24, 1950

2 Sheets-Sheet 1



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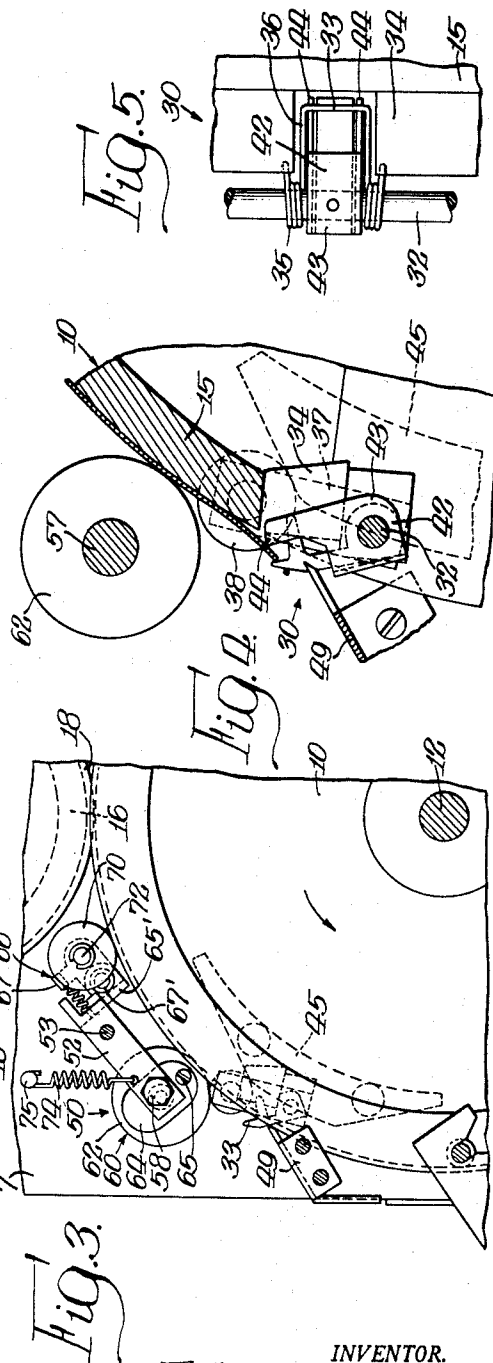
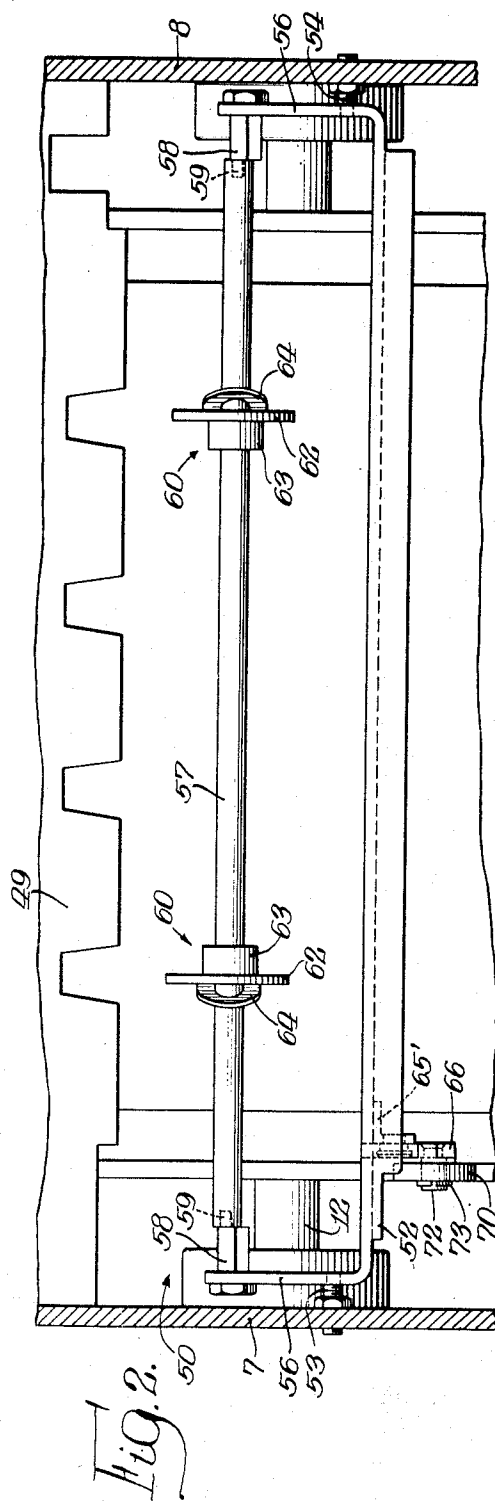
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2 Sheets-Sheet 2



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SHEET STRIPPING MEANS FOR PRINTING PRESSES

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Original application April 29, 1949, Serial No. 90,509. Divided and this application April 24, 1950, Serial No. 157,686

2 Claims. (Cl. 101—232)

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My present invention relates to improvements in printing presses and more particularly to off-set printing presses embodying new and improved sheet ejector means.

The present application is a division of my application Serial No. 90,509, filed April 29, 1949.

In the stripping of a printed sheet from the platen of a printing cylinder, it is known to provide pressure roll means for frictionally engaging the sheet with the platen so as to aid in the stripping of the printed sheet from the cylinder.

It is an object of my invention to provide improved ejector means, of the character indicated, embodying means whereby when a plurality of pressure rolls are employed to provide for the accurate disposal of such rolls relative to the platen segment so that each of the pressure rolls substantially and uniformly engages the sheet with the platen.

A further object is to provide pressure roll means, of the character indicated, having a follower for engaging suitable form roll cam means associated with the press to engage the pressure roll means with the sheet on the printing cylinder, at the appropriate time in the cycle of operation of the press, in which suitable resilient means is provided for mounting of the follower so that the press may be used in printing of sheets of varying thicknesses without adjustment of the pressure roll means or the follower or other parts.

The above and other objects of my invention will appear from the following detailed description of a preferred embodiment of my invention.

Now, in order to acquaint those skilled in the art with the manner of constructing and utilizing printing presses constructed in accordance with the principles of my present invention, I shall describe in connection with the accompanying drawings, a preferred embodiment of my invention.

In the drawings:

Figure 1 is a side elevational view of a printing press embodying my present invention, and in which the near side wall of the press is broken away to illustrate more clearly, in side elevation, the sheet ejector means of my invention.

Figure 2 is a plan view of the sheet ejector means of my invention which, as previously noted, is shown in side elevation in Figure 1;

Figure 3 is a detail side elevational view showing the sheet ejector means and with the printing cylinder in position at which a sheet is being stripped therefrom;

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Figure 4 is a partial sectional view illustrating in side elevation a sheet gripper means having means for raising the leading edge portion of a printed sheet in the stripping of the sheet from the printing cylinder; and

Figure 5 is a plan view of a portion of the sheet gripper means of Figure 4.

Referring now more particularly to Figure 1 of the drawings, I have shown a printing press having an upper main frame comprising a pair of spaced side walls 7 and 8 supported on a suitable base structure 9 of which only a portion is illustrated in these drawings.

The press shown in the drawings is of a construction more fully disclosed in the copending application of William Ward Davidson, Serial No. 68,458, filed December 31, 1948, now U. S. Patent No. 2,561,015. The press includes a plate and platen cylinder 10 of known construction. The cylinder 10 is mounted between the side walls 7 and 8 on a shaft 12 which extends between and is supported at its opposite ends for rotation in suitable bearings carried by the side walls.

The plate and platen cylinder 10, as is known, comprises a plate segment 14 and a platen segment 15, each of a circumferential extent of slightly less than half of the circumferential extent of the whole cylinder with the plate segment 14, as is known, providing for the support thereon of a lithographic plate, or the like.

A blanket cylinder 16 is disposed substantially immediately above the plate and platen cylinder 10 and it is carried by a shaft 17 which extends between the side walls 7 and 8, and is suitably journaled at its opposite ends therein. The blanket cylinder 16 carries a transfer blanket 18 of rubber or the like.

The plate and platen cylinder 10 and the blanket cylinder 16 per se are well known in the art, and it is believed that a further detailed description of these cylinders is not essential for an understanding of my present invention. The constructions of these two cylinders may vary widely and the only essential requirement is that such cylinders be of a character to provide a printing couple for printing a sheet. The plate and platen cylinder 10 is of twice the diameter of the blanket cylinder 16 so that for each complete revolution of the plate and platen cylinder 10 the blanket cylinder is rotated twice.

The platen segment of cylinder 10 and the blanket 18 of the blanket cylinder 16 form a printing couple in a known manner. In the rotation of the plate and platen cylinder 10 in a counterclockwise direction, as indicated by the

arrow in Figure 1, the plate carried by the plate segment is adapted to be dampened by suitable dampening means, shown generally at 20, and then inked by a suitable inking means, indicated generally at 22. The dampening and inking means referred to form no part per se of my present invention, but for a further detail description of them reference may be had to my aforesaid application, of which this application is a division. Upon rotation of the printing plate with the blanket 18 of the blanket cylinder, the ink image of the plate is transferred to the blanket 18 carried by the blanket cylinder 16. Upon feeding of a sheet between the printing couple formed by the blanket 18 of the blanket cylinder and the impression or platen surface of the platen segment 15, the ink image on the blanket is transferred to the sheet. Thus, for each full revolution of the plate and platen cylinder 10 and two full revolutions of the blanket cylinder 16, the lithographic plate carried by the plate segment is caused to be dampened and inked for transferring an ink image to the blanket 18 of the blanket cylinder 16, and the ink image transferred from the lithographic plate to the blanket 18 of the blanket cylinder 16 is transferred by the latter to a sheet fed between the printing couple formed by the blanket 18 and the platen segment 15.

It will be understood that a suitable form of drive means is provided for rotating the printing cylinder and such drive means may be embodied in the base structure 9. The drive means may include a drive gear 23 carried on a drive shaft 24 and which drive gear 23 has meshing engagement with a gear 25 carried on a shaft 26 mounted on its opposite ends in the side walls 7 and 8. The gear 26 has meshing engagement with an end gear (not shown) on the plate and platen cylinder 10 in a known manner and the plate and platen cylinder 10, in turn, is geared in a conventional way to the blanket cylinder 16 so that the drive means effects rotation of the cylinders of the press. The arrangement of the drive means is such that the plate and platen cylinder 10 and the blanket cylinder 16 are caused to be continuously rotated.

In the press, in which my present invention has been embodied, the plate and platen cylinder 10 carries sheet gripping means, as indicated generally at 30, and shown in greater detail in Figures 4 and 5. The sheet gripping means 30 is mounted across the leading edge of the platen segment 15 and comprises a shaft 32 carrying a plurality of movable gripping fingers 33, one of which is shown in Figures 4 and 5. These gripping fingers are adapted to clamp the leading edge of a sheet to a grip bar 34 secured to the platen segment. A suitable coil spring 35 is provided for each gripping finger 33. The spring member 35, as shown, is formed with coiled end portions, with the free ends thereof being anchored in the grip bar 34 and in which the coiled ends are connected by a U-shaped portion 36 adapted to extend transversely of the grip finger closely adjacent and in engagement with the free end thereof to bias normally the grip finger to closed position, with respect to the grip bar 34. The shaft 32, as shown in Figure 1, at one end thereof carries a crank arm 37 to the outer end of which a cam follower 38 is rotatably mounted. A stationary cam 39 is mounted inwardly of a side wall of the upper frame of the

press in a conventional manner and in the path of movement of the follower 38 so that as the follower 38 rides upwardly on the cam 39 each of the gripping fingers 33 is caused to be moved away from the grip bar 34 against the force of the springs 35 in proper timed sequence in the operation of the press to receive a sheet fed thereto, as from a hand feed board indicated generally at 40. If desired, suitable power drive feed roll means may be provided for effecting the delivery of the sheets to the open gripper means in lieu of the hand feed board 40, as shown in the drawing. A suitable feed mechanism for such purpose is disclosed in the aforementioned copending application of William Ward Davidson.

Referring again to Figures 4 and 5, it will be observed that a thin sheet metal ejector finger 42 is secured to the gripper finger 33 for movement therewith. Preferably an ejector finger is provided for each gripping finger 33. The ejector finger 42 is formed with a body portion 43, substantially U-shape in cross section, which fits over the top and the sides of the gripping finger 33, and further includes arms 44, the free ends of which are adapted to be engaged with the under surface of a sheet on the platen segment in stripping of the sheet from the platen segment. A gripper opening cam 45 is suitably mounted to a side wall of the press to lie in the path of the follower 38 at the rear of the press with the cam 45 serving, upon engagement of the follower 38 therewith, to rock the shaft 32 to position the gripper finger 33 and the ejector finger 44 to the position shown in Figure 7. A stripper blade member 49 extends transversely between the side walls 7 and 8 of the press and is disposed relative to the cam 45 so that upon raising of the ejector fingers 42 to the position shown in Figure 4, the sheet is positioned with the leading edge portion thereof in position above the surface of the blade 49 to effect stripping of the sheet from the platen segment of the plate and platen cylinder 10. The cam 39, previously referred to, for opening the gripper means 30 to receive a sheet, has the cam opening surface thereof with which the follower 38 is adapted to engage arranged so that the free ends of arms 44 of the ejector fingers 42 do not project beyond the periphery of the platen segment so that in opening of the gripper means to receive a sheet, the ejector fingers do not interfere with free movement of the sheet into the open gripper means 30. In this instance, however, the gripper fingers 33 are raised sufficiently so as to receive a sheet fed thereto from the hand feed board 40.

The sheet gripping means above described is similar in many respects to that shown in Patents Nos. 2,374,668, dated May 1, 1945, and 2,406,205, dated August 20, 1946, both issued to the assignee of the instant application. The sheet gripper means above described, however, is provided additionally with one or more ejector fingers 42, which, as described, serve to effect stripping of a sheet from the printing cylinder.

My present invention relates primarily to the provision of pressure roll means operable with the afore-described ejector fingers 42 and stripper blade 49 and such pressure roll means is indicated generally at 50. The pressure roll means 50, in the main, provides for effecting pressure engagement of a sheet on the platen segment in effecting stripping of the sheet therefrom with the co-operative operation of the ejector fingers and stripper blade 49 already described.

The pressure roll means 50, as best shown in

Figures 2 and 3, comprises a frame member 52 which is pivotally mounted at its opposite ends by means of pivot studs 53 and 54 mounted respectively in the side walls 7 and 8 of the frame for the press. The pivot studs 53 and 54 provide for support of the frame 52 for pivotal movement about an axis extending substantially parallel with the axis of the plate and platen cylinder 10. The frame member 52, as shown, is substantially U-shape, as viewed in plan, to provide for the support between the outer ends of the legs 56 thereof of a pressure roll shaft, indicated generally at 57. Suitable mounting bolts 58 are carried by the leg members 56 of the main frame 52 and are provided with eccentrically disposed end stud portions 59 which project into openings provided therefor at the opposite ends of the pressure roll shaft 57. The pressure roll shaft 57 provides for the support of pressure roll means which, in the particular embodiment of my invention herein disclosed, comprises two pressure rolls 60. The pressure rolls each comprise a circular disc member 62 having a hub portion 63 through which the pressure roll shaft 57 extends. A releasable leaf spring member 64 is secured at one end as by a screw 65 to each of the circular discs 62. The spring member 64 is formed with an elongated opening through which the pressure roll shaft 57 extends. Normally each leaf spring 64 has the outer or free end portion thereof normally biased in a direction for clamping a portion of the edge defining the opening therein through which the pressure roll shaft 57 extends to the latter so as to secure the pressure rolls in an adjusted position axially on the roll shaft 57. By biasing the free ends of the leaf spring members 64 toward the pressure wheels 62, the latter may be moved axially along the shaft 57 so as to engage the sheet on the periphery of the platen segment as desired in effecting the stripping of narrow or wide sheets printed by the press or for other circumstances where it may be desired to effect engagement of the pressure roll means with the sheet at a particular portion thereof.

The frame member 52, adjacent one end of the bight portion thereof, has an angle flange 65' secured thereto and to which a follower carrier member 66 is pivotally connected as at 67'. The follower carrier member 66 is formed with an upwardly extending lug or ear 67 between which and the opposed bight portion of the frame 52 a coil spring 68 is disposed. The follower carrier 66 provides for rotatably supporting a cam follower 70 by means of a pin 72 suitably secured in the carrier 66 and retained therein as by means of a snap ring 73.

The arrangement is such that spring 68 provides for normally retaining the carrier frame 66 in fixed position with respect of the frame member 52 with the spring serving, however, to yield, permitting pivotal movement of the follower carrier member with respect of the frame member 52 under certain circumstances, as will be hereinafter related.

Referring again to Figures 1 and 3, it will be observed that a coil spring 74 has connection at one end with one of the lugs of the member frame 52 and at its other end to a pin 75 carried by side wall 7. The spring 74 normally tends to bias the frame member 52 and the follower carrier 66 in a clockwise direction about the axis defined by pivot pins 53 and 54 to urge the follower 70 toward the plate and platen cylinder 10.

The plate and platen cylinder 10 is provided with a pair of form roll cams 77, one being se-

cured at each of the ends of the platen segment of the cylinder. The cam 77 lying inwardly of the side wall 7 is disposed in alignment with the cam follower 70 so that as the plate and platen cylinder rotates, engagement of the cam follower 70 with the form roll cam 77, last referred to, effects slight counterclockwise movement of the frame member 52 of the pressure roll means 50 about the axis defined by the pivot studs 53 and 54 to engage the pressure rolls 62 with the sheet on the platen segment in effecting the stripping of the sheet in the manner already above described.

The structure above noted compensates for varying thicknesses of sheets printed by the press in the following manner. The form roll cam 77 and the cam follower 70 may, for example, be adjusted to provide the desired pressure engagement of the pressure roll means 62 with a sheet of a given thickness on the platen segment. For example, this sheet may be of a minimum thickness normally used for printing purposes, say of .002 inch, with the adjustment being made to provide for the proper pressure contact of the pressure roll means 62 with a sheet of that thickness. With the press thus adjusted and upon printing sheets of greater thickness, the increased thickness of the sheet is compensated for by compression of the coil spring 68 between the frame member 52 and the follower frame carrier 66 upon engagement of the follower 70 with the form roll cam 77 so that the pressure roll means 62 effect substantially uniform pressure engagement with the sheet on the platen segment in the stripping of such thicker sheets from the platen segment.

While I have shown and described what I consider to be a preferred embodiment of my invention, it will be understood that various modifications and rearrangements may be made therein without departing from the spirit and scope of my invention.

I claim:

1. In a printing press having a printing cylinder and form cam means the combination of a frame member pivotally mounted at its opposite ends on said press about an axis extending substantially parallel with the axis of said cylinder, a pressure roll shaft mounted at its opposite ends in said frame member to extend substantially parallel with the axis of said cylinder, pressure roll means carried by said shaft for engaging a sheet carried on the periphery of said cylinder, a follower carrier frame pivoted about a fixed axis on said frame member, a cam follower rotatably mounted on said follower carrier frame for engaging the form roll cam means carried by said cylinder, resilient means positioned between said follower carrier frame and said frame member for normally preventing pivotal movement of said follower carrier frame relative to said frame member, and means for normally biasing said frame member in a direction for engaging said follower with said form roll cam means, whereby said frame member is adapted to be rotated to engage said pressure roll means with a sheet carried on said cylinder upon engagement of said follower with said form roll cam means.

2. In a printing press having a printing cylinder and form cam means the combination of a frame member pivotally mounted at its opposite ends on said press about an axis extending substantially parallel with the axis of said cylinder, a pressure roll shaft, pressure roll means carried by said shaft for engaging a sheet carried on the

periphery of said cylinder, eccentric mounting means between said frame member and said pressure roll shaft for varying the angular relation of the axis of the latter relative to the axis of said cylinder, a follower carrier frame pivoted about a fixed axis on said frame member, a cam follower rotatably mounted on said follower carrier frame for engaging the form roll cam means carried by said cylinder, resilient means between said follower carrier means and said frame member for normally preventing pivotal movement of said follower carrier frame relative to said frame member, and means for normally biasing said frame member in a direction for engaging said cam follower with said form roll cam means, whereby said frame member is adapted to be ro-

tated to engage said pressure roll means with a sheet carried on said cylinder upon engagement of said cam follower with said form roll cam means.

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