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1,970,235

SHEET HANDLING MECHANISM

Filed Oct. 13, 1930

2 Sheets-Sheet 1

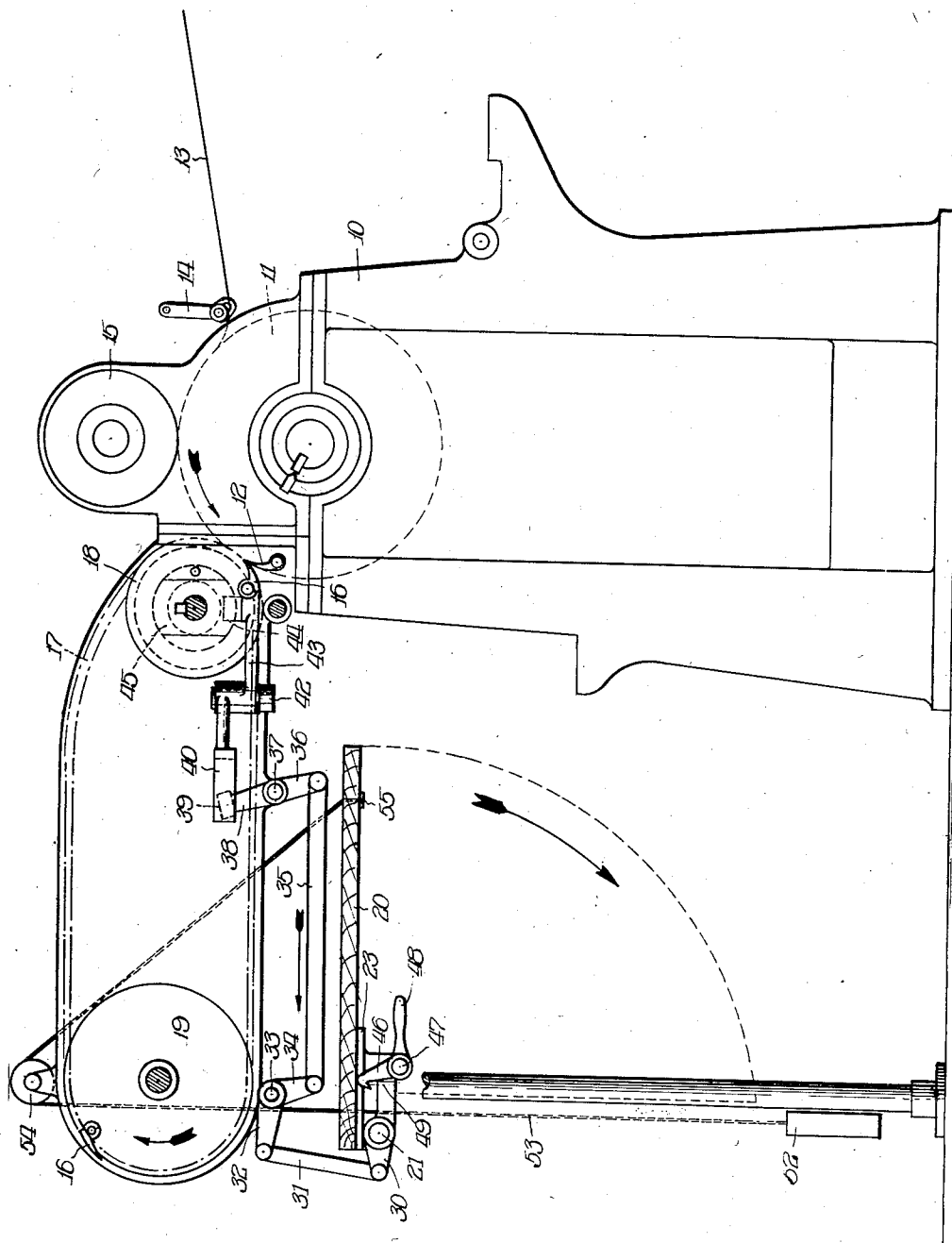


Fig. 1.

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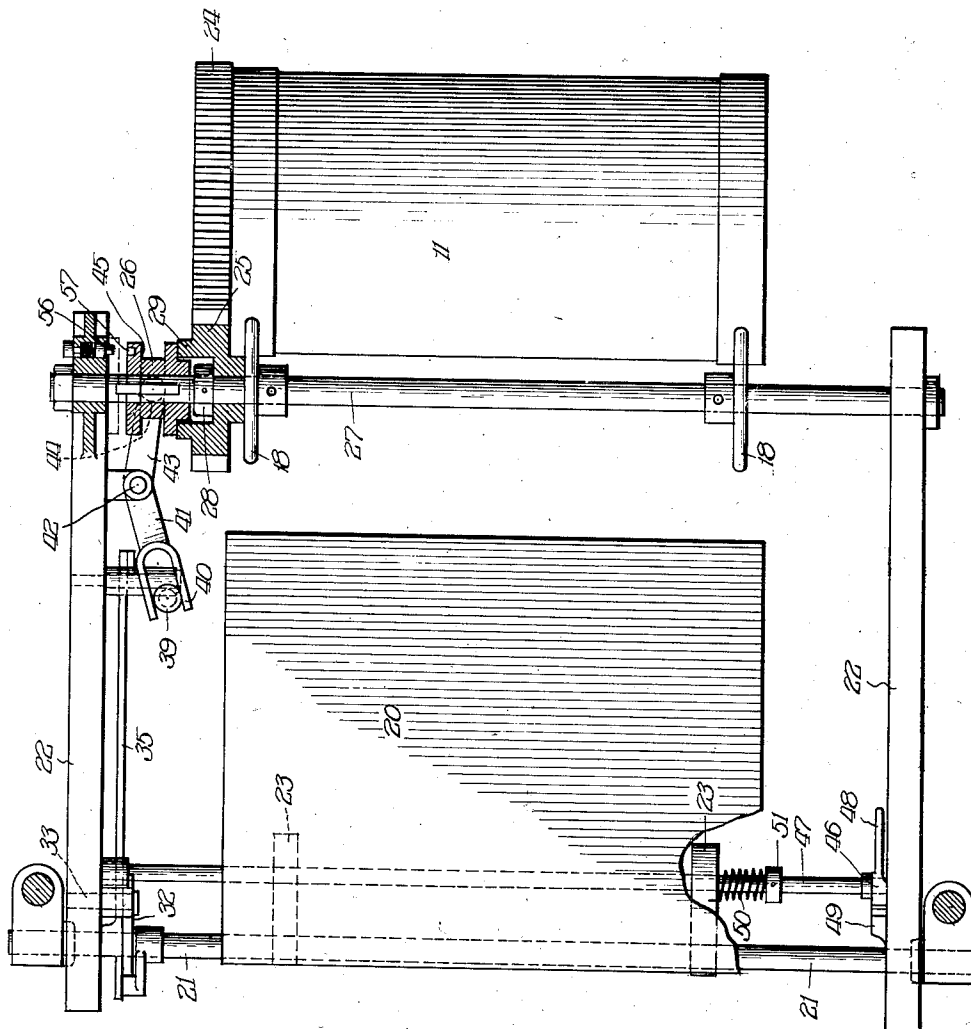


Fig. 2.

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UNITED STATES PATENT OFFICE

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SHEET HANDLING MECHANISM

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12 Claims. (Cl. 271—68)

This invention relates to sheet handling mechanisms such as are used in connection with printing presses or other machinery in which sheets of material are fed from one point to another.

My invention was conceived more specifically for use in connection with printing presses of the type in which the material to be printed is fed to and delivered from the press by automatic mechanism actuated through the driving means of the press itself. In that class of machinery, particularly during the "make ready" period, that is to say, during that time when a press is being prepared for a new job, it becomes necessary for the pressman to have access to the interior of the machine in order to attend to various adjustments before actual printing is commenced.

In order to accomplish such work it is required to intermittently run i. e. turn over the press without, however, necessarily operating the sheet feeding or sheet delivering mechanism associated with the press. In fact, with a view to safeguarding the pressman against any injury that might be caused by moving parts of the sheet conveying mechanism, it is preferable to render such mechanism inoperative for the time during which adjustments are being made on the press.

The primary object of my invention therefore resides in the provision of convenient means whereby the sheet supporting member of the sheet conveying means can be readily moved out of its operative position in order to render other parts of the machine accessible.

A further object of the invention is to provide an arrangement which will operate to stop the motion of the sheet conveying means when the sheet supporting member is in an inoperative position, and to restore the operation of said means when said member is returned to its operative position.

Other objects of my invention will become apparent from the following description and appended claims.

In order to exemplify the principle of my invention, I have shown it as applied to the delivery mechanism of a printing press, however, it will be readily understood that my invention could equally well be used in connection with the sheet feeding mechanism of printing presses or other sheet handling machinery without departing from the spirit of the invention.

One practical embodiment of the present invention is illustrated in the accompanying drawings in which:

Figure 1 is a substantially diagrammatic view

of my invention, showing it as applied to a sheet fed rotary printing press, and

Figure 2 is a partial sectional view of Figure 1, on which, however, certain parts of the printing press have been omitted.

The printing press in connection with which I have illustrated my invention by way of example comprises a frame 10 in which is mounted an impression cylinder 11 provided with sheet gripping devices 12, to which sheets, registered on the registering i. e. feed table 13, are transferred preferably by means of oscillating grippers 14 or the like.

The sheets receive the impression as they pass between the cylinders 11 and 15, which latter in this particular type of press is a blanket cylinder i. e. transfer cylinder; thereupon they are removed from the cylinder grippers 12 by the grippers 16 mounted on an endless conveyor chain 17 driven by the sprockets 18 and passing around the sprockets 19.

In the particular arrangement shown in Figure 1, the printed sheets are deposited by the gripper 16 onto a delivery table or sheet receiving board 20.

The table 20 is arranged to pivot about the axis of the shaft 21 supported in the side frames 22 and carrying the brackets 23 which are secured to the table 20.

The sprockets 18 being fast to the shaft 27 receive the rotary motion from the cylinder 11 i. e. the cylinder gear 24 through the intermediary of a gear 25 cooperating with a clutch 26 and mounted on the shaft 27 to rotate freely thereon, the gear 25 being retained in its position on said shaft by means of a collar 28. The clutch 26 is splined to the shaft 27 so that it can be moved longitudinally thereof from its operative position to its inoperative position such as I have indicated in broken lines on Figure 2, the gear 25 being provided with clutch teeth 29 which establish driving connection between the clutch 26 and the shaft 27 i. e. sprockets 18.

Referring to Figure 1, the shaft 21 has keyed thereto a lever 30, to the free end of which is pivoted a link 31. Said link in turn is connected to the free end of one arm of the bell crank lever 32 pivoted in the machine frame at 33, while the other arm 34 of said lever has pivoted thereto a link 35 which is connected to the lever 36. The latter is pivoted in the machine frame at 37 and is formed with an upwardly extending arm 38 at the extreme end of which is mounted a roller 39 which engages the bifurcated end of the bell crank lever 41 pivotally mounted at

42 in the machine frame. The arm 43 of said bell crank lever carries a roller 44 which extends into the groove 45 formed in the clutch member 26, which latter may of course be of any preferred design.

In order to retain the table 20 in its operative i. e. raised position, as indicated in Figure 1, I have provided a locking pawl 46 which is keyed to a shaft 47 pivoted in the brackets 23, said pawl being provided with an operating handle 48 by means of which it can be disconnected from the locking latch 49 provided on the frame 22.

In order to assure the locking relation between the pawl 46 and the latch 49, I preferably provide a spiral spring 50, which embraces the shaft 47 and one end of which spring is secured to the bracket 23, while the other end thereof is secured to a collar 51, rigidly mounted on the shaft 47. It will be readily understood, however, that any other desirable means may be employed for the purpose of holding the pawl 46 in engagement with the latch 49.

Preferably I also provide means for counterbalancing the table 20 which means may consist of a counterweight 52, chain or cord 53, passing over a pulley 54 and having its other end secured to the table at 55.

The operation of the preferred arrangement described is as follows:

When the operator requires access to the cylinder 11 or other interior parts of the machine, he releases the pawl 46 from the latch 49 by depressing the handle 48 and thereafter moves the table 20 downwardly so that it will assume a vertical position as indicated in broken lines in Figure 1. By moving the table 20 downwardly, the free end of the lever 30 mounted on a shaft 21 will be moved upwardly, causing to rotate the bell crank lever 32 in a clockwise direction; likewise the lever 36 due to the connecting link 35. As will be seen from Figure 1, the bifurcated end 40 of the lever 41 is angularly disposed so that when the roller 39 is moved in a clockwise direction i. e. to the right as viewed in Figure 2, it will cause the lever 41 to move in an anti-clockwise direction, thereby disengaging the clutch 26 from the clutch teeth 29 of the gear 25. Consequently the rotation of the sprockets 18 and therewith of the conveying chain 17 will be interrupted.

It might occur under certain conditions that the gear 25 binds with the shaft 27 i. e. does not freely rotate thereon, and as a consequence the rotation of the sprockets 18 might not be stopped immediately upon throwing the clutch 26 out of its operative position. Therefore, in order to safeguard against any such condition, I provide in the frame 22 a resiliently mounted locking bolt 56 which, when the clutch is moved out of its operative position, will engage a recess 45 provided in the latter and subsequently the shaft 27 and therewith the sprockets 18 will be securely locked against rotation.

While I have chosen to illustrate my invention in connection with that type of delivery mechanism commonly known in the art as a "short delivery", it will be readily understood that without departing from the principle of my invention, it could equally well be applied to that type of delivery mechanism known as an "extension" delivery i. e. pile delivery, in which case, however, the table 20 would merely serve as a support for the sheets as they are being transferred by the grippers 16 from the cylinder grippers 12 to such extension delivery.

My invention could also be used in connection

with feeding mechanism so that when the feed i. e. registering table is moved out of its operative position, by swinging it down or otherwise, the feeding mechanism will automatically be rendered inoperative so as to guard against any injury to the operator of the printing press or any other sheet handling machinery to which my invention is applied.

I claim:

1. In sheet handling mechanism, the combination of movably mounted sheet supporting means, endless sheet conveying means adapted to deposit printed sheets onto said supporting means, and means for controlling the operation of said conveying means by said supporting means.

2. In sheet handling mechanism, the combination of movably mounted sheet supporting means, endless sheet conveying means adapted to deposit printed sheets onto said supporting means, a clutch device associated with said supporting means and said conveying means and operative to drive said sheet conveying means, and means whereby said clutch device is rendered inoperative by moving said supporting means out of its sheet supporting position.

3. In sheet delivery mechanism, the combination of endless sheet conveying means, sheet receiving means, mechanism whereby said sheet receiving means can be moved out of its sheet receiving position, and means whereby said sheet conveying means is rendered inoperative by moving said receiving means out of its sheet receiving position.

4. In sheet delivery mechanism, the combination of endless sheet conveying means, pivoted sheet receiving means, manually operated mechanism whereby said sheet receiving means can be swung down out of its sheet receiving position, and means whereby said sheet conveying means is rendered inoperative by moving said receiving means out of its sheet receiving position.

5. In sheet delivery mechanism, the combination of sheet conveying means including an endless chain and sheet engaging grippers mounted thereon, sheet receiving means, manually operated mechanism whereby said sheet conveying means is automatically rendered inoperative by moving said receiving means out of its sheet receiving position.

6. In sheet handling mechanism, the combination of endless sheet conveying means adapted to receive printed sheets from a printing member, a supporting member, normally adapted to receive sheets from said means, means whereby said supporting member can be swung down out of its sheet supporting position, and means for tripping said conveying means when said supporting member is swung down out of its sheet supporting position.

7. In sheet handling mechanism, the combination of endless sheet conveying means adapted to receive printed sheets from a printing member, a supporting member, normally adapted to receive sheets from said means, manually operated means whereby said supporting member can be swung down out of its sheet supporting position, and means including link connections associated with said supporting member for automatically tripping said conveying means when said supporting member is swung down out of its sheet supporting position.

8. In sheet handling mechanism, the combination of sheet conveying means, a counterbalanced sheet support, normally adapted to receive sheets from said conveying means, means to lock said

support in its operative position and adapted to be released manually so that said support may be swung down into an inoperative position, and means whereby said sheet conveying means is rendered inoperative by swinging said support downwardly.

9. In sheet handling mechanism, the combination of sheet conveying means, a counterbalanced support, normally adapted to receive sheets from said conveying means, means to automatically lock said support in its operative position and adapted to be released manually so that said support may be swung down into an inoperative position, and means whereby said sheet conveying means is rendered inoperative by swinging said support downwardly.

10. In sheet handling mechanism, the combination of a counter-balanced sheet supporting table, sheet conveying means adapted to deposit printed sheets onto said supporting table, driving means for said conveying means, means whereby said supporting table can be swung down out of its sheet supporting position, and mechanism controlled by the movement of said sheet

supporting table to disconnect said driving means from said sheet conveying means when said sheet supporting table is swung down out of its sheet supporting position, and to restore connection between said driving means and conveying means when said supporting table is returned to its operative position.

11. In sheet handling mechanism, the combination of a movably mounted delivery table, an endless sheet conveyor to deposit sheets onto said table, and coupling mechanism associated with said delivery table and conveyor arranged to render said conveyor inoperative when said delivery table is moved out of its sheet receiving position.

12. In sheet handling mechanism, the combination of a movably mounted delivery table, an endless sheet conveyor to deposit sheets onto said table, and coupling mechanism associated with said delivery table and conveyor arranged to render said conveyor inoperative when said delivery table is moved out of its normal operative position.

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