Oct. 27, 1936. J. F. JIROUSEK 2,058,888

PRINTING PRESS CYLINDER MECHANISM

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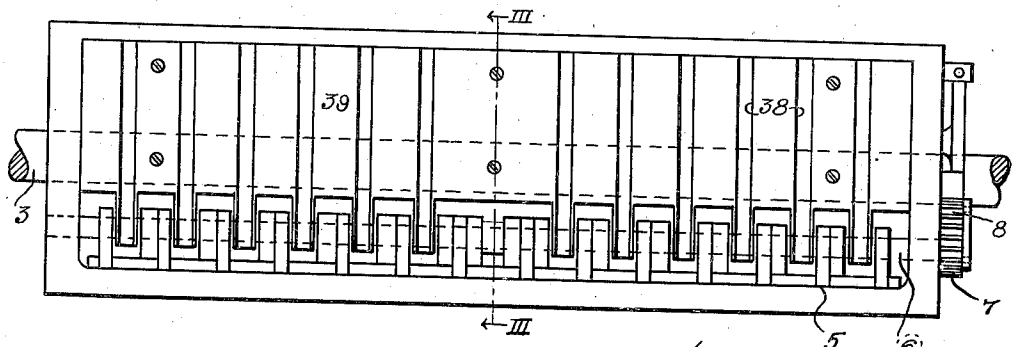


Fig. 1

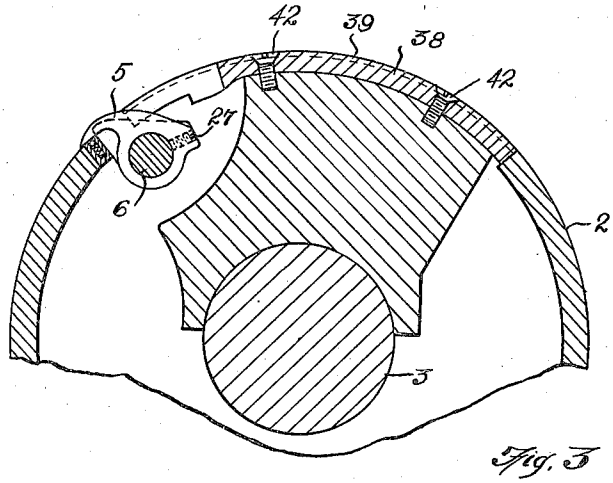


Fig. 3

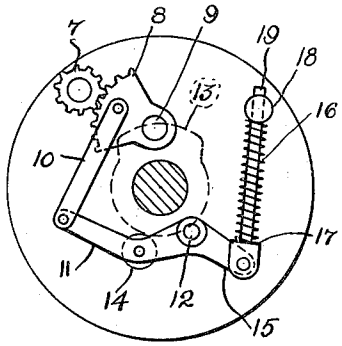


Fig. 2

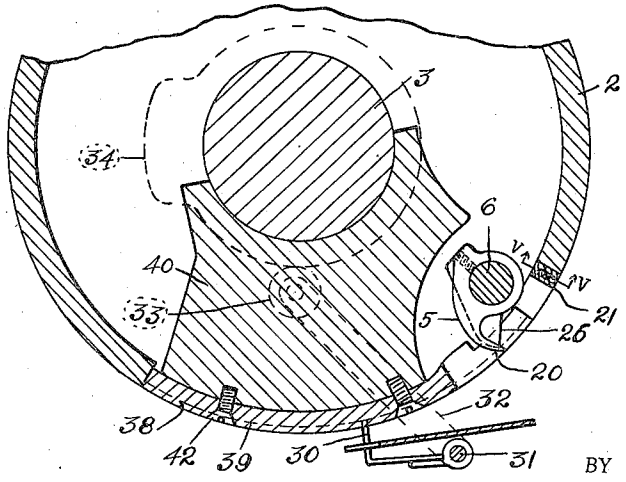


Fig. 4

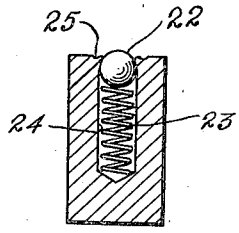


Fig. 5

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PRINTING PRESS CYLINDER MECHANISM

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Application June 10, 1935, Serial No. 25,754

11 Claims. (Cl. 101—409)

This invention relates to printing presses and more particularly cylinder mechanism; and it is among the objects of the invention to provide construction for accurate holding and releasing of sheets of paper for printing and the like. Other objects and advantages will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail an illustrative embodiment of the invention, this being indicative, however, of but one of the various ways in which the principle of the invention may be employed.

In said annexed drawing:—

Fig. 1 is a plan view of a cylinder in accordance with the invention; Fig. 2 is an end elevation of the same; Fig. 3 is an enlarged fragmentary section, taken on a plane substantially indicated by line III, Fig. 1; Fig. 4 is a similar view with the cylinder rotated a further half turn; and Fig. 5 is a considerably enlarged sectional detail taken on the plane substantially indicated by line V, Fig. 4.

Referring more particularly to the drawing, there is shown a cylinder comprising a shell 2 which may be of usual steel or iron construction, the cylinder shell being carried by a shaft 3, which is mounted in the frame of the printing press, as need not be here detailed. The shell 2 is longitudinally cut out to receive gripper mechanism, this including grippers 5 which are carried by a rock shaft 6, which in turn is mounted in the ends of the cylinder. One end of the rock shaft 6 is provided with a gear pinion 7 which meshes with a gear-segment 8 pivotally mounted at 9 on the end wall of the cylinder. The gear-segment 8 is connected by link 10 to an actuating arm 11, the latter being pivotally mounted at 12 on the cylinder end, such as to be operated by a stationary cam 13 in conjunction with a roller 14 which is carried by the arm. An extension arm 15 is arranged to receive the thrust of a return-spring 16, this seating between a shoulder 17 on extension arm and a projection 18 on the cylinder end-wall. The spring 16 conveniently may surround a stem 19 which may have a slide mounting in the projection 18. The cam 13 is thus seen to occasion the rocking of the arm 11 on each revolution of the cylinder, with a corresponding oscillation of the gear-segment 8 and a rocking of the gripper shaft 6. The arrangement of the cam 13 is such that the gripper-shaft 6 is rocked into open or receiving position in the upper and rear portion of its circuit of revolution and, as illustrated in Fig. 4, such open position involves angular relation of the beak 20 of the gripper with relation to the underlying or anvil-portion of the cylinder shell 21. The latter carries sheet-releasing or clearing means, whereby accidental sticking of the printed sheet to the cylinder is obviated on the raising of the gripper.

As is shown more particularly in Fig. 5, such sheet-releasing means comprises a plunger, which is desirably in the form of a ball 22 urged into outward position by a spring 23, the latter and the ball 22 being in a recess or bore 24 in the cylinder shell. A slight over-hang 25 of the metal wall at the outer end of the bore 24 serves to prevent complete escape of the ball 22. As is thus apparent, the ball 22 or releaser is in such position as to be pressed inwardly by the gripper-beak 20 when the latter seizes the sheet of paper, and during the portion of the revolution of the cylinder, while the paper is gripped, the releaser-ball 22 is forced down into its recess 24 by the pressure of the gripper, but immediately on the raising movement of the gripper, the releaser-ball 22 is projected by the spring 23 such as to push the sheet free from adhesion to the cylinder and thus allow of its being cleared therefrom without a mishap.

Adjacent the gripper is a gauge for the front edge of the sheet. This may take the form of a front-edge gauge 26 of segmental or projection shape, and the gripper and gauge may both conveniently be mounted on the rock shaft 6 by set screw means 27. The number of grippers may vary, in accordance with the particular requirements in any case, but in general will be sufficient to adequately grip the sheet throughout its width. By a corresponding placement of a front-edge gauge 26 with each gripper adjacent thereto, an accurate register or gauging of the position of the edge of the sheet is assured. The series of gauge elements 26 is thus in such relation to the grippers that movement in common is had, and when the gripper-beaks 20 are in open position (as illustrated in Fig. 4), the gauges 26 are in position to receive the front edge of the sheet thereagainst as the sheet is forwarded into such position by means which need not here be detailed.

With the further revolution of the cylinder, the rock shaft 6 carrying the grippers and the gauge elements is oscillated such as to set the gripper-beaks 20 down upon the paper sheet and the underlying releaser-ball 22 and such clamp position is maintained through the fur-

ther turning of the cylinder to its opening position, where the rock shaft **6** is re-oscillated into gripper-open position.

For preventing the over-run of the sheets as fed to gripping position, a further safeguard is had in the stop **30**, which is arranged adjacent the cylinder and preferably at its lower side. Such stop may comprise a series of fingers carried by a rock shaft **31**, which is oscillated to periodically raise and lower the stop-fingers **30** in timed relation with the revolution of the cylinder, whereby the stop is in operating position at the time that the front edge of the sheet is being brought against the cylinder gauges **26** and into the open grippers. For oscillating or rocking the shaft **31** and the stop **30**, a rocker arm **32** is provided on the shaft **31**, and through the intermediary of a roller **33** is periodically actuated by a cam **34** at the end of the cylinder. To allow close proximity of the stop **30**, the cylinder wall is provided with grooves or recesses of sufficient length to at least allow the stops **30** to be raised into position beyond or within the contour-limit of the cylinder for the short period during which the sheet is being charged to the grippers. Advantageously, such grooves **38** may be provided in the cover plate **39** proportioned to fit into and cover the opening left by the cut-out section in the cylinder wall. The placement of the gripper shaft **6** and associated mechanism off center in the cylinder tends to destroy accuracy of balance, and in very high speed operation an objectionable vibration would develop. This tendency is obviated by placement of suitable counterweight means **40**. This may take the form of segments secured to the shaft **3** of properly adjusted weight. The cover plate **39** may then be held in place by screws **42**. Desirably, the cover plate may be of light metal, in contrast to the heavy ferrous metal of the shell **2**, for instance, aluminum, aluminum alloys, etc.

The manner of operation of the mechanism will be clear from the foregoing. Sheets of paper to be printed are fed in rapid succession by the feeding means, not shown, and as the front edge of each sheet advances to cylinder-gripping position, the sheet-stop **30** is in its raised or operating position, as indicated in Fig. 4, the timing being such that the front edge of the sheet is pushed by the feed mechanism against the stop **30** and against the gauge-members **26** which are then in such position. Correspondingly the gripper-beaks **20** are open. With the advance edge of the paper sheet thus pushed into position against the stop **30** and gauging elements **26**, further turning of the cylinder takes the cam roller **14** and the cam roller **33** into their respective positions to rock the gripper-shaft **6** to close the grippers and rock the stop-shaft **31** to drop the stop **30** out of the path of the sheet, so that it may thence be carried around by the cylinder. At the same time that the gripper-beaks **20** seize the sheet, the gauges **26** are in their advance or gauging position and accuracy of placement is attained. With the closing of the gripper-beaks **20**, the sheet of paper is of course clamped down upon the cylinder shell and the releaser-balls **22**, there being a number of these corresponding to the number of the grippers or at least a sufficient number to secure adequate freeing of the sheet when the grippers open. As seen, the thrust of the spring **23** insures the throw-out of the releaser-ball **22** immediately on the raising of the gripper-beak. With the paper sheet thus ungripped and also thrust loose from the cylinder, further delivery mechanism, whose detail is immaterial here, carries the printed sheet to the delivery table.

This application is a continuation-in-part of my application Serial No. 717,028, filed March 23, 1934.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the means stated by any of the following claims, or the equivalent of such means, be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In printing press cylinder mechanism, a cylinder, grippers carried thereby, paper-stops movable within the peripheral boundary of said cylinder, and clearance-grooves in that portion of the periphery of said cylinder where said stops enter.

2. In printing press cylinder mechanism, a cylinder having a longitudinally cut-out section, gripper mechanism in such cut-out section, a cover plate for the cut-out, paper-stops movable within the peripheral boundary of said cylinder, and clearance-grooves in said cover plate adjacent said stops.

3. In printing press cylinder mechanism, a heavy metal cylinder shell having a longitudinally cut-out section, gripper mechanism and weighting means in such cut-out section, and a light metal cover plate for the cut-out.

4. In printing press cylinder mechanism, a heavy metal cylinder shell having a longitudinally cut-out section, gripper mechanism and weighting means in such cut-out section, a light metal cover-plate for the cut-out, and clearance-grooves in said cover plate adjacent said stops.

5. In printing press cylinder mechanism, a cylinder, a gripper for holding a paper sheet to the cylinder, a releaser reciprocable in the cylinder under said gripper, said releaser having a surface movable with the sheet to prevent drag on the same, and a spring normally pushing said releaser outwardly.

6. In printing press cylinder mechanism, a cylinder, a gripper for holding a paper sheet to the cylinder, a bore in said cylinder under the gripper, and a resiliently protrudable freely rotatable ball in such bore.

7. In printing press cylinder mechanism, a cylinder, a rock shaft mounted in said cylinder, a gripper carried by said rock shaft for holding a paper sheet to the cylinder, and a front-edge paper gauge on said rock shaft alongside said gripper movable with said gripper.

8. In printing press cylinder mechanism, a cylinder, a rock shaft mounted in said cylinder, a gripper carried by said rock shaft for holding a paper sheet to the cylinder, a front-edge paper gauge on said rock shaft alongside said gripper movable with said gripper, and set screw means for regulably securing said gripper and said gauge to said rock shaft.

9. In printing press cylinder mechanism, a cylinder having a longitudinal cut-out section, gripper mechanism in said cut-out section, a rock shaft carrying said gripper mechanism, a paper-stop cooperating with said cylinder, means for reciprocating said stop toward and away from said cylinder on each revolution thereof, and a front-edge paper gauge on said rock shaft.

10. In printing press cylinder mechanism, a cylinder having a longitudinal cut-out section, gripper mechanism in said cut-out section, a rock shaft carrying said gripper mechanism, a cover

plate for said cut-out, paper stops movable to within the peripheral boundary of said cylinder, clearance-grooves in said cover plate adjacent said stops, and a front-edge paper gauge on said rock shaft.

11. In printing press cylinder mechanism, a cylinder having a longitudinal cut-out section, gripper mechanism in said cut-out section, a rock shaft carrying said gripper mechanism, a paper-stop cooperating with said cylinder, means for reciprocating said stop toward and away from said cylinder on each revolution thereof, and a front-edge paper gauge regulably secured on said rock shaft.

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