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PRINTING PRESS WITH FLEXIBLE WORK SUPPORT PLATE

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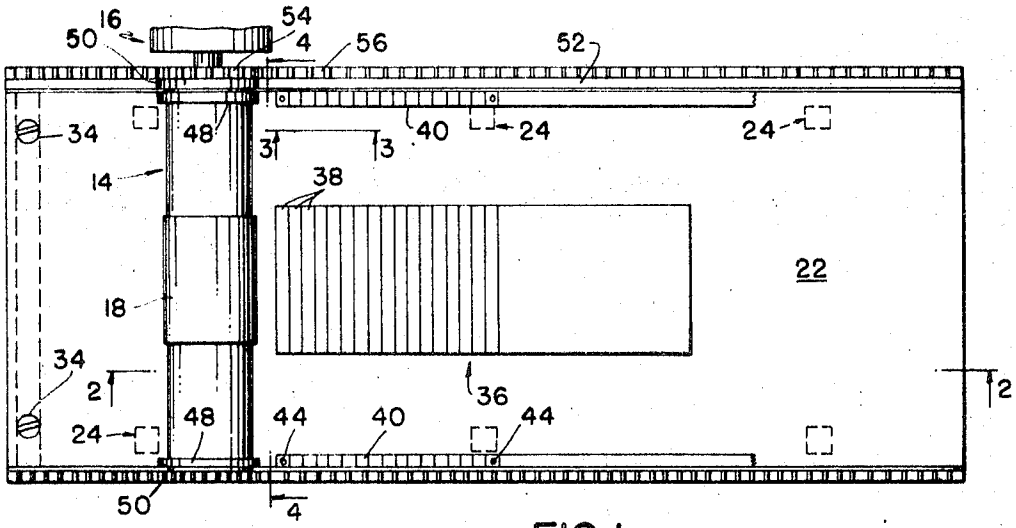


FIG. 1

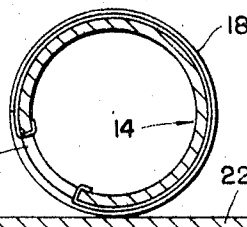
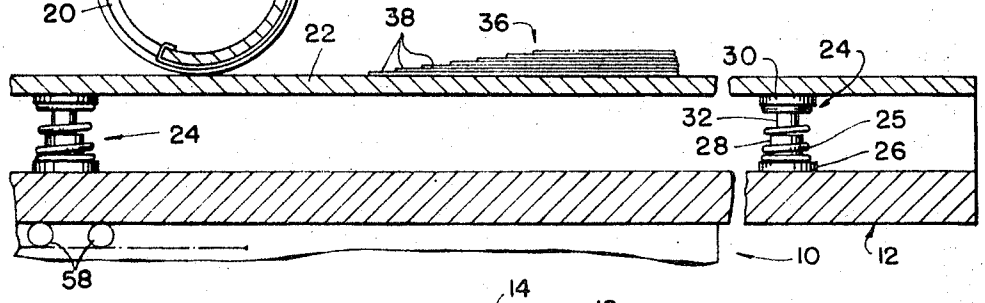


FIG. 2



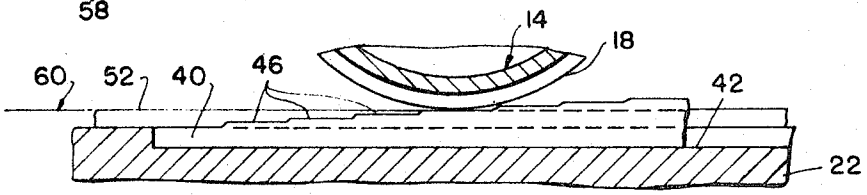


FIG. 3

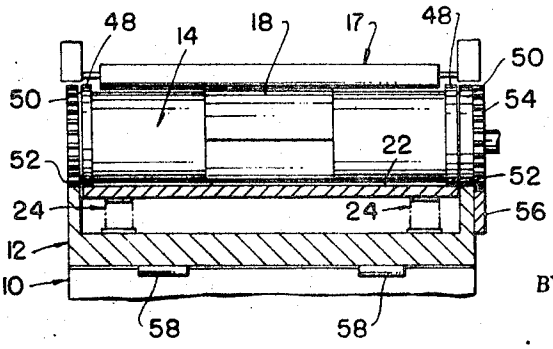


FIG. 4

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PRINTING PRESS WITH FLEXIBLE WORK SUPPORT PLATE

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ABSTRACT OF THE DISCLOSURE

A rotary printing press adapted to print the marginal portions of stacked sheets of material arranged in shingle fashion including a rotary printing cylinder and a flexible and resiliently supported movable plate on which the stacked sheets are carried beneath the cylinder to be printed, and gauge means on the plate engaged by the cylinder to depress the plate so that the marginal portions of successive sheets in the stack are brought down into the printing plane of the press as they pass under the cylinder.

In rotary presses of the type having a rotary printing cylinder on which a printing plate is mounted and a movable bed on which the material to be printed is supported for movement beneath the cylinder to receive print from the printing plate, the cylinder is rotatable on a fixed axis and thus the printing plate establishes what may be referred to as a fixed printing plane suitable for printing on a single thickness of paper or other material to be printed. With conventional presses of this type it is not possible to satisfactorily print stacked sheets of material arranged in shingle fashion because as each sheet is placed on the preceding sheet the thickness of the stack increases and the exposed marginal portions of all but the first sheet in the stack do not lie in the printing plane established for the press. The present invention is directed to a press of this type provided with means for automatically bringing the exposed portion of each sheet in a stack to be printed into the printing plane as such portions of the sheets are brought beneath the rotating cylinder to receive print from the printing plate thereon. By means of the present invention it is possible to use a rotary press of the type described for many purposes not suitable for presses of this type as they are presently constructed.

It is therefore an object of the invention to provide a new and improved rotary printing press adapted to print the marginal portions of stacked sheets of material arranged in shingle fashion.

In the drawings:

FIGURE 1 is a top plan view of a portion of a press embodying the present invention;

FIGURE 2 is an enlarged fragmentary sectional view taken on line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged fragmentary sectional view taken on line 3—3 of FIGURE 1, showing the bed of the press advanced to an intermediate position beneath the cylinder; and

FIGURE 4 is a sectional view taken on line 4—4 of FIGURE 1.

A rotary printing press of the type to which the present invention is directed includes a base 10 having a linearly movable bed 12 mounted thereon and a rotary printing cylinder 14 above the bed 12. The cylinder 14 is driven through a suitable motor and transmission means 16 supported on the base 10. The press includes conventional inking rolls 17 illustrated in part in FIGURE 4.

In a press of this type a printing plate 18 is wrapped around the cylinder 14 and secured thereto in any suitable manner at its opposite ends which may extend through an opening 20 in the cylinder 14. The printing plate 18 may consist of a rubber plate or mat mounted on a strip of material which is secured to the cylinder. Any conventional type of printing plate used on rotary presses of this type may be employed in the present invention. The cylinder 14 rotates on a fixed axis and the outer surface of the printing plate carrying the letters or other characters to be printed establishes a printing plane for the press.

A support plate 22 carried by the bed 12 is movable beneath the cylinder 14 and is normally positioned in relation to the axis of the cylinder 14 to satisfactorily print a single sheet of material placed on the plate 22. According to the present invention the support plate 22 is somewhat flexible and is resiliently supported on the bed 12 by a series of resilient supports 24 each including a spring 25 confined between the head 26 of a sleeve member 28 mounted on the bed 12 and the head 30 of a plunger 32 mounted on the under side of the plate 22 in telescoping relation to the sleeve member 28. The plate 22 is secured to the bed 12 at its forward end by means of bolts 34, while the remainder of the support plate 22 is supported by the spring supports 24 which may be placed along opposite sides of the plate 22 at spaced intervals.

In FIGURES 1 and 2 threre is illustrated a stack 36 of a plurality of sheets of paper or other material to be printed arranged in shingle fashion to leave marginal portions 38 exposed to receive print from the printing plate 18 on the cylinder 14 as the bed 12 and the stack 36 carried on plate 22 move linearly beneath the rotating cylinder 14. It is apparent that the marginal portions 38 of the successive sheets in the stack are spaced above the printing plane of the press and that in conventional presses in which the support plate 22 is fixed and rigid the sheets in the stack following the first sheet cannot be satisfactorily printed because they will not lie in the printing plane at the time they pass beneath the printing cylinder. In accordance with the present invention, the flexible support plate 22 is deflected by the cylinder 14 an amount equal to the thickness of the stack of sheets passing beneath the cylinder so that the exposed marginal portions of the sheets are all brought into the printing plane at the time they receive print from the printing plate.

The support plate 22 is provided along its opposite side edges with gauges 40 which are disposed within recesses 42 at the edges of the plate 22 and properly located within the recesses 42 by locator pins 44. As shown in FIGURE 3, the gauges 40 comprise an elongated strip of metal having a plurality of steps 46 thereon. The height of the steps 46 corresponds to the thickness of a sheet of material to be printed and the longitudinal spacing of the steps 46 corresponds to the dimension of the exposed marginal portions 38 in the direction of travel of the stack 36.

The support plate 22 has suitable locating means thereon (not shown) to properly locate the stack 36 on the plate 22 in such position that as the stack is moved beneath the rotating cylinder 14 each of the marginal portions 38 will receive from the printing plate 18 the impression to be printed thereon. The several sheets in the stack 36 are first arranged in the desired shingle fashion and secured together to form the stack which is then placed on the plate 22 in the proper position.

The cylinder 14 includes deflector rings 48 adjacent its opposite ends which are of such diameter as to make contact with the edge portions of the plate 22 as shown in FIGURE 4. The cylinder also includes bearing portions 50 disposed outwardly of the deflector rings 48 which ride on the side edges 52 of the bed 12. A gear 54 mounted on one end of the cylinder 14 engages a rack 56 secured to

the bed **12** for moving the bed **12** upon rotation of the cylinder **14**. The bed **12** is movably mounted on base **10** by rollers **58**.

As the plate **22** moves beneath the cylinder **14**, the deflector rings **48** engage gauges **40** to deflect the plate **22** increasing amounts corresponding to the increasing thickness of the stack **36** as each successive marginal portion **38** is brought beneath the cylinder **14**. In FIGURE 3 the plate **22** is shown to be depressed below the printing plane indicated at **60** an amount equal to four thicknesses of the material being printed to bring the portion **38** of the sheet being printed into the printing plane.

In some cases it may be possible to utilize the stack **36** as the means for deflecting the support plate **22** increasing amounts as the stack moves beneath the cylinder **14**. In cases in which the sheets to be printed are of sufficient width, the edge portions thereof might be engaged by deflector rings on the cylinder to deflect the plate **22** and thereby bring each marginal portion **38** into the proper printing plane.

The spring devices **24** hold the plate **22** and the sheets being printed firmly against the cylinder **14** while allowing deflection of the plate without vibration or chattering. The number and location of the spring supports may be varied as desired. The plate **22** may be made of aluminum or other metals or of other materials having the ability to flex as required.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification, and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

What I claim as my invention is:

1. A rotary printing press adapted to print marginal portions of stacked sheets of material arranged in shingle fashion, comprising a rotary printing cylinder and a linearly movable bed adapted to carry the stacked sheets beneath the cylinder to receive print from a printing plate mounted on said cylinder, a flexible support plate secured to said bed and on which said sheets are supported, resilient means between said bed and support plate normally positioning the latter relative to said cylinder to position a single sheet of material on said support plate in a printing plane established by said printing plate, said resilient means yielding to permit deflection of said support plate away from said cylinder as said bed moves beneath said cylinder thereby to bring the marginal portions of successive sheets into said printing plane.

2. A press according to claim **1** wherein said cylinder is provided with a deflector ring and said support plate is provided with gauge means thereon engageable by said deflector ring as said stacked sheets move beneath said cylinder to effect said deflection of said support plate.

3. A press according to claim **2** wherein said gauge means comprises a longitudinally extending strip having steps thereon corresponding in height and longitudinal dimensions respectively with the thickness of a single sheet of material and the longitudinal dimensions of said marginal portions of the stacked sheets.

4. A press according to claim **3** wherein each end of said cylinder is provided with a deflector ring and each side of said support plate is provided with one of said strips.

5. A press according to claim **1** wherein said cylinder and said support plate are provided with interengageable means for deflecting said support plate upon movement of said bed beneath said cylinder.

6. A rotary printing press adapted to print marginal portions of stacked sheets of material arranged in shingle fashion, comprising a rotary printing cylinder and a linearly movable bed adapted to carry the stacked sheets beneath the cylinder to receive print from a printing plate mounted on said cylinder, a flexible support plate mounted on said bed for movement therewith and on which said sheets are supported, resilient means between said bed and support plate normally positioning the latter relative to said cylinder to position a single sheet of material on said support plate in a printing plane established by said printing plate, and means to depress the portion of said support plate passing beneath said cylinder an amount substantially equal to the thickness of that portion of the stack passing beneath said cylinder thereby to bring the marginal portions of successive sheets into said printing plane.

7. A press according to claim **6** wherein said means for depressing said plate comprises a gauge means interposed between said cylinder and support plate and having steps thereon corresponding in height and length respectively with the thickness of a single sheet of material and the length of the exposed marginal portions of the stacked sheets.

8. A press according to claim **7** wherein gauge means are mounted on said plate along its side edges, and deflector rings on opposite ends of said cylinder are adapted to ride up on said steps as said plate passes beneath said cylinder.

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101—407