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CYLINDER PRINTING MACHINES

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2 Sheets-Sheet 2
The present invention relates to printing presses and more particularly to rotary cylinder printing presses.

Printing presses, of the rotary cylinder type, having a reciprocably driven flat printing form and a curved printing form coactive with the rotary impression cylinder in carrying out printing operations are generally provided with separate inking systems for inking the flat and curved printing forms respectively. Accessibility for making ready operations on the impression cylinder and the cylinder on which the curved printing plate is mounted in this type of printing press has been unsatisfactory heretofore. It has already been proposed to improve accessibility by disposing the curved form approximately at the level of the longitudinal axis of the impression cylinder, however, accessibility continues to be a problem.

A principal object of the present invention is to improve access to the impression surface of the impression cylinder and to the curved printing form for making ready operations in printing presses of the aforementioned type.

A feature, according to the present invention, is the provision of an inking system, for inking the curved printing form, which has a plurality of swing-away inking rollers and application rollers which can be pivotally moved or positioned in an operative position for coaction with the curved printing form and can be positioned jointly in a position radially spaced from the curved printing form and the impression cylinder to provide easy accessibility.

The swing-away inking and application rollers are pivotally mounted between two laterally spaced members forming the side walls of the inking system coactive with the curved printing form and also forming the side walls of a second inking system coactive with a flat reciprocably driven flat printing form.

According to the invention, accessibility to the impression cylinder can be further improved by removal of the curved printing form and the application rollers when carrying out printing work in which the curved printing form is not necessary, as for example when carrying out single color printing work.

Other features and advantages of the arrangement in accordance with the present invention will be better understood as described in the following specification and appended claims in conjunction with the following drawings in which:

Fig. 1 is a diagrammatic side elevation view of a printing press provided with an inking system, according to the invention, for inking a curved printing form and is illustrative of the inking system in operative position.

Fig. 2 is a diagrammatic side elevation view similar to Fig. 1 and illustrates the position of the inking system of Fig. 1 when displaced radially outwardly from a curved printing form and impression cylinder to provide access thereto.

Fig. 3 is a front elevation view illustrating a group of swing-away inking rollers and application rollers and the mounting thereof in the inking system for inking a curved form of the press shown in Figs. 1 and 2, and Fig. 4 is a view corresponding to the view in Fig. 2 illustrating the improved accessibility to the impression cylinder surfaces when the curved printing form and the application rollers are removed from the press and the inking system for the curved form.

According to the drawings, an impression cylinder 1 of a cylinder printing machine is rotatably driven by known means, not shown, in a counterclockwise direction indicated by the arrow. Cylinder grippers 2 are shown as having gripped a sheet 3 delivered from a feed table 4, for example, by means of swinging auxiliary grippers 5 shown schematically. The sheet 3 is printed by curved printing plates or cliches 6 which are mounted on a curved cylinder 7 coacting with impression cylinder 1. The curved cylinder 7, for example executes two revolutions in a clockwise direction as indicated by the arrow while the impression cylinder 1 executes one revolution. The inking of the cliches 6 is effected by an inking system comprising three application rollers 8, 8' and 8'', which make contact with ink cylinders 9 and 10. The ink is transferred from an ink cylinder 13 to the application rollers by spreading rollers 11 and 12.

A vibrator roller 14 transfers, in known manner, the ink received from a duster roller 15 of a duct 16 to the ink cylinder 13.

The whole roller group comprising rollers 8 to 13 is pivotally mounted (Fig. 3) between laterally spaced members 17 and 17', which are pivotally mounted by pins 18 and 18' on members 19 and 19' forming the side walls of the aforementioned inking system and a side wall of the inking system later herein described. The two side wall members 17 and 17' are each provided on an upper end thereof with respective toothed sectors 20 and 20' engaged by pinions 21 and 21' fixed on a shaft 22. The shaft 22 is rotatably mounted in the two side walls 19 and 19' of the inking system. A worm wheel 23, which is also fixed to the shaft 22, engages a worm 24. The worm 24 is fixed on a shaft 25 rotatably mounted on the side wall 19' and which is provided with a hand wheel 26 for selectively rotating it. It being understood that the inking system rollers are operably driven by known means, not shown, when in operative position with roller group 8-13.

When the hand wheel 26 is turned by the pressman, the two side wall members 17 and 17' are displaced about the pins 18 and 18' whereby the whole inking cylinder and application roller group mounted thereon are displaced from an operative position shown in Fig. 1 to a second position radially spaced outwardly from cylinder 7 and the plate 6 thereon. It being understood that the wheel 26 can be operated to swing the inking system back to a position shown in Fig. 1 where it is coactive with the printing form or plate 6. In the outwardly displaced position shown in Fig. 2, the curved cylinder 7 and form 6 thereon are freely accessible without obstruction from the curved form inking system. The mounting, removal and necessary adjusting in a registering position of the curved plates or cliches can thus be readily accomplished.

Four application rollers 27, 27', 27", 27"' are provided, as part of another inking system, for inking a flat letterpress form 28, in known manner, which is reciprocated on a base 29 to carry out printing strokes in timed relation with the impression cylinder and the cylinder 7. After the curved printing form impresses the sheet 3, the impression of the flat printing form 28 is subsequently carried out so that the sheet 3 is printed in two inks and is delivered in known manner.

The spreading and supply of ink to the application rollers 27, 27', 27", 27"' is effected, in known manner, by a number of inking cylinders, as shown, and spread-
ing rollers from a duct 30 by means of a ductor roller 31 and vibrator roller 32. The various rollers are driven by known means, not shown. The space between the two ducts 16 and 30 is so dimensioned that the roller group, comprising rollers 8 to 13, when outwardly displaced from the curved cylinder, is accommodated in this space.

Fig. 4 shows yet another feature of the invention for improving access to the impression surface of the impression cylinder 1 when printing is to be carried out only with the flat form 28 and the inking system associated therewith. To attain such improved access, as for example when printing in one color, the cliche 6 is removed from the curved cylinder 7. Moreover, the application rollers 8, 8' and 8" are removed from the outwardly displaced curved form inking system. As clearly shown in Fig. 4 by removal of the curved plate jacket from the curved form cylinder and removal of the application rollers from the outwardly displaced curved form inking system, considerable access space is obtained which further makes it easier to carry out make-ready operation on the impression surface of the impression cylinder 1.

While a preferred embodiment of the invention has been shown and described, it will be understood that many modifications and changes can be made within the scope of the invention.

What I claim and desire to secure by Letters Patent is:

1. In a rotary cylinder printing press having a rotatably driven impression cylinder, in combination, a flat printing form reciprocally driven in timed relation with said cylinder and coact therewith to carry out printing strokes, a rotatably driven curved printing form having an axis of rotation substantially in a plane corresponding with the longitudinal axis of the impression cylinder and disposed relative to the impression cylinder in the direction of rotation of the impression cylinder to coact with the cylinder to carry out printing operations in timed relation with the printing strokes of the flat printing form, a first inking system comprising a first ink duct radially spaced from the curved form for inking the flat printing form, a second inking system having pivotally mounted means including a plurality of swing-away, inking rollers mounted as a unit and coact in an operative position for inking the curved printing form, means selectively operable for operating said pivotally mounted means to position the swing-away rollers jointly as a unit in said operative position coacting with the curved printing form and for positioning said swing-away rollers jointly in a position radially spaced from the curved form in a direction away from the impression cylinder to provide easy access to the curved form and the impression cylinder, and said second inking system comprising a second ink duct vertically spaced from the first duct defining a vertically extending space between them large enough to receive all of the swing-away rollers when positioned as a unit radially spaced away from said curved form.

2. In a rotary cylinder printing press according to claim 1, in which said pivotally mounted means includes pivot means for pivotal mounting disposed at a level below said first ink duct.

3. In a rotary cylinder printing press according to claim 1, in which said pivotally mounted means of said second inking system comprises a pair of laterally spaced members rotatably mounting the swing-away rollers between them and spaced outwardly of the first and second ducts, and pivot means providing pivots for said laterally spaced members disposed at a level below said first ink duct.

4. In a rotary cylinder printing press according to claim 3, in which said laterally spaced members comprise arcuate gear sectors and in which said operating means comprises gear means coact with said sectors for pivotally rotating said lateral members.

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