

[54] **DAMPING DEVICE FOR ROTARY OFFSET PRINTING MACHINE**  
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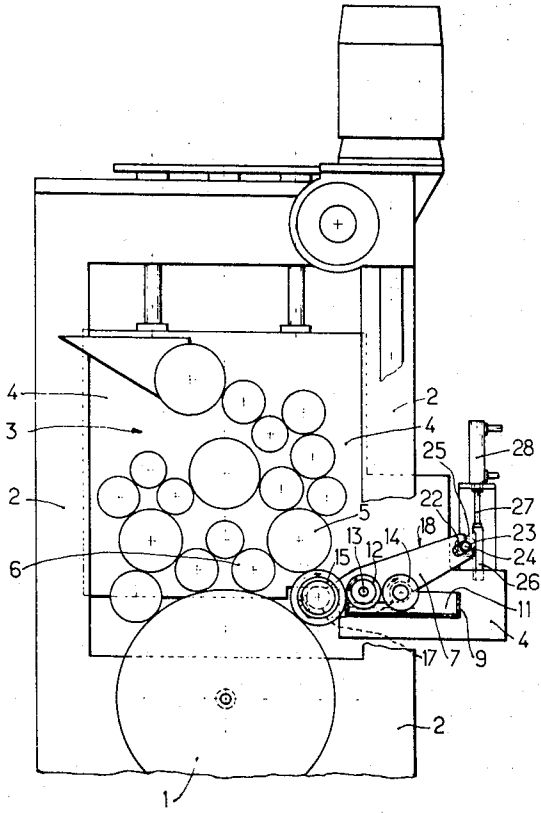
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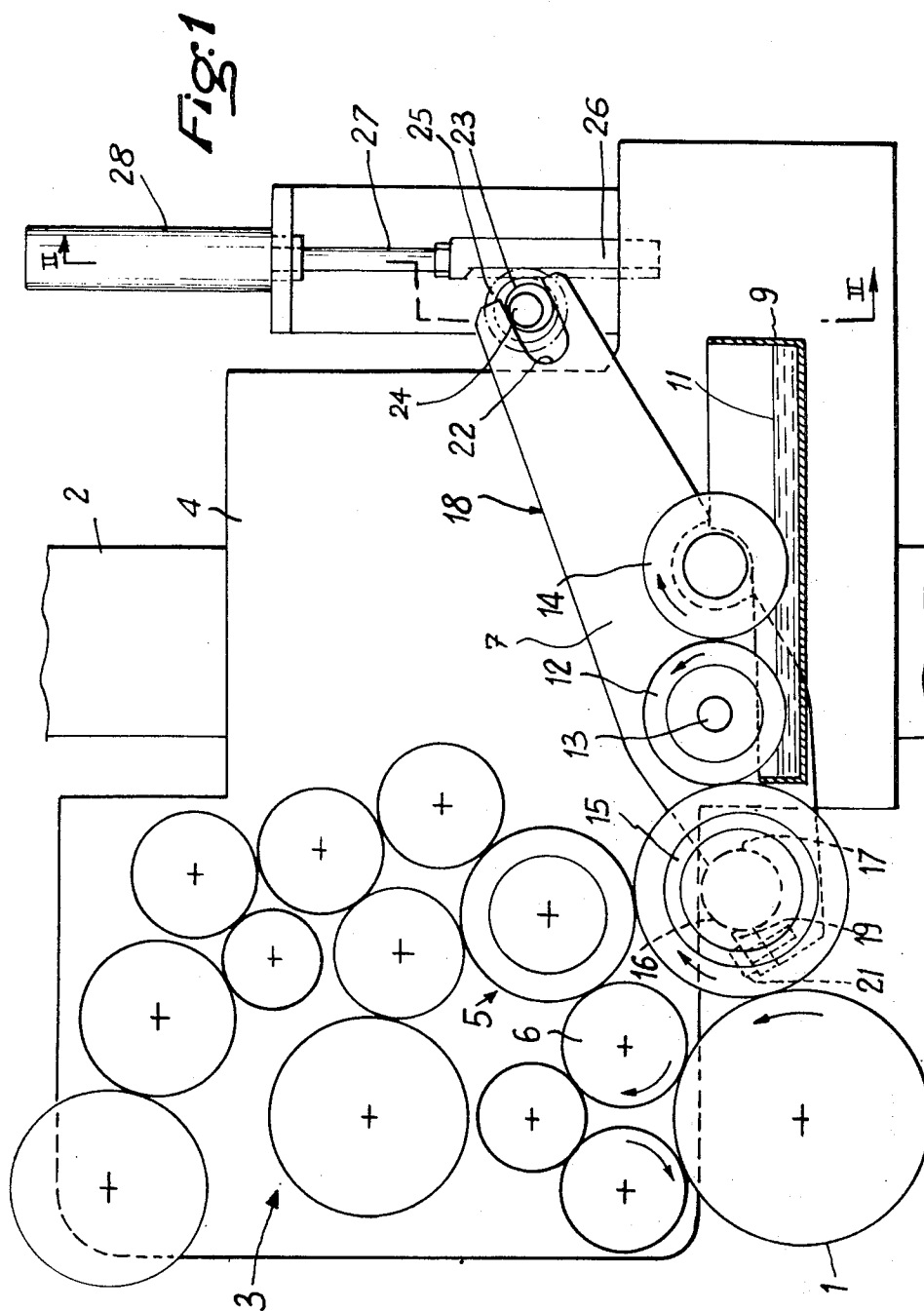
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[57] **ABSTRACT**  
A damping device for a rotary offset printing machine comprises a damping or transfer roller which is immersed in a trough of damping medium and runs in contact with a drying means and a form roller contacting the plate cylinder. The damping device and the inking system of the press are mounted on a frame which is raised at the termination of operation to disengage the form roller and the inking rollers from the plate cylinder. The form roller is additionally carried on support arms which can be lowered to re-engage the form roller with the plate cylinder so as to initiate washing thereof.

7 Claims, 6 Drawing Figures





*Fig. 2*

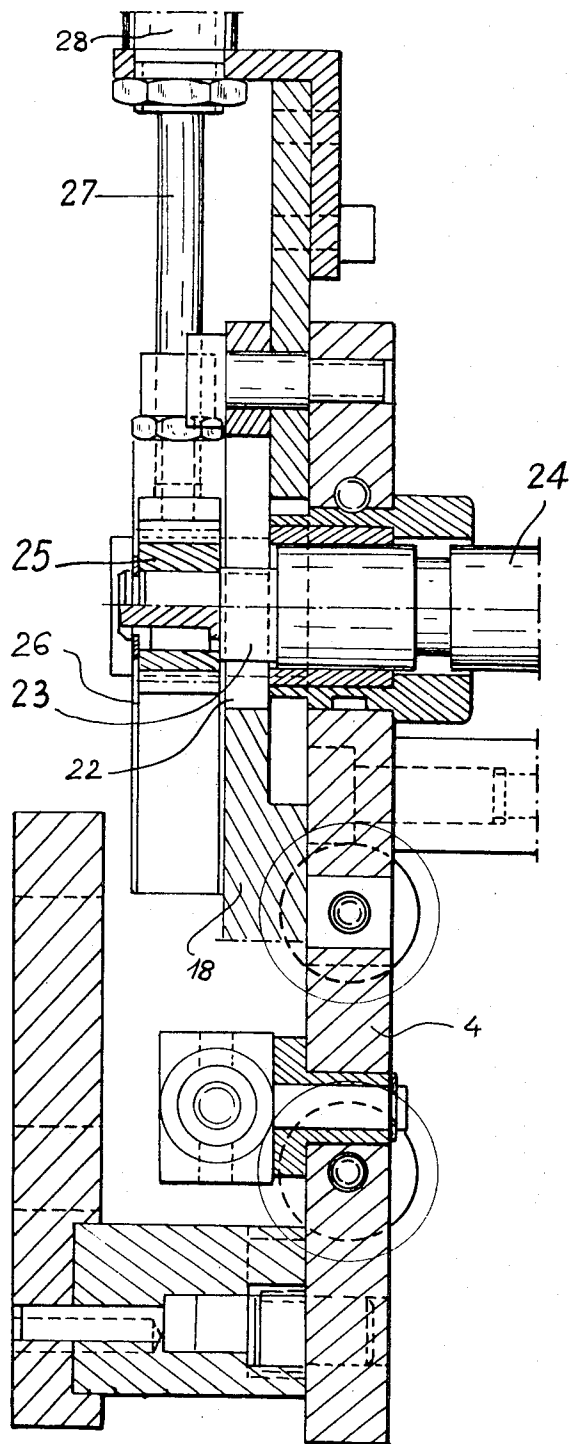


FIG. 3

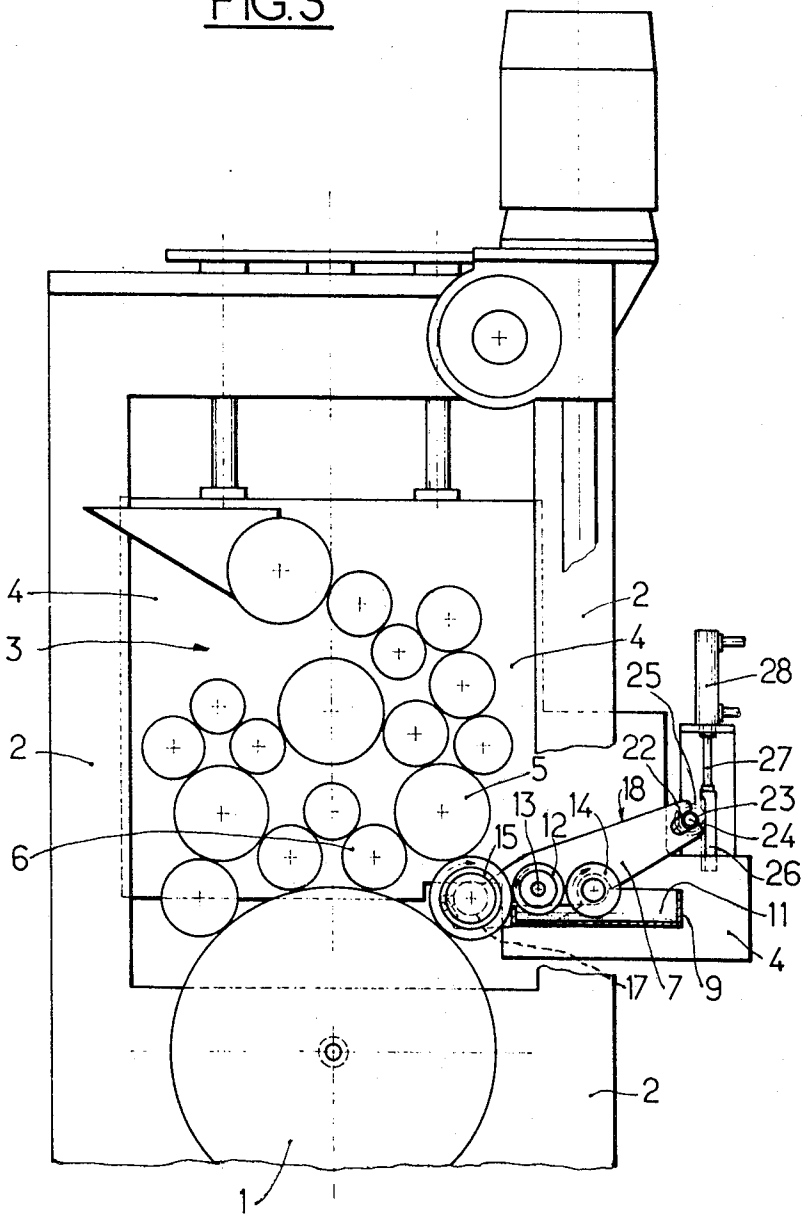


FIG.4

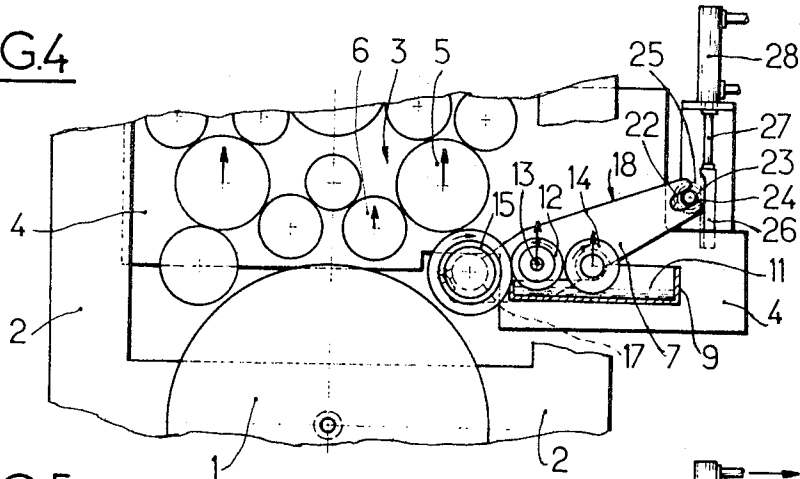


FIG.5

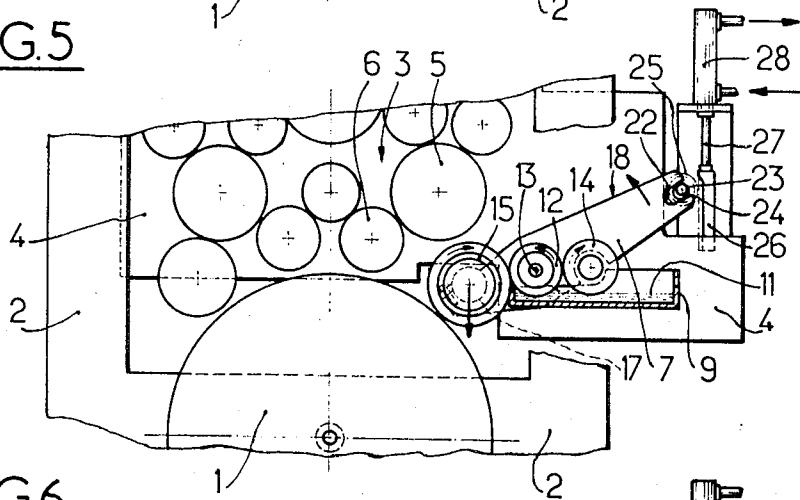
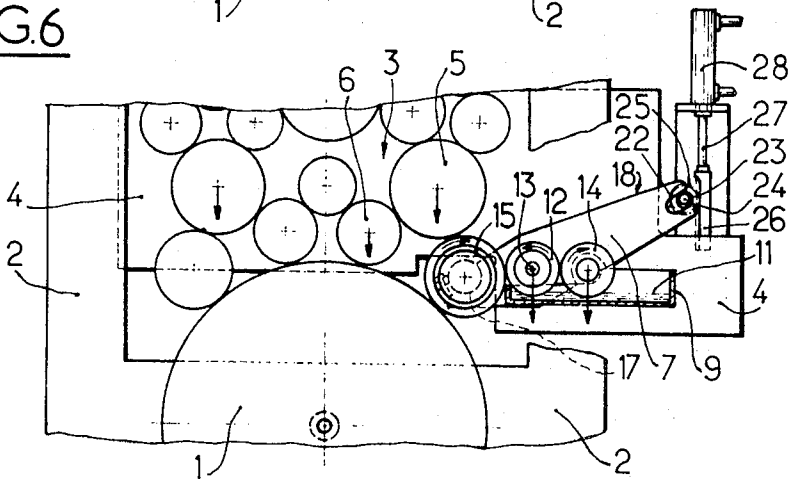


FIG.6



# DAMPING DEVICE FOR ROTARY OFFSET PRINTING MACHINE

## BACKGROUND OF THE INVENTION

Before an offset press can be put into operation after having been out of use for a period of time, the plate cylinder must first of all be washed to remove therefrom the coating of protective solution which is normally applied to protect the plate cylinder against oxidation. Up to the present this operation has been carried out manually by wiping it with a sponge saturated with water, an operation which is time-consuming and also inconvenient.

## SUMMARY OF THE INVENTION

It is a general object of this invention to provide means whereby the plate cylinder can be copiously washed and totally wetted before printing recommences.

It is a further object of this invention to adapt a damping device which is used during printing to dampen the plate cylinder to the task of washing the cylinder before recommencement of printing.

Accordingly, a damping device for the plate cylinder of an offset rotary press comprises a trough containing a damping medium, a damping or transfer roller having a surface of a hard hydrophilic material and immersed by its lower part in the medium and in contact with a drying device, a form roller having a surface layer of supple material and tangential both to the transfer roller and to the plate cylinder, the damping device being mounted on a frame movable vertically on the frame of the machine, said frame also bearing an inking device comprising inking rollers tangential to the form roller the device being characterised by the fact that the shaft of the form roller is borne by two parallel lateral levers pivotally mounted on the shaft of the transfer roller, and that means are provided for the control of the pivoting movement of the two levers when the inking device is displaced into its upper position, i.e., occupies the pressure release position, in such a way as to move the form roller downwards so that the said roller by itself comes in contact with the plate cylinder in order to effect the ample washing of this latter before the inking operation.

## DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic vertical and longitudinal sectional diagram of a damping and inking device for an offset rotary press,

FIG. 2 is a partial cross section, on a larger scale, along the line II—II of FIG. 1;

FIG. 3 is a side view, partly in section, of the overall apparatus, and FIGS. 4-6 are fragmentary side views, partly in section, showing various working stages of the apparatus.

## DESCRIPTION OF PREFERRED EMBODIMENT

The offset rotary press, of which a partial schematic diagram is shown in FIG. 1, comprises a plate or engraved cylinder 1 mounted to rotate about a horizontal axis in a fixed vertical frame 2. The printing machine also comprises a conventional inking device 3, consisting of a plurality of inking rollers and drums rotatably mounted on a frame 4 which is movable vertically on the fixed frame 2. The inking rollers are tangential to one another, in order to convey the ink to the plate cyl-

inder 1. The inking device 3 comprises, in particular, a roll termed an inking drum or ink table 5 having a surface made of a hard material and tangential to an inking roller 6 in contact with the cylinder 1.

The rotary press also comprises a damping device indicated generally at 7 and consisting essentially of a trough 9 containing a damping medium 11, usually water, which is continuously pumped in a closed circuit in order to filter it. The lower part of a damping or transfer roller 12, with a hard surface layer of hydrophilic material such as chromium, is immersed in the damping medium 11. This roller 12 is drivable in a counterclockwise direction on a horizontal and transversely extending shaft 13 by means of a motor and a gear train not shown in the drawing. The right-hand part of the roller 12 is in contact with a metering or squeeze roller 14 which is kept motionless or caused to rotate in a clockwise direction at a very low speed, between one tenth and one hundredth of the speed of rotation of the roller 12 and presses against the roller 12 to squeeze excess damping medium therefrom.

The left-hand part of the roller 12 is tangential to a form roller 15 having a surface layer of supple or flexible resilient material and itself tangential both to the plate cylinder 1 and to the ink table 5, when the inking device is in its lower or "pressure applied" position, i.e., that in which the inking and form rollers are applied under pressure to the plate cylinder 1.

When the printing press is in operation, the peripheral surface of the form roller 15 is thus fed with ink by the ink table 5 and with water by the roller 12, the form roller depositing the mixture of ink and water on the surface of the plate cylinder 1.

In accordance with the invention, the shaft 16 of the form roller 15 is mounted in such a way as to rotate in two cradles 17 provided on the left-hand ends of two lateral and longitudinal levers 18. The shaft 16 is held in the cradles 17 by wedges 19 fixed in position by means of screws 21.

The two levers 18 are mounted pivotally on the shaft 13 of the roller 12. Each pivotal lever 18 has a bifurcated right-hand end forming a central notch 22 accommodating a cam 23. The latter is integral with a transversely extending shaft 24 of which the end is integral with a pinion 25. The pinion 25 meshes with a vertical rack 26 integral with the piston rod 27 of a hydraulic cylinder 28 disposed with its longitudinal axis extending in a vertical direction. The device described above operates as follows:

when the offset printing press comes to a stop, the frame 4 bearing the inking device 3 and the damping device 7 is moved upwards in order to separate the inking rollers such as 6 and the form roller 15 from the plate cylinder 1.

When a further printing operation must take place, the plate cylinder has to be copiously washed before being re-inked. For this purpose, the hydraulic cylinder 28 is actuated such as to cause its piston rod 27 and the rack 26 to slide vertically. Such displacement of the rack causes the pinion 25 to rotate, which rotation is transmitted to the shaft 24 and to the two cams 23. The rotation of the cams 23 in the notches 22 of the two levers 18 results in counterclockwise pivotal movement of the levers 18 about the shaft 13. The form roller 15 is thereby moved downwards and thus away from the ink table 5, which is held in the higher or "pressure release" position by the frame 4. The form roller engages

the peripheral surface of the plate cylinder 1, the two inking rollers 6 being kept at a distance from the cylinder 1. Furthermore, in the course of the pivoting movement of the two levers 18 about the shaft 13, the form roller 15 remains in continuous contact with the roller 12.

The roller 12 supplies the periphery of the form roller 15 with a film or water, which is then transferred by this latter roller to the plate cylinder 1, whereby the latter is copiously washed for a period of time decided by the machine operator.

When the operator considers that the cylinder has been washed sufficiently, he causes the movable frame 4, bearing the inking device 3 and the damping device 7, to move downwards, the feed movement imparted to the cylinder 28 being reversed at the same time. As the form roller 15 is still in contact with the plate cylinder 1 and with the roller 12, the descent of the swivel shaft 13, itself brought about by the downward movement of the frame 4, takes effect in a pivotal movement of the two levers 18 relative to the frame 4. At the end of the descent of the frame 4, the two inking rollers 6 come in contact with the periphery of the plate cylinder 1, and the ink table 5 comes in contact with the form roller 15; the printing process can then take place in the normal manner.

FIG. 4 depicts the nonprinting stage wherein the inking rollers 6 and the form roller 15 are disengaged from the plate cylinder 1 and the movable frame 4 is in its upper position. FIG. 5 shows the movable frame 4 in its upper position and shows the levers 18 pivoted in a counterclockwise direction by the actuator 28 so that the form roller 15 engages with the plate cylinder 1 and this corresponds to the washing stage. FIG. 6 shows the printing stage wherein the movable frame 4 is in its lower position thereby moving the inking rollers 6 into contact with the plate cylinder 1 and moving the inking drum 5 into contact with the form roller 15. It should be noted that during the downward movement of the frame 4, the levers 18 are automatically pivoted to their initial position shown in FIG. 4 since the form roller 15 is in engagement with the plate cylinder 1 and thus downward movement of the frame effects pivotal movement of the levers.

It is to be understood that the embodiment described above is offered purely by way of example and may be modified in many ways within the spirit and scope of the invention. Thus, for example, intermediate rollers may be interposed between the form and transfer rollers and the form roller may pivot about the axis of such an intermediate roller so as to maintain contact therewith. Instead of pivoting on the shaft 13, the levers 18 may pivot on fixed stub members co-axial therewith. Also, the lever may be in the form of a fork, the limbs of which pivot on the shaft while the single body part of which is formed with slot 22.

What I claim is:

1. In an offset rotary press having a fixed frame and a rotary plate cylinder rotatably mounted on said fixed frame: a second frame movable vertically between an upper and a lower position on said fixed frame; an inking device carried by said second frame, said inking device comprising inking rollers contacting said plate cylinder in the lower position of said second frame and being disengaged from said plate cylinder in the upper position of said second frame, and an inking drum in contact with one of said inking rollers; a damping de-

vice carried by said second frame, said damping device comprising a trough containing a damping medium, a transfer roller disposed at least partially in said trough and having a surface composed of hard hydrophilic material, metering means contacting said transfer roller, a form roller adapted to receive damping medium from said transfer roller and having a surface of resilient material and being tangential to both said plate cylinder and inking drum in the lower position of said second frame and disengaged from said plate cylinder in the upper position of said second frame; means mounting said form roller for pivotal movement into contact with said plate cylinder and out of contact with said inking drum when said second frame is in said upper position; and means for effecting said pivotal movement of the form roller; whereby damping medium may be transferred from said trough to said plate cylinder to wash the same.

2. A press as claimed in claim 1, wherein said means mounting said form roller comprises two parallel levers pivotal about an axis coincident with the axis of said transfer roller, and wherein said form roller makes continuous contact with said transfer roller.

3. A press as claimed in claim 2, wherein said means for effecting said pivotal movement of said form roller comprises a piston and cylinder mechanism mounted on said movable frame, a rack actuated by said mechanism, a pinion engaging said rack, means defining a notch provided in each of said two pivotal levers, and two cams integral with said pinion and each accommodated in one of said notches.

4. In a printing apparatus having a rotary plate cylinder; a movable frame movable relative to said plate cylinder to a printing position and a nonprinting position; inking means mounted on said frame for applying ink to said plate cylinder when said frame is in said printing position, said inking means including an inking drum rotatably mounted on said frame, and an inking roller rotatably mounted on said frame in continuous line contact with said inking drum and in line contact with said plate cylinder when said frame is in said printing position and out of contact with said plate cylinder when said frame is in said nonprinting position; damping means mounted on said frame operable in a damping mode for applying a damping medium to said plate cylinder to wet same when said frame is in said printing position and operable in a washing mode for applying damping medium to said plate cylinder to wash same when said frame is in said nonprinting position, said damping means including a transfer roller rotatably mounted on said frame receptive of the damping medium for transferring same to another location, a rotary form roller in continuous line contact with said transfer roller to receive therefrom the damping medium, and mounting means mounting said form roller on said frame for pivotal movement between one position and another position wherein in said one position said form roller makes either line contact with both said inking drum and said transfer roller but not said plate cylinder when said frame is in said nonprinting position or makes simultaneous line contact with all of said inking drum, plate cylinder and transfer roller when said frame is in said printing position and wherein in said another position said form roller makes line contact with both said plate cylinder and said transfer roller but not said inking drum when said frame is in said nonprinting position.

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5. A printing apparatus according to claim 4; wherein said mounting means includes means mounting said form roller for pivotal movement about the rotary axis of said transfer roller thereby maintaining the two rollers in continuous line contact regardless of the position of said frame or the pivotal position of said form roller.

6. A printing apparatus according to claim 5; wherein said mounting means includes a pair of elongated levers

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each pivotally connected at one end to said form roller and each mounted for pivotal movement about said rotary axis.

7. A printing apparatus according to claim 6; including a fluid actuator pivotally connected to the other end of each said lever and operative to selectively pivot said pair of levers about said rotary axis.

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