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G. KALDSCHMIDT ET AL

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PRESSURE MEANS FOR ROTARY PRINTING PRESSES

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2 Sheets-Sheet 2

FIG. 2

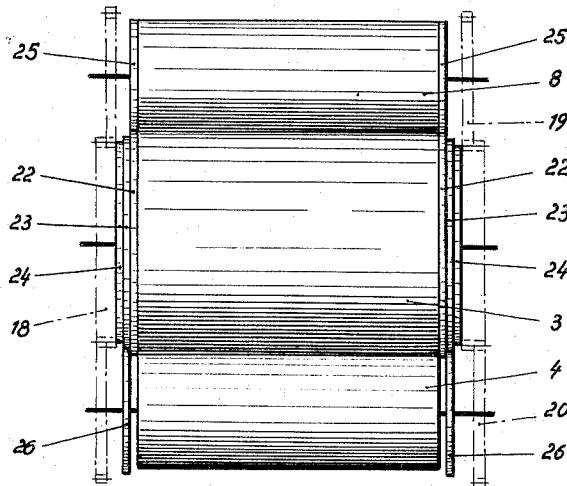


FIG. 4

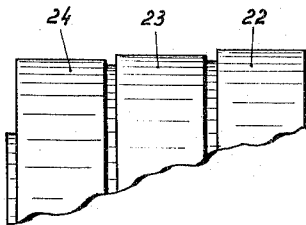
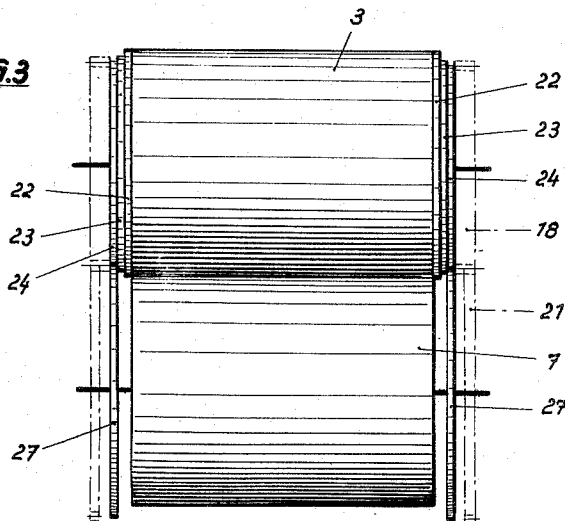


FIG. 3



INVENTORS
Georg KALDSCHMIDT and
Walter HEINEMANN
BY *J. H. Finz*
Attorney

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PRESSURE MEANS FOR ROTARY PRINTING PRESSES

Georg Kaldschmidt, Dresden-Weisser Hirsch, and Walter Heinemann, Werder (Havel), Germany, assignors to VEB Druckmaschinenwerk Victoria, Heidenau, Saxony, Germany

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1 Claim. (Cl. 101—216)

This invention relates to a printing press particularly designed for printing bank notes, bonds, stamps and the like and simultaneously bringing out portions of the work in relief.

Presses of this class produce impressions that are difficult to imitate by using straight or curved intagliated plates and applying high contact pressures. The plates are inked over their entire surface and then wiped in such manner that the ink remains only in the depressions thereof and is taken up by the paper. The paper employed in this process is usually wetted to enable it to completely draw out the ink from these cavities. When bank notes and the like are printed, they are provided on dry sheets with a ground tint or background as protection against counterfeiting, but it is extremely difficult to effect perfect register of the wet and dry sheets. Attempts have been made of course to overcome these troubles, and one of the proposals to this effect consists in equalizing the lengths of the dry paper used in letterpress printing, which is part of the process, and of the wetted sheets required in printing from intagliated plates, which forms also part of the process, by making the printing dimensions for letterpress printing somewhat smaller than those for the other operation. Experience has shown, however, that the differences in register, which encourage counterfeiting, cannot be eliminated in this way.

The invention proposes to exclude these serious disadvantages by combining in one press a printing unit operating with intagliated plates and a second unit working on the letterpress or another principle and having both units cooperate with a single impression cylinder, making ready of the letterpress or other unit being effected from below. As the contact pressures for the different printing processes differ and therefore also the deformations of the packings, simple circular rings or races of different diameters are centrically secured on both sides of the impression cylinder fitted with an elastic packing. These rings cooperate with corresponding rings or races on the background cylinder, plate cylinder carrying an engraved plate and the numbering letterpress cylinder, and these rings operate on a single impression cylinder to insure accuracy of register. For drying the ground tint infrared and ultraviolet radiators or an air blast is used. Any traces of letterpress ink on the intagliated plate are removed by suitable wipers prior to the proper inking of this plate with copperplate printing ink.

The printing press suggested differs from the known presses in this field also in its capacity to produce multicolored impressions in operating direction. For this purpose, ink is taken up from two or more fountains by inking cylinders whose circumference divides integrally or without remainder into the circumference of the plate cylinder, so that any point of an inking cylinder always contacts with the same point of the plate cylinder. The surface of the inking cylinders is recessed according to the intended color effect of the prints. The ink of the

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different inking cylinders is gathered on a collecting roller and transferred to the engraved plate, and after wiping multicolored impressions will be obtained. This arrangement affords the additional and considerable advantage that the ink is not applied to the entire surface of the engraved plate as at present, but only to those portions thereof from which impressions are to be taken, which involves not only a saving in ink but permits also operation of the press at less wiper feed. The wiper arrangement is of the conventional type. Instead of combining steel plate printing with the letterpress process other processes may be united therewith.

One embodiment of the invention is illustrated in the accompanying drawing, wherein

Figure 1 is a diagrammatic view of the printing press according to the invention;

Fig. 2, a radial view of the numbering and ground tint cylinders cooperating with the impression cylinder;

Fig. 3, a radial view of the plate cylinder cooperating with the impression cylinder; and

Fig. 4, a partial view on an enlarged scale of the rings arranged on the impression cylinder.

As shown in Fig. 1, the wetted sheets 1 are arranged in a pile in the press frame. From this pile a sheet is picked up by a feeding device, passed to the gauge-pins, aligned and transferred to the impression cylinder 3 by preliminary grippers 2. Below the impression cylinder 3 and axially parallel thereto a ground tint cylinder 4 is disposed for which an inking apparatus 5 is provided. In the direction of motion of the impression cylinder 3 and behind the line of contact with the background cylinder 4 a drying arrangement 6 is positioned which may comprise infrared and ultraviolet radiators and a dry air blast. With the impression cylinder 3 cooperate the plate cylinder 7 and the numbering letterpress cylinder 8 arranged diametrically opposite the background cylinder 4. 9 signifies the stack of printed sheets. A wiper roller 10 cooperates with the plate cylinder 7. 11 and 12 denote ink fountains cooperating with the color scheme cylinders 13, 14 which are in contact with the collecting cylinder 15 adjacent the plate cylinder 7. The latter is provided also with a jogger 16 and wiping means 17.

The impression cylinder 3, as shown in Figs. 2-4, is positively connected with the numbering cylinder 8, the background cylinder 4 and the plate cylinder 7 by gear wheels 18, 19, 20 and 21 and is provided on each side with three rings 22, 23, 24 which differ in diameter. These rings 22, 23, 24 cooperate with corresponding rings 25 one of which is arranged on each side of the numbering letterpress cylinder 8, rings or races 26, one on each side, of the background cylinder 4 and races 27, one on each side, of the plate cylinder 7, the races 22 of largest diameter of the impression cylinder cooperating with the races 25, the races 23 of medium diameter with races 26 and races 27 with races 24 of smallest diameter to vary, owing to their difference in diameter, the contact pressures exerted by the cylinders according to the requirements of the different printing processes.

The mode of operation is as follows:

The wetted sheets 1 are conveyed by a feeding means to the preliminary gripper 2 and taken over by the impression cylinder 3 which moves them past the background cylinder 4 the plates of which are inked by the inking mechanism 5. On their farther travel the sheets are subjected to a drying process by means of the device 6 comprising infrared and ultraviolet radiators and a dry air blast to intensify the drying of the rapidly drying background tint.

The sheet receives an impression from an engraved plate by coming in contact with the plate cylinder 7 and is provided with a numerical or other desired impression

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by contact with the letterpress cylinder 8. By means of a delivery means of the tape type the sheet is then placed on the stack 9 with the printed side up. From the plates on the cylinder 7 any traces of ground tint ink are removed by the wiper roller 10. The two ink fountains 11 and 12 transfer ink to the inking cylinders 13 and 14 which take up ink only at the points corresponding to the colored portions of the impression. The ink of the two cylinders 13, 14 is applied to the collecting cylinder 15 and supplied to the engraved plates arranged on the plate cylinder 7, the jogger 16 operating to fill the depressions in the plates with ink. Ink found outside these depressions is removed by the wiper arrangement 17, so that the engraved plates can finally make impressions on contacting with the impression cylinder 3.

Owing to the different diameters of the rings 22—27 provided on the cylinders, the compressive force of the latter varies as required.

We claim:

In a printing press particularly designed for printing bank notes and securities by applying different printing processes in a single operation, the combination of a background cylinder, a plate cylinder carrying an intagliated plate, a numbering letterpress cylinder and a single cooperating impression cylinder operated on by the first-mentioned three cylinders under different contact pressures according to the different printing processes, means

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for establishing separate contact pressures for each of the background, plate and numbering cylinders, said means comprising pairs of circular rings, one ring of each pair mounted on each side of the impression cylinder and concentric therewith, each of said pairs of rings differing in diameter, a pair of rings provided on each of the background, plate, and numbering cylinders, each pair cooperating with one of the pairs of rings on the impression cylinder, and the various pairs of corresponding cooperating rings being of such diameters as to establish a predetermined printing pressure for each of the cylinders.

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