Feb. 14, 1956 B. L. RAUSCH 2,734,452

METHOD OF RELIEF OR EMBOSSED PRINTING

Filed Oct. 2, 1952 2 Sheets-Sheet 1

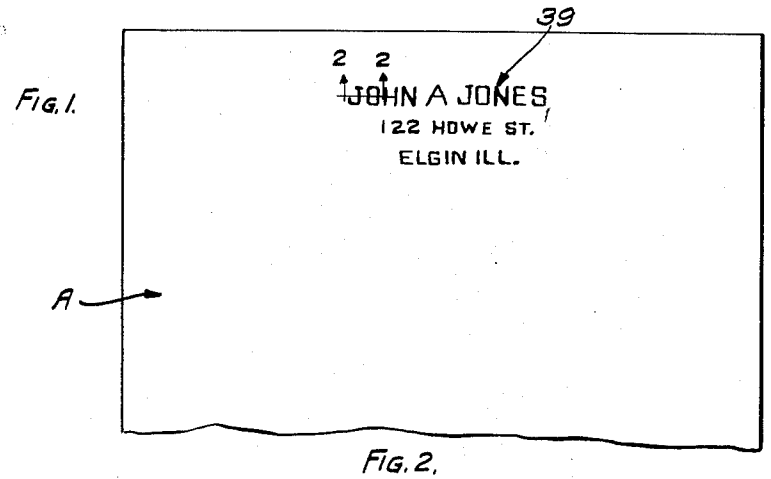


FIG. 1.

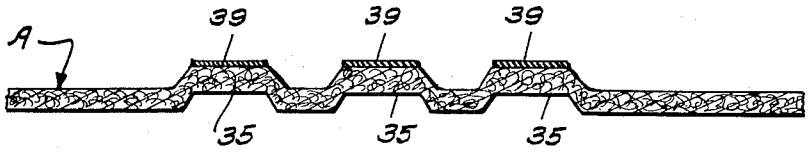


FIG. 2.

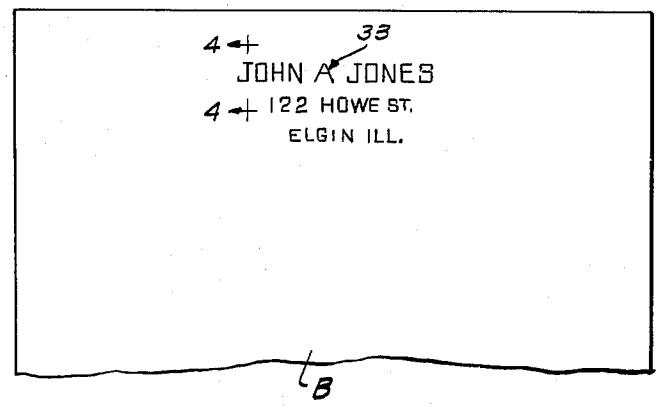


FIG. 3.

FIG. 6.

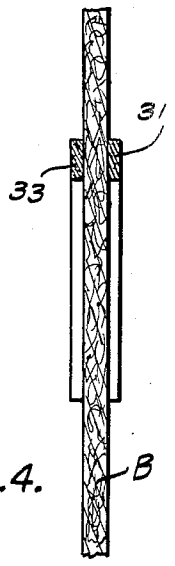
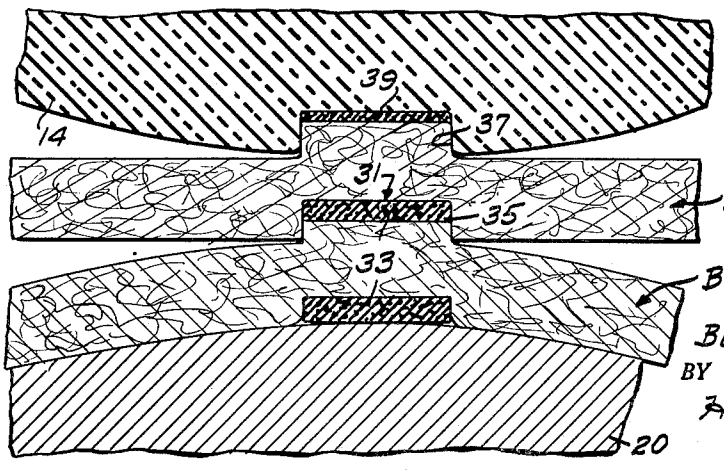


FIG. 4.



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METHOD OF RELIEF OR EMBOSSED PRINTING

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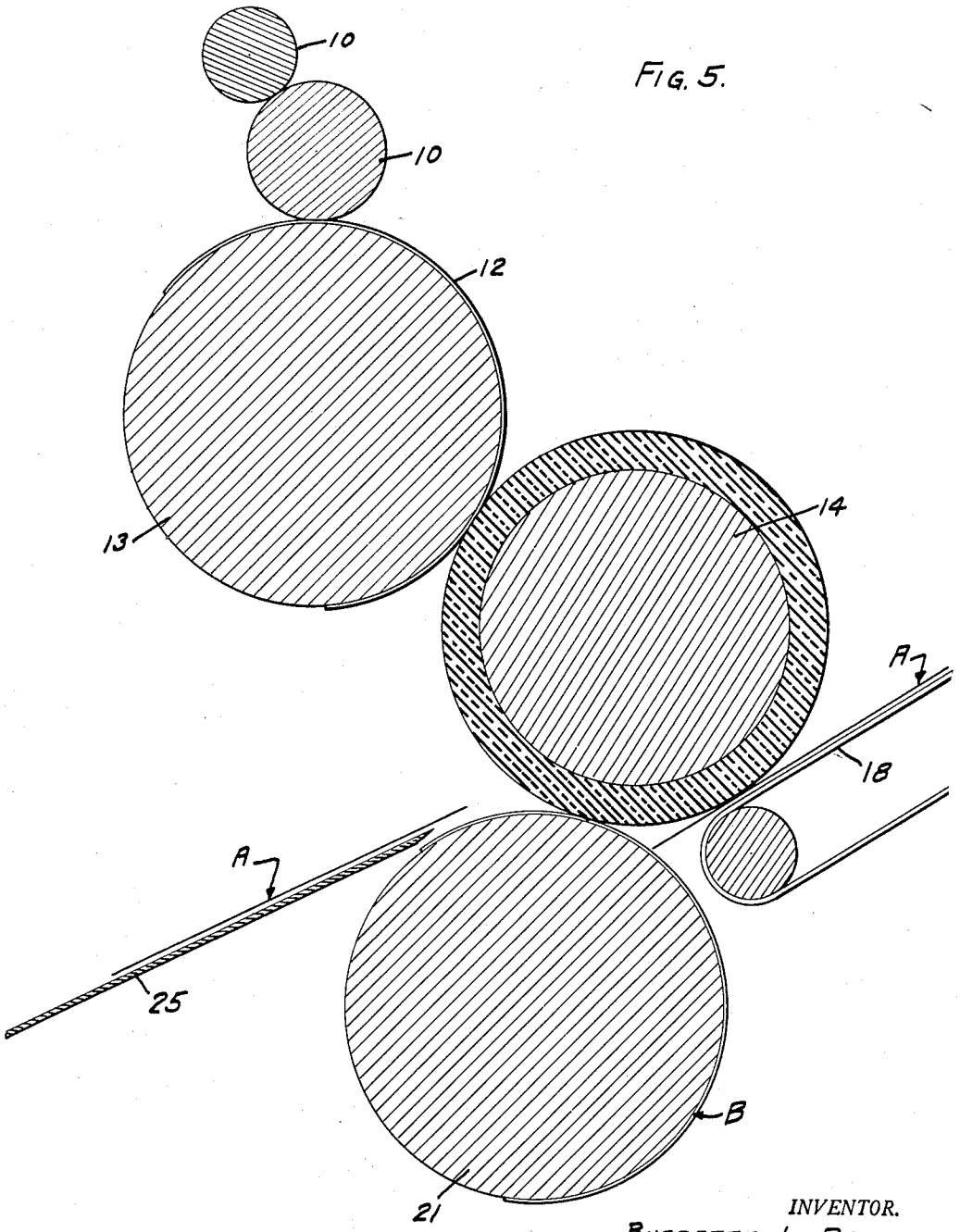


FIG. 5.

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METHOD OF RELIEF OR EMBOSSED PRINTING

Burdette L. Rausch, Elgin, Ill.

Application October 2, 1952, Serial No. 312,687

1 Claim. (Cl. 101—32)

My invention relates to an improved method of printing.

My invention relates more particularly to an improved method of relief or embossed printing to simulate engraving.

In the production of embossed printing, the printer usually employs male and female dies which are prepared in advance by engraving, etching or by some other hand or mechanical process. This is far more expensive than ordinary printing and is frequently prohibitive because of its high cost.

The principal object of the present invention is to provide an improved method or process of printing which simulates engraving.

A further object of the invention is to provide an improved process of relief or embossed printing whereby the depth of the embossing or relief may be determined in advance by the printer and printing accomplished according to such determination.

A further object of my invention is the provision of an improved method of embossed printing wherein both the printing and the embossing are accomplished in a single operation and without the use of expensive male and female die parts.

For a more comprehensive understanding of the invention and the manner of carrying out the same, reference is had to the accompanying drawings wherein the practice of my improved method is illustrated.

In the drawings,

Fig. 1 is a front view of a portion of a sheet of paper embossed and printed by my improved process;

Fig. 2 is a greatly enlarged cross-sectional view therethrough taken on line 2—2 of Fig. 1 and showing the ink deposits on the surface of the paper, and also the depressions on the back surface of the paper to simulate engraving;

Fig. 3 is a front view of a sheet of paper which has been treated to have raised letters thereon on both sides and then used as a male die member in carrying out my process.

Fig. 4 is a greatly enlarged cross-sectional view thereof taken on the line 4—4 showing the registering letters on both surfaces of the sheet of paper;

Fig. 5 is a generally diagrammatic view of an offset printing press embodying the features of my invention; and

Fig. 6 is a greatly enlarged fragmentary view showing the actual printing and embossing operation.

In offset printing such as is illustrated herein, the transfer sheet 12 containing the desired copy is prepared and fastened on the plate roll 13. Ink is obtained from the inking rolls 10 and the copy is transferred to the surface of the rubber blanket on the blanket cylinder 14. Sheets A to be printed are fed down the sheet feed conveyor 18 between the blanket cylinder 14 and the solid impression roll 21. The ink on the blanket cylinder 14 is transferred to the surface of sheet A and it is passed to the delivery platform 25.

This is the usual method of offset printing. However, to carry out my improved process, I fasten a treated sheet B to the solid impression roll 21 for a purpose which will hereinafter be apparent.

The treated sheet B is preferably made from the transfer sheet 12 containing the desired copy and may be made in the following manner. After the ink impression has been built up on the rubber blanket and on the transfer sheet 12, a thin sheet of paper 20 is rolled between the two inked images, that is, between the rollers 13 and 14, so that an impression in register on both sides of the paper may be obtained. This results in the image on the back of the sheet being in reverse in exact register with the image on the front of the same.

While the ink of the imprints on both sides of the sheet B is still wet or moist, the same are powdered with an adhering rosin powder or similar material adapted to fuse and set under the application of heat. The application of heat causes the melting of the resinous compound, the particles become fused together on the ink, harden, and produce generally a "raised" effect, such as shown at 31 and 33 in the enlarged cross-section of sheet B. This is commonly known today as the art of raised printing or thermography.

After the sheet B has been treated in the manner described, it is attached by a suitable adhesive or other attachment to the surface of the solid impression roll 21 in register with the transfer sheet 12 on the plate roll 13.

Referring now to Fig. 6, the action of the treated sheet B in the printing process will be more clearly explained.

As sheet A, to be printed, is fed through the press, it passes between blanket cylinder 14 carrying the ink for the impression and the solid impression roller 21. Roller 21, however, has the previously treated sheet B with the raised letters 31, 33, on both sides fastened to its surface in such a way that the raised letters are in register with the ink impression on the blanket cylinder 14. Thus, as can be seen, when the printing operation takes place, the thickness of the raised letters 31, 33 will press into the lower surface of the sheet 16 to the depth of the thicknesses, creating a cavity or depression 35. This causes a raised portion or platform 37 which presses into the yielding rubber blanket and picks up the printing ink impression 39 on the surface of the raised portion or platform 37.

Thus, by this process, printing and embossing are simultaneously accomplished and the mechanism for effecting the result requires only the addition to usual printing equipment of the treated sheet B. Where deeper embossing is desired, two or more treated sheets may be fastened in register on the impression roll.

Since the ink transfer blanket is yieldable, the number of impressions which may be obtained from a treated sheet or sheets is considerable. At present, a normal run is over 10,000 impressions; however, the density of the "set" ink on the treated sheet and the resiliency or spring of the rubber blanket of the blanket cylinder are all factors which contribute both to the quality of the embossing and the printing.

From the above and foregoing, it can be seen that my process is easily followed, and with only the preparation of a sheet of paper having "raised" printing, or thermographically treated, the process can be carried out by easily fastening the treated sheet in register on the impression roll.

While the process has been described with particular reference to and applied to offset printing operation, it is clear that the process need not be limited to offset press production. In effect, the treated sheet which I employ acts as a male die and against any compressible

member such as the blanket cylinder of the offset press the process can be effectively used.

I contemplate that changes and modifications may be made in the exact details of the method shown, and I do not wish to be limited in any particular; rather what I desire to secure and protect by Letters Patent of the United States is:

A process of printing and embossing with offset printing equipment which consists of attaching a transfer sheet containing the desired copy to a plate roll, applying ink thereto to transfer the copy to a resilient blanket cylinder transferring the ink to the surface of a hard impression roll, again applying ink to the plate roll and transferring the ink design to the surface of the blanket cylinder, passing a sheet of paper between the ink blanket cylinder and the impression roll to make a printed copy on both sides of the sheet of paper, the one side being a reverse print in register with the transfer print on the opposite side, and raising the copy thereon by a thermography process, fastening this treated sheet of paper on the solid impression roll in contact with and below said blanket cylinder with the raised copy portions on the sheet in exact register with the ink design portions of the resilient blanket cylinder as determined by the ink deposited thereon from the plate roll and then running blank sheets to be printed and embossed between the blanket cylinder and the impression roll with the raised printing on the treated sheet in register with the copy on the transfer sheet.

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