Nov. 25, 1941. L. SCHULMAN 2,263,893

EMBOSSING AND PRINTING MACHINE

Filed Oct. 23, 1939

Fig. 1

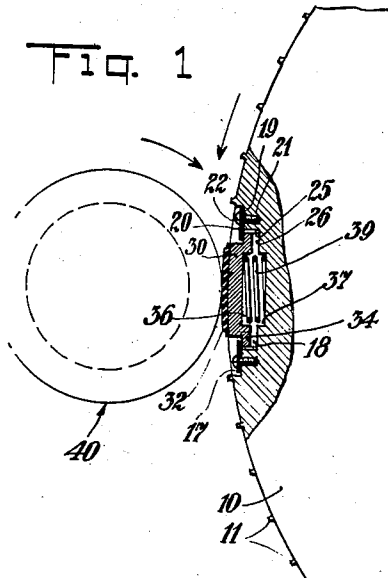


Fig. 2

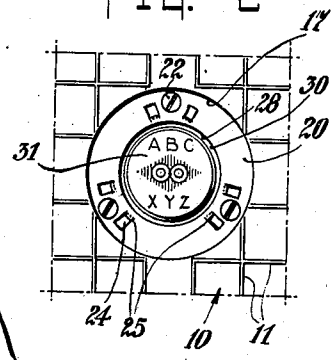
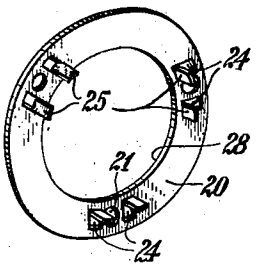


Fig. 3



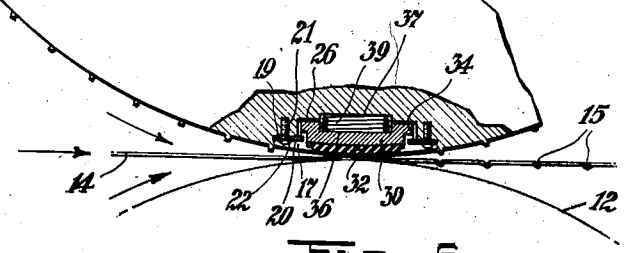


Fig. 6

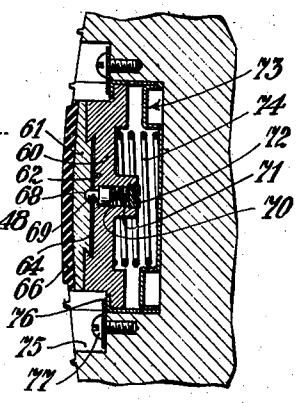


Fig. 4

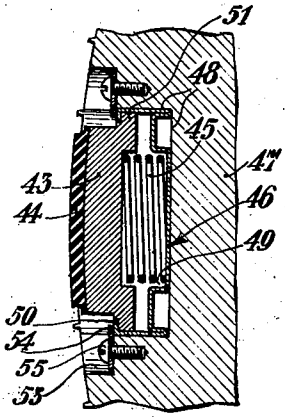
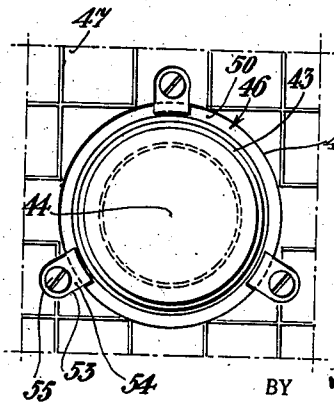


Fig. 5



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UNITED STATES PATENT OFFICE

2,263,893

EMBOSSING AND PRINTING MACHINE

Louis Schulman, New York, N. Y.

Application October 23, 1939, Serial No. 300,728

2 Claims. (Cl. 101—23)

This invention relates to the embossing and printing arts and relates more particularly to an improved method and apparatus for producing embossed paper of the so-called "trade-mark" type, that is, ornamented paper for wrapping and other purposes wherein the trade-mark or name of the producer or distributor of a wrapped product appears in uniformly spaced areas thereon.

The application constitutes a continuation-in-part of my co-pending application Serial No. 292,914, which discloses a method and apparatus for producing ornamented paper of this general type. The apparatus described in said application included an embossing roller having a plurality of uniformly spaced areas free from embossing and a pair of printing rollers positioned adjacent thereto and adapted to print the trade-mark or other special indicia in such areas, means being provided for insuring relatively perfect register of the special indicia within such areas.

In the present invention the printing rollers are dispensed with entirely and the steel embossing roller, which may have any suitable design engraved thereon is formed, with a plurality of spaced recesses of suitable depth, which recesses may be round, square, diamond shaped or otherwise. Within each recess is secured a special printing attachment for printing the trade-mark or other special indicia. The particular difficulty involved in such an arrangement is in providing means for preventing the type plate from being crushed by the embossing rollers which, as is well known in the art, engage each other under extremely high pressure in order to secure a deep, clean embossing. In other words, if the surface of the printing plate is properly positioned relative to the surface of the steel embossing roller, in order to make a clean printing impression, such type will in all events receive too much pressure from the power or paper roller and the type will be destroyed after a relatively small number of impressions.

Accordingly, one of the principal objects of the present invention is the provision of a yieldable or resilient mounting for the printing type, such type lying on a plane relative to the periphery of the steel embossing roller, carrying such type and mounting therefor in the aforesaid recesses, as to be readily inked by an inking roller and also be sufficiently yieldable when passing through the embossing rollers as to make the desired impression and not be crushed.

It is common practice in the paper embossing art to ink the high spots on the embossing roller which in turn deposits the ink in the depressed portions of the paper, thus both embossing and printing the design. In accordance with the present invention, the inking roller may deposit ink on both the high spots of the embossing roller and also in type. In this manner the ink embossing and the printing of the special indicia is done in one color, thus giving the latter the appearance of embossing.

It will accordingly be apparent that a set of the printing attachments may be secured within the recesses and a run of the embossed paper made, the paper thus having a particular trade-mark, and at the end of the run the printing attachments may be removed and another set carrying a different trade-mark being inserted for another run. It will be obvious that a single embossing roller, which is relatively expensive, may be used for any number of runs of individual trade-mark paper and that only the type need be changed and in this connection means are provided for changing the type alone or for removing the type and yieldable support therefor. Means are also provided for causing the type plate to normally lie on a plane beyond the periphery of the steel embossing roller in cases wherein ink embossing is not desired and in these instances the ink roller engages only the type and not the embossing roller.

In the drawing:

Fig. 1 is a broken side elevation of a pair of embossing rollers, the view showing sections through two embodiments of the present invention at spaced positions on the roller;

Fig. 2 is a top plan view of one of the embodiments in position in the embossing roller;

Fig. 3 is a perspective view of one form of retaining ring;

Fig. 4 is a section taken through a modified embodiment of the invention;

Fig. 5 is a plan view of such embodiment; and

Fig. 6 is a section taken through a modified type supporting means, wherein the same is removable without removing the yieldable support.

A broken end elevation of a steel embossing roller 10 is illustrated in Fig. 1, such roller having a suitable design engraved thereon, the high portions of the engraving being indicated by the protuberances 11. This roller is adapted to engage a second roller 12, which in accordance with usual embossing practice is made from paper although in some instances it may also be made from steel. The rollers 10 and 12 are suitably journalled in

a supporting frame (not shown), and when the web of paper 14 passes between the rollers in the direction indicated by the arrow, the embossing rollers emboss a design thereon indicated at 15.

In accordance with the present invention, the embossing roller 10 has formed therein a plurality of spaced apertures 17 having a slightly reduced portion 18, thus forming a seat 19 adapted to receive an annular retaining ring 20 thereon. The seat is further provided with a plurality of spaced, threaded apertures 21 adapted to receive screws 22. The seat 19 normally provides an adequate support for the retaining ring 20 although in order to give additional support the ring may be formed with a plurality of substantially rectangular punched out apertures 24, the material which is punched out forming legs 25 which rest upon the lower wall 26 of the reduced aperture 18, the inner surfaces of the legs forming supports for the outer periphery of the type support during its inward and outward movement, as hereinafter described.

The ring is formed with a central aperture 28 within which is positioned the type support 30 which may be made from metal, wood or other suitable material. The special indicia which may be a trade-mark or any other desired material is indicated at 31 in Fig. 2, such indicia being preferably formed on a rubber type block 32 which is adhesively secured to the support 30. By forming this type of rubber instead of providing an engraved metallic plate, the chances of defacing such type, due to the pressure of the embossing rollers, is practically eliminated.

The type support 30 is formed with an annular flange 34, which flange is engaged by the retaining ring 20 and thus limits the outward movement of the type support. The inner surface of the support 30 is formed with a shallow central aperture 36 and the inner wall 26 of the aperture 18 is also provided with an aperture 37 of the same diameter of, and in alignment with, aperture 36.

A coiled compression spring 39 is received at its opposite ends in such apertures 36 and 37 and urges the type supports 20 outwardly. It will be noted that the outer surface of type block 32 is on substantially the same plane as the raised portions 11 of embossing roller 10 and as the latter revolves in the direction of the arrow, both the type 31 and the portions 11 are engaged by a conventional inking roller 40. As the type block continues its arcuate motion, it comes in contact with paper 14 at the point of contact between the embossing rollers 10 and 12. The rearward, yielding movement of the type block is very slight at this point, although it is sufficient to prevent defacing or crushing of the type.

When a given run is completed the screws 22 are removed, the retaining ring thus releasing the type support and another support carrying other type inserted.

The embodiment of the invention shown in Figs. 4 and 5 is similar to the preferred embodiment except that the flanged type support 43 carrying the type block 44 and the spring 45 are mounted in a recessed supporting member 46 which can be bodily removed from the roller 47 when it is desired to change the type. In this instance, the aperture 48 is of uniform diameter throughout and is of such size as to receive the member 46 which is desirably formed of sheet metal, and has a recess 49 in the base wall to receive one end of the spring. It is also provided with an inwardly turned, narrow annular flange 50 which enclosed the flange 51 on the type support 43. At spaced points around the aperture 48 are formed recesses 53 which receive retaining plates 54 secured therein by screws 55, the inner end of such plate 54 engaging the flange 50.

In the two foregoing embodiments of the invention the type support is removed from the aperture in the embossing roller when the type is to be changed. In Fig. 6, however, the type block support is formed in two portions 60 and 61, the inner portion 60 being formed with a dovetail recess 62 and the portion 61 having a male dovetail portion 64 on the rear surface thereof, such portion 61 also carrying the type block 66. In order to hold the type support 61 in proper position, the rear surface is formed with a central aperture 68 which is engaged by a detent 69 mounted in an aperture 70 in the support 60, such detent being urged by a spring 71 secured at its inner end by means of a screw 72. The other arrangements in Fig. 6, including the recessed supporting member 73, the spring 74, the recesses 75, plates 76 and screw 77, are similar to those shown in Figs. 4 and 5. It will be appreciated, however, that this two-piece support may be used in connection with the first embodiment of the invention and also that any suitable means other than the dovetail mounting may be employed. This general arrangement of the two-piece support may be even more satisfactory in connection with the structure illustrated in Fig. 1 since, when the type is to be changed, the screws 22 are loosened slightly, thus permitting retaining ring 20 to move outwardly to a point wherein the movable type support may be slipped off its complementary portion.

The use of ordinary machine screws to secure the retaining ring 20 in place is a relatively inexpensive means of accomplishing this result. In the event, however, that the type plates are to be changed relatively often some other means may be employed, such, for instance, as forming an undercut recess in the aperture 17 and locking the ring in place by giving the same a partial turn, thus locking it in the undercut recess. In instances, however, wherein aperture 17 is diamond shaped, square or otherwise non-circular, any other quick locking means may be employed.

It will also be apparent that many other structural modifications and changes may be made herein without departing from the spirit of the invention. For instance, it may be desirable to form the type support 30 from metal and thus reduce the thickness of the flange 34 to the thickness of the sheet metal which will eliminate any binding action in case the embossing rollers are operated at a relatively high speed. Also, the device may be modified by providing a plurality of springs of smaller diameter than the single spring 39. Also, as was previously suggested, it might be desirable to apply ink only to the type and not to the embossing roller per se. In this instance, the structure will be modified so as to cause the external surface of the printing block to normally lie in a plane just beyond the periphery of the steel embossing roller. Accordingly, the inking roller will touch the type face only and not the embossing roller.

What I claim is:

1. A machine of the class described for printing special indicia in discontinuous areas on a sheet of paper or the like and for embossing an all-over design on the remaining area of the sheet,

said machine including a pair of embossing rollers between which the sheet is fed, one of the embossing rollers having a plurality of substantially uniformly-spaced, shallow apertures therein, and means disposed within each aperture for supporting the special indicia-printing device, said device comprising a type-carrying block formed with an annular flange adjacent to its inner surface, the aperture having an enlarged portion adjacent to the outer periphery of the embossing roller, a retaining ring removably affixed to the shoulder formed by such enlarged portion and engaging the flange on the type-carrying block and limiting its outward movement, means comprising a coiled compression spring positioned between the inner wall of the aperture and the block for yieldingly urging the block outwardly, means for guiding the block in its inward and outward movement comprising a plurality of inwardly turned portions punched from the ring engaging the outer periphery of the flange, and resilient type carried by the block and normally lying outside the outer periphery of the roller, said type being convexly curved corresponding to the outer periphery of the roller.

2. A machine of the class described for printing special indicia in discontinuous areas on a sheet of paper or the like and for embossing an all-over design on the remaining area of the sheet, said machine including a pair of embossing rollers between which the sheet is fed, one of the embossing rollers having a plurality of substantially uniformly-spaced, shallow apertures therein, and means disposed within said apertures for supporting the special indicia-printing means, said latter means comprising a type support formed with an annular flange, each aperture having an enlarged portion adjacent to the outer periphery of the embossing roller, an apertured retaining ring removably affixed to the shoulder formed by such enlarged portion and engaging the flange on the type support, said ring being formed with a plurality of punched-out portions, the material from such portions being inwardly bent, forming feet engaging the inner wall of the aperture, the inner surfaces of said portions forming guideways for the flange on the type support, a type element formed of resilient material carried by the support, the outer surface of the element being convexly curved and normally lying just outside the outer periphery of the roller, and yieldable means comprising a coiled compression spring urging the type support outwardly.

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