June 9, 1931. R. S. HOPKINS 1,809,238

PLATEN FOR PHOTOGRAPHIC PRINTING MACHINES

Filed Dec. 23, 1927

FIG. 1.

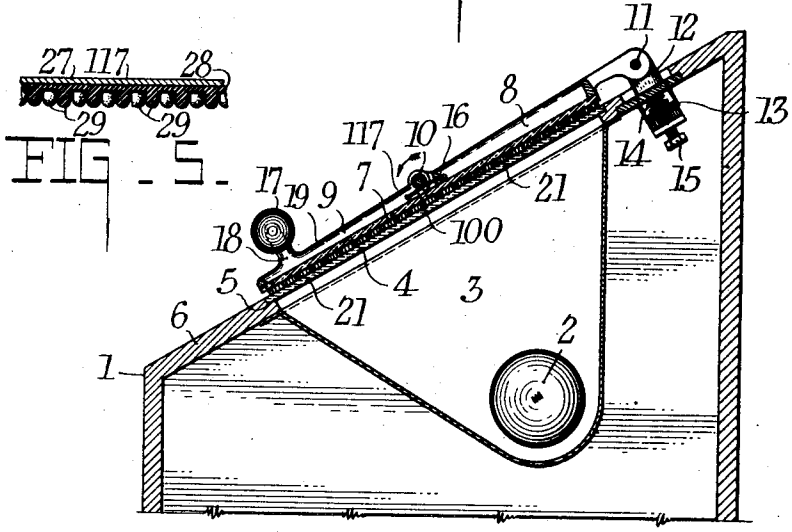


FIG. 5.

FIG. 2.

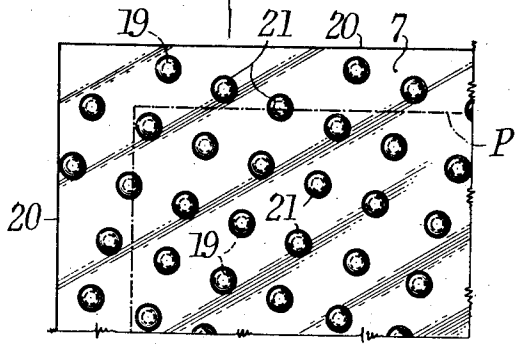


FIG. 4.

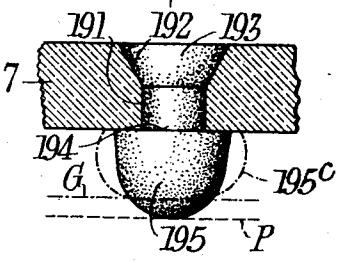
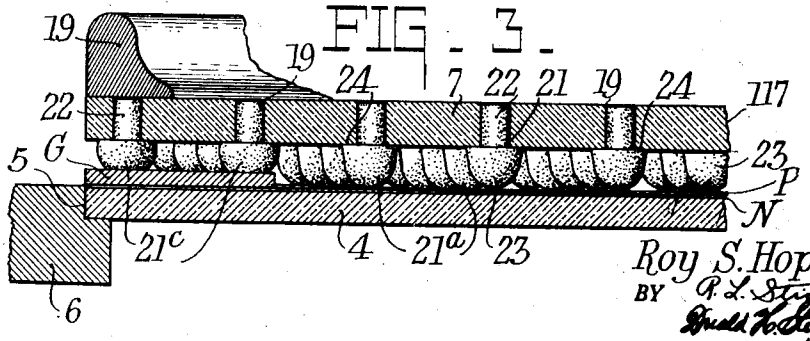


FIG. 3.



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UNITED STATES PATENT OFFICE

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PLATEN FOR PHOTOGRAPHIC PRINTING MACHINES

Application filed December 23, 1927. Serial No. 242,150.

This invention relates to photography, and more especially to photographic printing machines. One object of my invention is to provide a platen which will give good contact, that is, one which will press a sheet of paper into contact with a negative. Another object is to provide such a platen with means for compensating for considerable differences in thickness of the materials used in printing, such as negatives, masks, paper, and the like. Another object is to provide a platen in which the major portion of the platen may be transparent and small portions thereof may be opaque, the latter portions being adapted to hold the printing paper. Another object is to provide a platen, the surface of which is normally spaced from the printing panel, and the paper holding members being resilient, and, therefore, adapted to compensate for deviations from a plane surface in both the platen and printing panel, and other objects will appear hereinafter, the novel features being pointed out in the claims at the end thereof.

Coming now to the drawings wherein like reference characters denote like parts throughout:

Fig. 1 is a fragmentary sectional view of a printing machine having a platen constructed in accordance with and embodying a preferred form of my invention;

Fig. 2 is an enlarged fragmentary bottom plan view of a portion of a platen plate;

Fig. 3 is a fragmentary sectional view of a portion of a printing panel and platen plate;

Fig. 4 is an enlarged detail section of another type of resilient contact member;

Fig. 5 is a fragmentary section illustrating another embodiment of my invention.

In certain classes of photographic printing the thickness of photographic material upon the printing panel may vary to a considerable degree, for instance, a mask having a negative guide or paper guide of considerable thickness may be used, so that in order to provide good contact it is desirable to have portions of the platen compressed to a greater degree than other portions.

As illustrated in Fig. 1, the printing machine may comprise a housing 1 in which there is a lamp 2 mounted in a reflector 3 beneath a printing panel 4 carried by a rabbet 5 in the slanting front 6 of the cabinet. A platen 7 may be carried by a frame consisting of two parts 8 and 9 hinged together at 10, section 8 being hinged at 11 to a yoke 12. The printing panel 4 and platen 7 constitute a printing frame adapted to hold a sheet of photographic paper in contact with a negative during the printing operation.

I prefer to mount the yoke 12 resiliently, and in the present embodiment the yoke 12 includes a cross bar 13 resiliently supported by the springs 14, there being a set screw 15 by which the extent of movement is limited.

I also prefer to provide a coil spring 16 tending to turn platen section 9 about its hinge 10 in the direction shown by the arrow. Handle 17 carried by lugs 18 of the platen frame 19 is also provided for moving the platen to and from the printing panel.

As thus far described the printing machine is merely a typical one which has been selected as suitable for illustrating my invention. In order to provide a platen through which the printing operation may be watched and which will have an extremely resilient contact with the photographic material, the structure hereinafter described may be employed. I prefer to provide transparent platen plates 7 of tinted or colored pyroxylin, the tint being such that the operator will not be blinded by looking through the platen at the printing light. The pyroxylin plates are provided with a series of apertures 19, and it is desirable to arrange the rows of apertures at an angle to the edges 20 of the platen plates. Into each aperture a resilient contact member designated broadly by 21 may be placed so that a series of relatively small resilient projections are provided on that side of the platen plate which faces the printing panel.

As shown in Fig. 3, the contacting members 21 may consist of a shank portion 22 and a head 23 which is provided with a shoulder 24 between the head and the shank. The shank closely fits into the platen apertures 19, and if desired may be firmly held therein by cement. Thus it will be seen that the major

portion of the platen is transparent so that "dodging" may be watched through the platen during the printing operation, as a comparatively small portion of the platen is covered by the resilient contact members.

With this type of construction, as is shown in Fig. 3, firm and even pressure is applied at close intervals all over the printing paper or upon any material laid on the printing panel. In Fig. 3 I have shown a negative N on which is laid a sheet of printing paper P, there being also provided a guide member G for locating the paper such as is commonly used in double printing. The contact members 21*c* have been flattened out by the pressure applied to these platen areas, and contacts 21*a* have been compressed only to a very slight extent. Since these contacts are closely spaced the paper is held flat.

I have found that the most satisfactory results can be obtained by arranging the contact members in rows at an angle to the edges of the platen because ordinarily a print is made with the edges of the print substantially parallel to the edges of the platen and by arranging the rows, as shown, for instance, in Fig. 2, the contacting members will be more or less irregularly disposed over the surface of a sheet of paper indicated in dot and dash lines at P.

While I have illustrated the resilient contacts as being evenly spaced this is not necessary so long as they are arranged close enough to prevent the paper from bending upwardly thus losing contact with the negative. It is, of course, useful to separate the contacts as far as possible since this leaves a larger area of the platen transparent, and the printing operation may be readily viewed. If desired, the contacts may be carried upon an opaque platen in which case they may be arranged as closely as desired, it only being necessary to leave sufficient room between them for expansion under pressure, such a structure will be hereinafter more fully described.

If desired, the resilient contacts 21 may be cast into apertures 191 which are countersunk at 192 so that a head 193 will be formed on the shank 194 of the contact, thus holding it firmly in place without the use of cement. As shown in this figure, the head 195 is in its normal print contacting position. When under normal pressure only a small portion of the head is brought into engagement with the printing paper. When, however, the contact strikes a projection such as a paper guide G the head 195 may be compressed and the shape will change, as indicated by the dot and dash line 195C.

I prefer to form the contact members of soft rubber, although any other resilient material may be equally suitable.

As shown in Fig. 5, if an opaque platen plate 27 is used the resilient contacts may be made in the form of a sheet 28 on which the contacts 29 are integrally formed. This sheet may be cemented upon plate 27 or may be fastened to it in any desired manner, such as by vulcanizing. While such a platen does not have the advantage of being translucent, like the embodiment shown in the other figures, I have found a platen resiliently pressing over relatively small areas of the printing paper will give more uniform good contact under varying conditions than other structures which I am familiar with.

In both the embodiments illustrated the platen, designated broadly as 117 is provided with an irregular or roughened surface only a relatively small area of which contacts with the printing paper, the major portion (plate 7 or 27) of the platen being spaced from the point of contact. This has the advantage of added resiliency in allowing the shape of the contacts to expand under compression, and, when used with a transparent plate, the additional advantage of leaving the major portion of the platen translucentor transparent for visual observation of the printing operation.

It should be noticed, that with a platen constructed as above described it is immaterial whether or not the surface of the printing panel or platen is perfectly flat, because the resiliency of the protuberances automatically cares for any such variations between these parts. This is useful because in large sizes plate glass rarely has a true plane surface, and even when it has it is difficult to make a platen which will accurately fit the printing panel. With the resilient protuberances good contact is secured even though the printing panel and platen are considerably out of parallel.

Most of the force necessary to operate the usual type of printer is used in an attempt to physically press the platen upon the printing panel so tightly that good contact will result. With the above described very resilient spaced protuberances the major portion of the platen is spaced from the panel and only a minimum amount of force is necesary to operate the platen as only the resilient protuberances are compressed, and these only to a slight degree.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is,—

1. In a printing device, the combination with a printing panel, of a platen mounted to move to and from the panel, and means including a substantially flat transparent platen surface having projections thereon, said projections being made of resilient material, and forming contacts adapted to engage printing material laid on the panel.

2. In a printing device the combination with a printing panel, of a platen mounted to move to and from said panel, said platen in-

cluding a substantially flat plate having a series of apertures therein, and a plurality of contact members mounted in the apertures.

3. In a printing device the combination with a printing panel, of a platen mounted to move to and from said panel, said platen including a substantially flat light transmitting plate having a series of apertures therein, and a plurality of contact members mounted in the apertures.

4. In a printing device and combination with a printing panel, of a platen mounted to move to and from said panel, said platen including a substantially flat light transmitting plate having a series of apertures therein, and a plurality of resilient contact members mounted therein.

5. In a printing device the combination with a printing panel, of a platen movable to to and from the panel, said platen including an apertured plate, contact members having enlarged heads on shanks mounted on the plate by means of the shanks extending into the apertures, said enlarged heads projecting from the platen toward the printing panel.

6. In a printing device the combination with a printing panel, of a platen movable to and from the panel, said platen including an apertured plate, rubber contact members supported in the apertured plate, said rubber contact members having enlarged heads.

7. In a printing device the combination with a printing panel, of a platen movable to and from the panel, said platen including a flat plate and a contacting face of relatively small spaced rubber protuberances adapted to hold a sheet of paper flat spaced from the flat plate.

8. In a printing device the combination with a printing panel, of a platen movable to and from the panel, said platen including a contacting face of relatively small resilient protuberances arranged in rows at an angle to the edges of the platen.

9. In a printing device the combination with a printing machine, of a platen mounted to move to and from the platen, said platen including an apertured plate, a plug, a head and shank separated by a shoulder on the plug, said plug having the shank engaged in the aperture with the head projecting from the plate, the shoulder preventing the plug from being pushed through the aperture, said head projecting from the platen toward the printing panel.

10. In a printing device the combination with a printing machine, of a platen mounted to move to and from the platen, said platen including an apertured plate, a plug of resilient material, a head and shank separated by a shoulder on the plug, said plug having the shank engaged in the aperture with the head projecting from the plate, the shoulder preventing the plug from being pushed through the aperture, said head projecting from the platen toward the printing panel.

11. In a printing device, the combination with a printing panel of a platen movably mounted with respect thereto, said platen having an irregular contacting surface, a relatively small area of which is adapted to contact with and hold a sheet of photographic paper flat on the printing panel, the major portion of the surface being spaced from the paper.

Signed at Rochester, New York this 16th day of December 1927.

ROY S. HOPKINS.