April 11, 1944. J. K. POLHEMUS ET AL 2,346,329

PHOTOGRAPHIC PRINTING DEVICE

Filed Aug. 2, 1940 3 Sheets-Sheet 1

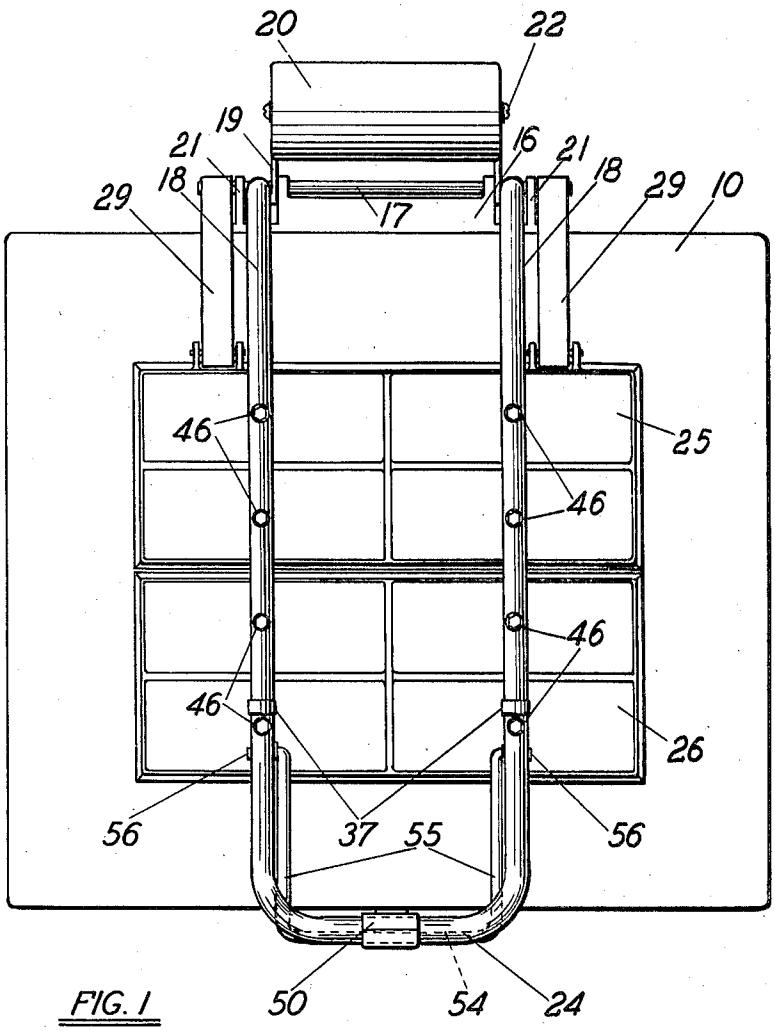


FIG. 1

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PHOTOGRAPHIC PRINTING DEVICE

Filed Aug. 2, 1940 3 Sheets-Sheet 2

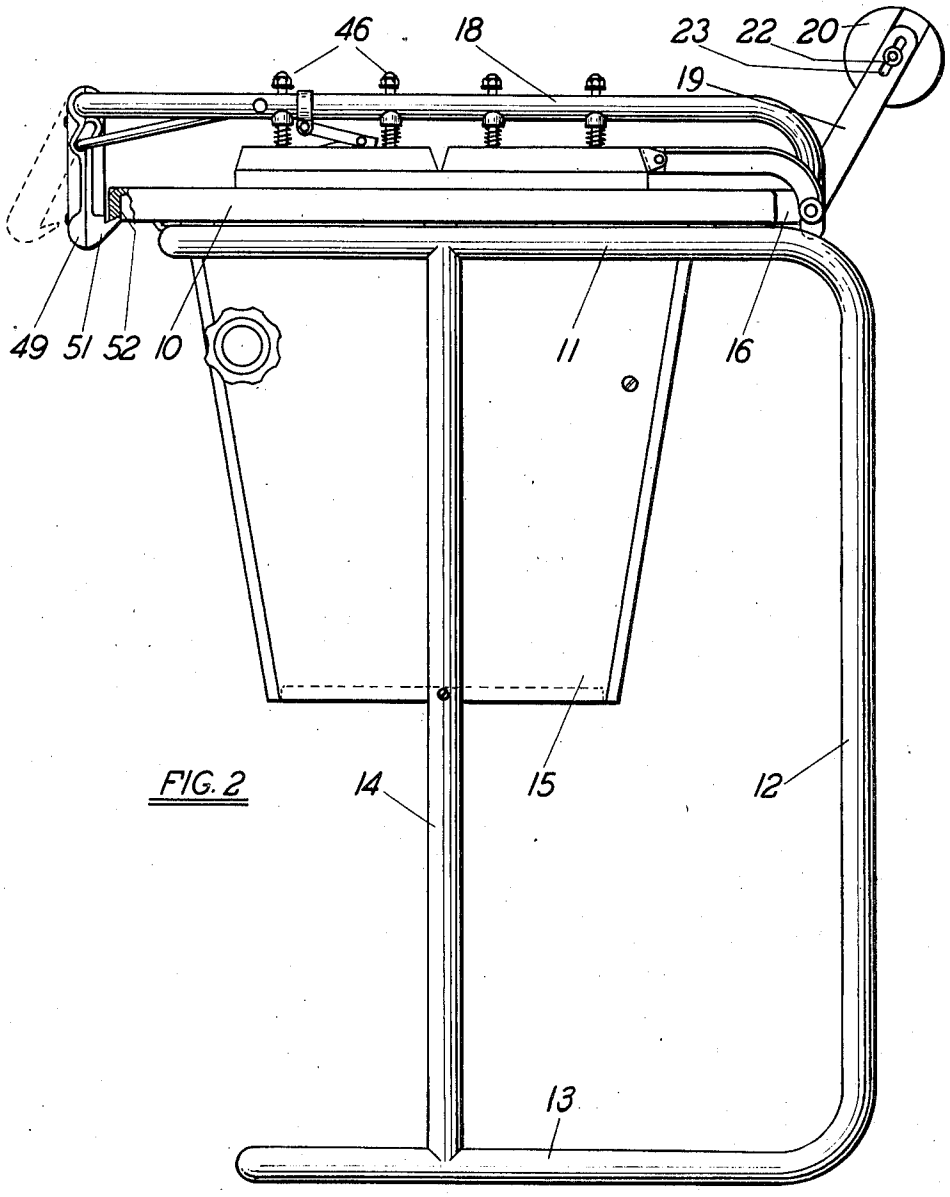


FIG. 2

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Filed Aug. 2, 1940 3 Sheets-Sheet 3

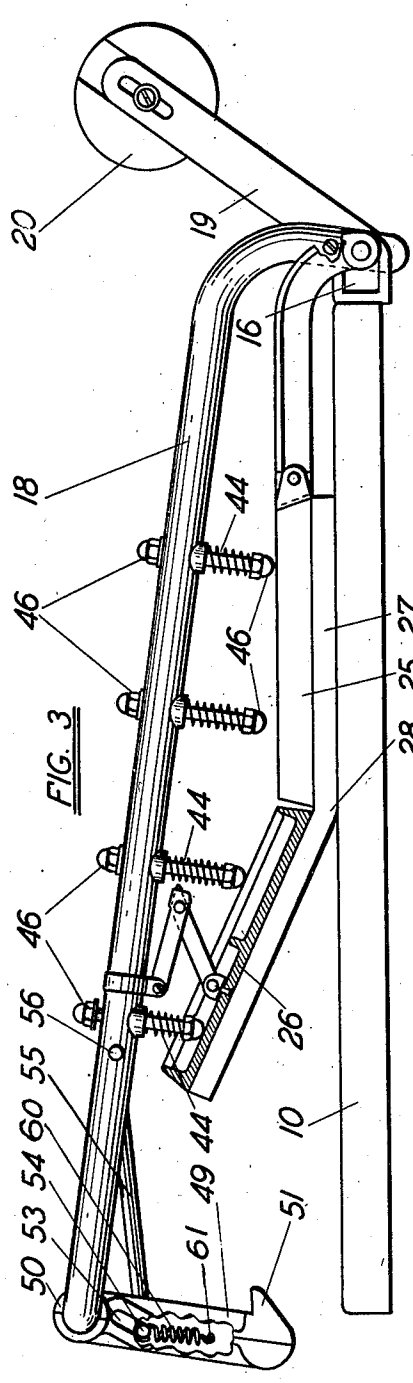


FIG. 3

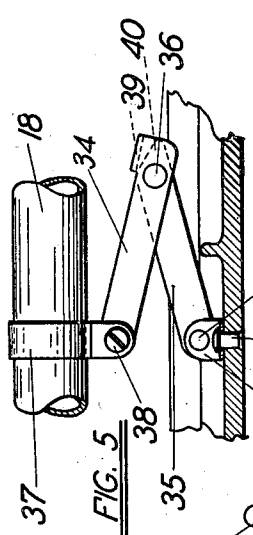


FIG. 5

FIG. 4

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UNITED STATES PATENT OFFICE

2,346,329

PHOTOGRAPHIC PRINTING DEVICE

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Application August 2, 1940, Serial No. 349,577

6 Claims. (Cl. 95—73)

This application is concerned with a photographic printing device, and more particularly with a pressure back and latch for holding the printing material against a suitable supporting platen.

Printers have been used for some time in which a lamp house is carried by a suitable frame, with a supporting platen for the photographic material mounted above said lamp house. Various means have been provided for holding the photographic negative and the printing material against such a supporting platen. Where the printer is of substantial size, the holding means must necessarily be made in one or more parts, and it is difficult to maintain a smooth contact between these various parts and the supporting platen. Furthermore, the latching means previously provided for holding the pressure back against the supporting platen have been unsatisfactory since they have been difficult or inconvenient to operate.

The present invention provides a novel pressure back for such a printer and improved locking means for said back which are not subject to the previous disadvantages.

It is accordingly one object of this invention to provide a pressure back for a printing device which maintains smooth and even contact against the supporting platen.

A further object is to provide such a back in the form of two or more separate plates which are hingedly connected by a single flexible platen-engaging pad.

A still further object is to provide carrying and operating arms connected to said plates by means which will permit limited relative adjusting movement between said arms and plates.

Another object is to provide a locking means for said pressure back which can be readily operated to release the back and permit movement of the latter away from the platen.

An additional object is to provide such a latch with a horizontal releasing bar which can be readily grasped by the fingers of the same hand used for lifting the pressure back.

Further objects and advantages will be apparent from the following specification.

A preferred form of the invention has been disclosed in the attached drawings forming a part of this application, in which:

Figure 1 is a top view of a supporting platen and pressure back according to the invention;

Figure 2 is a side elevation of a complete printing machine embodying the construction of Figure 1;

Figure 3 is an enlarged side view of the platen and back, with the back lifted slightly from the platen;

Figure 4 is a view similar to Figure 3, but with the back still further removed from the platen; and

Figure 5 is an enlarged detail view of the connection between the operating arm and platen-engaging plate of said pressure back.

In order that those persons skilled in the art may fully understand the nature and scope of the present invention, the following detailed description will now be given, with particular reference to the drawings, wherein like reference characters indicate like parts.

As shown in Figures 1 and 2, the construction includes a supporting platen 10 which is carried by a suitable frame member 11. This frame member 11 may be of tubular metal construction and is preferably bent to form a single tubular frame unit for supporting said platen at a suitable distance above the floor. Thus, the supporting member 11 is bent to form a vertical post 12, the bottom of the post being in turn provided with the horizontal portion 13 for engaging the floor. It will be apparent that this carrying frame 11, 12, and 13 may be duplicated on each side of the printing machine. An additional vertical strengthening brace 14 may also be included in order to provide a more stable form of construction.

A suitable lamp house 15 is mounted below the supporting platen 10 and is advantageously carried by the frame 11 and brace 14. The details of construction of this lamp house have not been included since they form no part of the present invention and are well known in the art.

Above the lamp house the supporting platen 10 is provided with a suitable opening 57 (Figure 4), above which the printing material is to be placed. In order to form a support for this printing material, a transparent plate 58 is mounted on suitable shoulders 59 in said opening 57. The plate forms a smooth surface which is substantially level with the top of the remaining portion of platen 10.

The platen 10 or frame 11 may be provided with a suitable supporting bracket 16 for the customary pressure back. As shown in Figure 1, this supporting bracket 16 carries a suitable axle 17, on which the operating arms 18 of the pressure back are pivoted. These operating arms ex-

tend from the axle across the supporting platen and are provided with a horizontal cross-piece or handle bar 24 at their opposite end. Bar 24 is preferably round or tubular in cross-section so that it can be readily grasped by the operator for controlling the position of the pressure back.

Fastened to the arms 18 and also pivoted on axle 17 are arms 19 which carry a suitable counter weight 20. The distance of this counter weight from the axle 17 may be regulated by means of the screws 22 on said counter weight, said screws being mounted in slots 23 in the carrying arms 19.

In order to strengthen the bearing means for the axle 17, it may be desirable to provide additional bearing flanges 21 which hold said axle adjacent and outside of the points at which arms 18 are mounted.

The construction of the platen-engaging back will now be described in greater detail. The pressure back includes two plates 25 and 26, the first of which is pivotally mounted with respect to the supporting platen, and the second of which is operably connected to the operating arms 18. These two plate members 25 and 26 are provided on their lower or platen-engaging faces with a flexible pad 27 formed of rubber or other equivalent material. This flexible pad 27 forms the sole pivoted or hinge connection between the plate members 25 and 26. This flexible hinge connection, as at 28, permits the plates to engage the platen successively and thus secure a more even contact therewith. This particular construction has obvious advantages over the previous arrangements in which the two plates were provided with separate pads and were hinged together at their upper surfaces. In such prior arrangements there was a gap between the pads, and it was impossible to secure at all times a smooth and even pressure against the printing material at this point.

The plate 25, as indicated above, is pivoted with respect to the platen by the carrying arms 29. For convenience, these arms 29 may be pivoted on the same axle 17 employed for the support of the operating arms 18. Carrying arms 29 are joined to the plate 25 by pins 30 carried by brackets 31 on the plate. As shown in Figure 4, the arm 29 has a projecting lug 32 which cooperates with the angular surface 33 of the plate to limit the relative clockwise rotation of the plate with respect to the arm. As the front of the plate is lifted (by the mechanism to be described), the lug 32 will bear tightly against the surface 33, and the plate 25 and arm 29 will be lifted away from the supporting platen 10, as if they formed a single unit pivoted on axle 17. At the same time the above limiting means will permit plate 25 to rotate slightly in a counter-clockwise direction with respect to arms 29 in order to accommodate the plate to possible irregularities in the printing material or supporting platen. This feature of construction is of definite advantage over previous arrangements in which the plate was rigidly held by the carrying arm.

As indicated in the drawings and described above, the front of plate 25 is hinged to the rear of plate 26 by the flexible pad 27. The front of plate 26 is operatively connected to the operating arms 18 by suitable control links 34 and 35. Thus, links 34 are pivoted at 36 to clamping members 37 fastened to the operating arms 18 (see Figure 5). The other ends of links 34 are pivoted to links 35 at points 36. Links 35 are in turn pivotally fastened to brackets 42 at points 41, these brackets 42 being fastened to plate 26 by suitable rivets 43 or other desired means.

Arms 34 are provided with limiting flanges 39 which cooperate with the extensions 40 on links 35 to limit the relative clockwise movement of link 34 with respect to link 35. When the operating arms 18 are lifted away from the platen, the flange or lug 39 will engage the extension 40 and will prevent relative movement between the links 34 and 35. Thus, the control links will remain at a relatively small angle with respect to each other and will lift the front portion of plate 26 away from the platen, as shown in Figure 3. Further movement of the operating arms 18 will lift not only the front plate 26, but also the rear plate 25 and arms 29, as shown in Figure 4.

Obviously, when arms 18 are again moved toward the platen 10, the foregoing order of operation will be reversed and plates 25 and 26 will successively engage the platen. As soon as front plate 26 is fully in contact with the platen, further movement of the operating arms 18 will simply cause relative counterclockwise rotation of link 34 with respect to link 35, as indicated in Figure 5. The use of these connecting links is a distinct improvement over the chains or leather straps used in the prior art. Thus the links are less subject to wear and can not become twisted or kinked. Furthermore the solid links have a definite steadying effect against lateral shifting of the plates 25 and 26.

In order to hold all portions of the plates 25 and 26 and the attached pad 27 in firm and smooth contact against the platen, the operating arms 18 are provided with a plurality of resilient plate-engaging members 44. As shown in Figure 4, these resilient plate engaging members 44 may consist of rods 45 which are vertically slidable in the arms 18. Rods 45 may be threaded at each end for engagement with suitable heads 46. Locking disks 47 are slidably mounted on the rods 45 below the operating arms, and suitable springs 48 are placed on said rods between the locking disks 47 and the lower heads 46. It will be apparent that, by reason of this construction, the rods are resiliently urged toward the plates 25 and 26. As shown in Figure 2, the rods engage the plates and are forced upwardly with respect to arms 18 against the action of springs 48, when these arms 18 are in the locking position shown in said figure.

In order to hold the operating arms in locked position, we have provided a pivoted latch member 49. Member 49 has a suitable bearing portion 50 which is rotatably located on the handle bar 24. This latch member 49 is thus movable between the locking position shown in heavy lines in Figure 2, and the releasing position shown in dotted lines in said figure. A suitable locking lug 51 on the latching member 49 cooperates with a corresponding latch portion 52 on the supporting platen, to hold the latch member and operating arms 18 in locked position.

In order to release the latch member and operating arms, said member is provided with a diagonal cam slot 53. A horizontal release bar 54 cooperates with said cam slot to move the latch member 49 to the dotted line position of Figure 2, when said release bar is lifted toward the handle bar 24. This release bar 54 is advantageously carried by or formed as a part of releasing arms 55 pivoted to the operating arms 18 at points 56. In order to urge the latch member to the

heavy line position of Figure 2, the latch member is preferably hollow in construction and is provided with a return spring **60** fastened at one end to the release bar **54** and at the other end to a lug **61** on the latch member. This spring urges the release bar **54** downwardly away from the handle bar **24** and, by reason of the cam slot **53**, tends to force the latch member to locking position.

To lock the pressure back against the platen; it is only necessary to depress the operating arms and handle bar until the latch member is engaged under the platen. Furthermore, since the cam slot **53** is close to the handle bar **24**, it will be seen that the horizontal handle bar and release bar may be readily gripped by the fingers of one hand and squeezed together in order to release the latch and permit upward movement of the pressure back. This readily operable catch and releasing mechanism involving the use of parallel handle and release bars, has many apparent advantages over any of the prior art constructions known to us.

Since additional objects and advantages of the construction disclosed herein will be apparent to those skilled in the art, and since these same advantages may be obtained by various equivalent forms of construction, it is our intention that the present invention should not be limited to the precise structure shown in the drawings, but should be interpreted broadly within the scope and spirit of the attached claims.

Now therefore we claim:

1. A printing apparatus having a lamp house, a supporting platen on said lamp house provided with a transparent portion for the exposure of the print, and a pressure back for holding the material to be printed against said platen, said back including a carrying arm pivotally mounted with respect to said platen, a first platen-engaging plate pivoted to said arm, cooperating angular surface means on the end of said plate and arm for limiting relative rotation between said plate and arm in clockwise direction, a second platen-engaging plate hinged to said first plate, and an operating arm connected to said second plate and also pivotally mounted with respect to said platen for moving said plates into and out of contact with said platen.

2. A printing apparatus having a lamp house, a supporting platen on said lamp house provided with a transparent portion for the exposure of the print, and a pressure back for holding the material to be printed against said platen, said back including a platen-engaging plate movably mounted with respect to said platen, an operating arm pivotally mounted with respect to said platen, and connecting means between said arm and plate, said means consisting of two control links pivoted to each other and to said arm and plate respectively, said control links having interengaging means limiting relative rotation in one direction between said links whereby said plate is lifted by said operating arm while said control links are still at a relatively small angle with respect to each other.

3. In a printing machine having a supporting platen and a pressure back, the combination comprising an operating member connected to said pressure back and pivoted at one end with respect to said platen for movement of the back and operating member to and from said platen, a horizontal handle bar at the other end of said operating member, a latch member pivoted to said handle bar for rotation about the latter between two positions, in one of which said latch may engage said platen to hold the pressure back thereagainst, and in the second of which said latch remains out of engagement with said platen, and a horizontal release bar substantially parallel to and spaced slightly from said handle bar and movable toward and away from said handle bar, said latch and release bar having interengaging means for movement of the latch to its second position when said release bar is moved toward said handle bar and for movement of the release bar away from the handle when said latch is restored to its first position.

4. In a printing machine having a supporting platen and a pressure back, the combination comprising an operating member connected to said pressure back and pivoted at one end with respect to said platen for movement of the back and operating member to and from said platen, a horizontal handle bar at the other end of said operating member, a latch member pivoted to said handle bar for rotation about the latter between two positions, in one of which said latch may engage said platen to hold the pressure back thereagainst, and in the second of which said latch remains out of engagement with said platen, resilient means normally urging said latch to its first position, and a horizontal release bar substantially parallel to and spaced slightly from said handle bar and movable toward and away from said handle bar, said latch and release bar having interengaging means for movement of the latch to its second position when said release bar is moved toward said handle bar and for movement of said release bar away from said handle when said latch is restored to its first position by said resilient means.

5. In a printing machine having a supporting platen and a pressure back, the combination comprising an operating member connected to said pressure back and pivoted at one end with respect to said platen for movement of the back and operating member to and from said platen, a horizontal handle bar at the other end of said operating member, a latch member pivoted to said handle bar for rotation about the latter between two positions, in one of which said latch may engage said platen to hold the pressure back thereagainst, and in the second of which said latch remains out of engagement with said platen, and a horizontal release bar carried by arms pivoted to said operating member, said release bar being substantially parallel to said handle bar and being rotatable with said arms toward and away from said handle bar, said release bar and latch having interengaging cam means for movement of the latch to its second position as said release bar is moved toward said handle bar and for movement of the release bar away from the handle when said latch is restored to its first position.

6. In a printing machine having a supporting platen and a pressure back, the combination comprising an operating member connected to said pressure back and pivoted at one end with respect to said platen for movement of the back and operating member to and from said platen, a horizontal handle bar at the other end of said operating member, a latch member pivoted to said handle bar for rotation about the latter between two positions, in one of which said latch may engage said platen to hold the pressure back thereagainst, and in the second of which said latch remains out of engagement with said platen,

resilient means normally urging the latch to its first position, and a horizontal release bar carried by said operating member substantially parallel to and spaced slightly from said handle bar and movable toward and away from said handle bar, said latch having a cam slot engaged by said release bar for movement of the latch to its second position when said release bar is moved toward said handle bar and for movement of said release bar away from said handle when said latch is restored to its first position by said resilient means.

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