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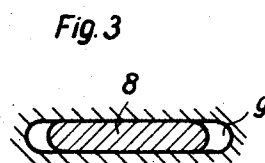
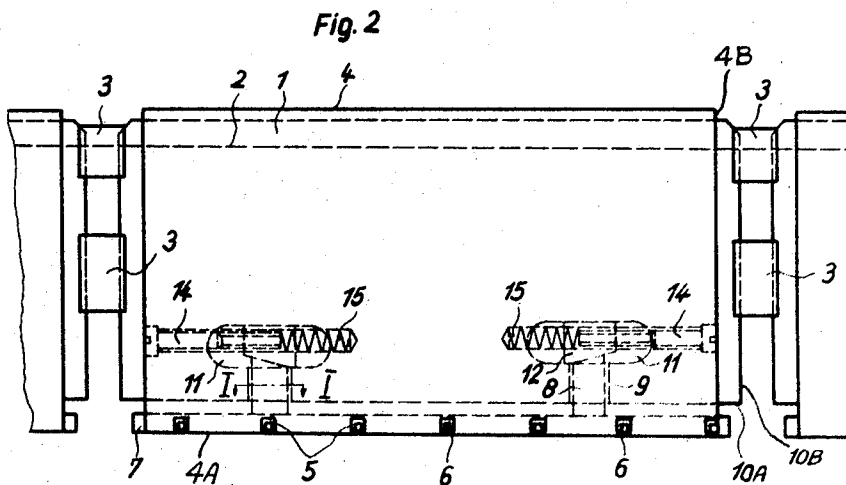
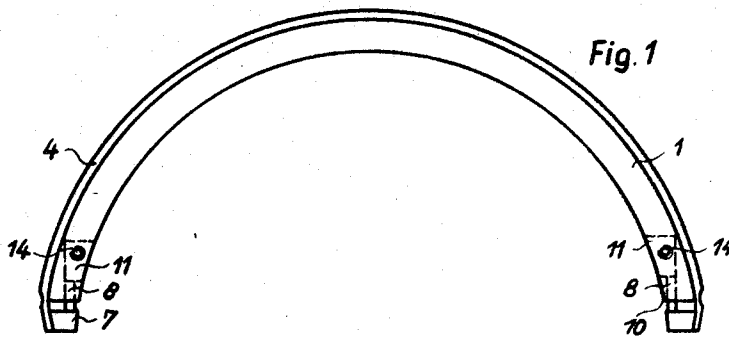
P. HEIMLICHER ET AL

3,470,817

CLAMPING DEVICE FOR FLEXIBLE PRINTING PLATES

Filed Aug. 22, 1967

2 Sheets-Sheet 1



INVENTORS

PAUL HEIMLICHER
RENE BÜRKI

By: *McGraw and Toren*
ATTORNEYS

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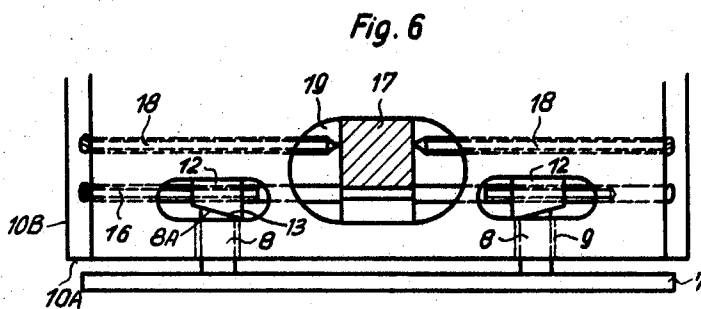
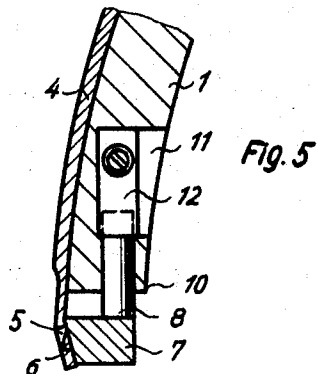
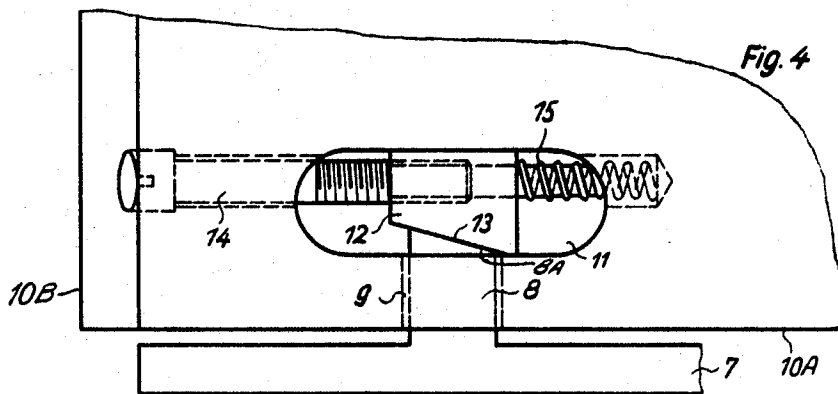
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INVENTORS
PAUL HEIMLICHER
RENE BÜRKI
By *McBlew and Toren*
ATTORNEYS

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**CLAMPING DEVICE FOR FLEXIBLE
PRINTING PLATES**

Paul Heimlicher, Bolligen, and René Bürki, Bern, Switzerland, assignors to Fallert Winkler & Co. Ltd., Bern, Switzerland

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10 Claims

ABSTRACT OF THE DISCLOSURE

A clamping device for securing flexible printing plates on a rotary printing press composed of a clamping saddle and means for securing the flexible printing plate on the saddle. A pair of spaced elongated grooves are positioned along the longitudinal edges of the saddle and a movably positionable support member is disposed within each of the grooves having a support surface directed toward and disposed at an oblique angle to the longitudinal edge. The support surfaces in each pair of support members along a longitudinal edge are disposed in oppositely sloping directions with respect to the edge. Screw members are positioned within the saddle attached to the support members for positioning them along the longitudinal edge of the saddle. A clamping bar extends along the longitudinal edge of the saddle spaced outwardly from the support members. Gripping members are provided on the clamping bar to engage slots or openings in the edge of the flexible plate for holding it in position. Slots are formed in the clamping saddle extending between the support surface of the support members to the longitudinal edge of the saddle. A support arm extends from the clamping bar through each of the slots into contact with the support member. The support arm has a contacting surface disposed in parallel touching relationship with the contacting surface on the support member. Due to the angular disposition of the support surfaces of the support member and support arm with respect to the longitudinal edge of the clamping saddle, when the support members are moved in a direction parallel to the longitudinal edge the support arms are urged in a direction normal to the longitudinal edge, forcing the clamping bar outwardly for securing the flexible printing plate in position on the clamping saddle. Additionally, the support members may be adjusted to exert a diagonal stress on the flexible plate in the event that it is necessary to do so to properly align it on the clamping saddle.

THE PRIOR ART

The present invention is directed to a clamping device for securing a flexible printing plate on a rotary printing press and, more particularly to an arrangement for securing the plate by moving it either transversely, longitudinally or diagonally with respect to the axis of the rotary press.

The appearance of thin flexible printing plates, the so-called winding plates, has provided a problem in printing presses which are equipped to receive the thicker stereotype plates, this has been a particular problem in relief printing. Merely pasting the plates, as has been known for a long time, is not satisfactory because of the difficulty in properly registering the plate on the printing press. Further, when the plates are removed from the press, the removal operation usually results in the destruction of the winding plates.

Though it has been known to use holding devices for securing the thin flexible plates, a workable arrangement has not been achieved to date. One of the problems has

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been the difficulty in obtaining proper registration of the flexible plate on the saddle. In one arrangement a great number of screws were employed about the periphery of the flexible plate for securing it to the saddle. While the screws assisted in achieving proper registration, there was the risk that individual screws might be tightened too much, the plate would be deformed. Additionally, in such an arrangement the time required for properly securing and aligning the flexible plate was excessive. The devices employed to date have not taken into account the fact that the sides of the winding plates are not always cut or punched at right angles. Accordingly, in securing the plates on the printing press, it must be possible to position one corner outwardly to a greater extent than the others, or, in other words, to dispose the edges in slanting relationship.

In the patent to Strahorn, No. 3,107,610, issued Oct. 22, 1963, an arrangement is shown for securing flexible plates along one edge. A pair of wedging surfaces is employed for forcing a longitudinal edge of the flexible plate into engagement with a catch along the edge. In this device it is not possible to displace the flexible plate diagonally with respect to the axis of the printing press. While, under normal condition, a plate can be secured tightly on the saddle, it is not possible to align it properly in the event the sides of the plate are not arranged perpendicularly to one another.

SUMMARY OF THE INVENTION

It is the primary object of the present invention to provide a clamping device for a flexible plate on a rotary printing press which permits the plate to be positioned longitudinally, transversely and also diagonally with respect to the axis of rotation of the press.

It is an object of the present invention to provide separate members along the longitudinal edge of a clamping saddle for individually positioning the opposite ends of the edge of a flexible plate to afford any diagonal alignment which might be required.

Another object of the present invention is to provide means for simultaneously positioning the support members along a longitudinal edge of the clamping saddle.

Still another object of the invention is to provide contacting surfaces on the elements which position a flexible plate on a clamping saddle for translating a movement parallel to the longitudinal edge of the clamping saddle into a movement normal to the longitudinal edge.

A further object of the invention is to provide an arrangement for securing a flexible plate in position on a clamping saddle which is simple in construction and easy to assemble and to adjust.

Moreover, another object of the invention is to provide a clamping device which supplies an improvement over presently known devices for obtaining proper registration of flexible printing plates on clamping saddles, even though the edges of the plates may not be properly disposed at right angles to each other.

The present invention provides an arrangement not only for tightly securing a flexible printing plate to a clamping saddle on a rotary printing press, but it also assures the proper registration of the plate on the saddle even if a diagonal displacement of one or both edges of the plate is required with respect to the axis of the printing press. Support members are positioned within the clamping saddle with support surfaces disposed at an oblique angle to the longitudinal edge of the clamping saddle. The support surfaces along each longitudinal edge are disposed in oppositely sloping directions with respect to the longitudinal edge. Means, such as threaded bolts, are secured to the support members and to the clamping saddle for moving the support members in a direction parallel to the longitudinal edge. Spaced outwardly from the longitudinal edge

is a clamping bar having teeth or other gripping means arranged to fit into slots or openings along the edge of the flexible plate and to assist in properly securing the plates in the circumferential direction about the surface of the clamping saddle. Extending from the clamping bar toward the clamping saddle and into contact with the support members are support arms each having a support surface disposed in parallel relationship with the support surface on the support member. With the support surfaces of the support members and support arms disposed obliquely with relationship to the longitudinal edge of the clamping saddle, when the support member is moved in a direction parallel to the longitudinal edge, the support arm is moved in a direction normal to the longitudinal edge and as the support arm is forced outwardly from the saddle, the clamping bar securely grips and holds the flexible plate tightly in position. If a diagonal adjustment is required in the flexible plate, the individual support members may be positioned in an unbalanced manner whereby one end of an edge on the flexible plate is forced outwardly to a greater extent than the other end to provide the proper registration.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 shows an end view of a clamping device for a rotary printing press incorporating the present invention; FIG. 2 is a side view of the clamping device shown in FIG. 1;

FIG. 3 is an enlarged partial sectional view taken along line I—I of FIG. 2;

FIG. 4 is an enlarged view of a portion of the clamping device shown in FIG. 2;

FIG. 5 is an enlarged partial sectional view of one end of the clamping device as shown in FIG. 1; and

FIG. 6 is a side view of another embodiment of the present invention viewed from the opposite side of the clamping device to that illustrated in FIG. 2.

DESCRIPTION OF THE INVENTION

In the present invention a clamping saddle 1 is secured to a printing plate cylinder 2 in a manner similar to securing a stereotype printing plate and is secured in position by means of bevels 3. A flexible printing plate 4 having a pair of longitudinally extending edges 4A and a pair of transversely or circumferentially extending edges 4B is mounted on the clamping saddle 1. Along its longitudinal edges 4A the flexible printing plate 4 has a plurality of holes or slots 5 for securing the edge of the plate in position.

Spaced below the longitudinal edge 4A of the plate 4 is a clamping bar 7 which extends in spaced parallel relationship with the adjacent longitudinal edge 10A of the clamping saddle 1. Along its upper face the clamping bar 7 has a number of teeth or gripping members 6 arranged to register with the holes or slots 5 in the flexible printing plate for securing the plate in position on the clamping saddle. Two support arms 8 extend normally to the clamping bar and fit into slots 9 formed in the clamping saddle, see FIGS. 2 and 3. The width of the support arms 8 is less than the width of the slots affording a certain tolerance permitting the arms to be moved slightly in the direction of the longitudinal edge of the clamping saddle.

At the inner end of each slot 9 in the clamping saddle an elongated groove 11 extends perpendicularly to the slot and is in parallel relationship with the longitudinal edge 10A of the clamping saddle. A support member 12 is lo-

cated in each of these grooves and is positionable along the longitudinal axis of the groove by means of a threaded bolt 14 secured to the saddle and to the support member. A spring 15 is positioned in each of the grooves at the opposite side of the support member from the bolt 14. The spring 15 contacts the support member biasing it in the direction of the circumferentially extending edge 10B of the clamping saddle. The support member 12 has a support surface 13 in contact with and in parallel relationship with a support surface 8A on the support arm 8. These support surfaces 8A, 13 are disposed obliquely to the longitudinal edge of the clamping saddle, and further, each pair of contacting support surfaces along the longitudinal edge, with relationship to the other pair, are disposed in oppositely sloping directions with respect to the longitudinal edge.

In FIG. 6 another embodiment of the means for movably positioning the support members 12 is shown wherein a single screw 16 extends through the clamping saddle attached to both of the support members 12 along one longitudinal edge of the clamping saddle so that both of the members can be positioned simultaneously. This particular arrangement for moving the support members facilitates the mounting of the flexible plate on the clamping saddle. The screw 16 is guided in its axial direction by a slide member 17 positioned centrally within a groove 19 along the longitudinal direction of the clamping saddle. A pair of screws 18 extend longitudinally inward from the opposite circumferential edges 10B of the saddle into contact with the opposite surfaces of the slide member 17. This arrangement of the slide member 17 and the screws 18 is provided along each of the longitudinal edges 10A of the clamping saddle.

Depending on the direction of movement of the screws 18 and the corresponding movement of the slide member 17 and the screw 16 the longitudinal edges of the printing plate will assume an oblique disposition relative to the longitudinal edges of the saddle. For instance, in FIG. 6 if the screws 18 are moved to the right, the slide 17 and the screws 16 will also move to the right causing the clamping bar 7 and the longitudinal edge of the printing plate attached thereto to be disposed obliquely to the longitudinal edge of the saddle. In effect, the clamping bar pivots with its right end moving outwardly from and its left end moving inwardly toward the longitudinal edge of the saddle. Conversely, if the screws 18 are moved in the opposite direction, the clamping bar will pivot through a position where it is parallel to the longitudinal edge of the saddle and then assume an oblique disposition sloping in the opposite direction as the screws continue to move through to the left.

In assembling a flexible printing plate 4 in operating position on the printing press cylinder 2, the holes 5 along the longitudinal edges 4A of the plate 4 are fitted onto the gripping members 6 along the clamping bar 7. Initially for mounting the flexible plate in position, the support members 8 would be located closer to the center of the clamping saddle so that a certain tolerance is provided in securing the plate. With the plate secured on the gripping members of the clamping bar, the bar can then be disposed outwardly away from the clamping saddle to secure the flexible mounting plate tightly in position in the clamping saddle. Before the support members are finally positioned, however, the springs 15 in the groove force the support members in a position where a slight degree of tension is provided onto the support arms 8 so that the clamping bars are biased outwardly away from the longitudinal edges 10A of the clamping saddle. In the arrangement shown in FIG. 2, the bolts 14 are turned to move the support members 12 in the direction of the circumferential edges 10B of the saddle. As the support members move away from the longitudinal center of the saddle, the oblique disposition of their surfaces 13 urges the corresponding support surfaces 8A of the support arms 8 in

a direction normal to the longitudinal edge of the saddle 10A and provides a locking or clamping action as the flexible plate is drawn tightly onto the clamping saddle.

It is preferable in the assembly of the flexible plate onto the clamping saddle using the arrangement shown in FIG. 2 to tighten each of the bolts 14 at the same time so that an even tightening effect is achieved. However, if, because of improper registration of the flexible plate on the clamping saddle, it is desired to dispose it diagonally or at an angular disposition to the axis of the cylinder, one of the bolts would be tightened to a greater degree than the other until the desired registration is effected.

While in the drawing the support members are illustrated along only one of the longitudinal edges, it will be appreciated that a similar arrangement may be afforded on the opposite longitudinal edge for effectively securing and positioning the flexible printing plate in position.

As indicated previously, if the arrangement shown in FIG. 6 is used for tightening the flexible plate onto the saddle, the movement of screw or bolt 16 operates to position simultaneously both of the support members 12 and accordingly the bolts 16 along each of the longitudinal edges have the effect of tightening the plate as required.

It will be appreciated that the present invention provides not only an effective means for properly tightening the flexible plate on a clamping saddle but also provides for an angular disposition of the flexible plate with respect to the clamping saddle to take care of any misregistration which might be present because of the manner in which the flexible plate is formed.

What is claimed is:

1. A clamping device for securing a flexible printing plate on a rotary printing press comprising a clamping saddle having a pair of longitudinally extending edges and adapted to receive and support a flexible printing plate, a pair of movably positionable support members disposed within said saddle and located in spaced positions along one of the longitudinal edges of said saddle, each support member having a support surface directed outwardly and disposed at an oblique angle to said longitudinal edge, each support surface in said pair of support members disposed in an oppositely sloping direction with respect to said longitudinal edge, means for moving said support members in a direction parallel with said longitudinal edge, a clamping bar extending along said longitudinal edge of said clamping saddle, a pair of spaced support arms secured to said clamping bar and each arm extending therefrom into contacting engagement with one of said support members, each of said support arms having a support surface in contact with the opposed support surface on said support member, the support surfaces on said support arm in substantially parallel relationship with the support surface of said support member whereby, when the means for positioning said support members move said support members in a direction parallel to said longitudinal edge, the support arms are moved in a direction normal to said longitudinal edge.

2. A clamping device as set forth in claim 1, wherein

a pair of individual elongated grooves is formed in said clamping saddle and each groove is arranged to contain one of said support members, said grooves extending in the direction of the longitudinal edge of said clamping saddle.

3. A clamping device as set forth in claim 2, wherein a pair of slots is formed in said clamping saddle, each said slot extending from said longitudinal edge inwardly to one of said grooves, each of said slots arranged to receive one of said support arms of said clamping bar.

4. A clamping device as set forth in claim 3, wherein said slot has a width greater than the width of said support arm whereby said support arm can be displaced laterally within said slot.

5. A clamping device as set forth in claim 1, wherein said means for moving said support members comprises a pair of threaded bolts fitted into said clamping saddle and secured to said support members.

6. A clamping device as set forth in claim 5, wherein a spring member is positioned within said groove in contact with the surface of said groove at one end and with the opposite surface of said support member at its other end for urging said support member into contacting relationship with said support arm.

7. A clamping device as set forth in claim 1, wherein a single screw extends through said saddle along and adjacent the longitudinal edge thereof and is secured to both of said support members positioned along each said longitudinal edge for simultaneously positioning each of said support members.

8. A clamping device as set forth in claim 7, wherein a slide member is disposed intermediate the ends of said single screw for guiding it in the axial direction, and means for displacing said slide member in a direction parallel to the longitudinal edge of said clamping saddle.

9. A clamping device as set forth in claim 1, wherein said clamping bar is disposed outwardly from and in substantially parallel relationship with the longitudinal edge of said clamping saddle, and gripping members formed on the upper surface of said clamping bar and adapted to receive thereon openings formed in the edge of a flexible plate for securing the flexible plate in position on said clamping saddle.

10. A clamping device as set forth in claim 1, wherein each of said support arms extends perpendicularly from said clamping bar through one of said slots in said clamping saddle into contact with one of said support members.

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ROBERT E. PULFREY, Primary Examiner

CLIFFORD D. CROWDER, Assistant Examiner

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