United States Patent

[11] 3,587,464

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[21] Appl. No. **762,879**
[22] Filed **Sept. 26, 1968**
[45] Patented **June 28, 1971**

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[54] **SADDLE MOUNTING FOR FLEXIBLE THIN PRINTING PLATES**
1 Claim, 4 Drawing Figs.

[52] **U.S. Cl.** **101/415.1**
[51] **Int. Cl.** **B41f 27/14**
[50] **Field of Search** 101/415.1, 378, 383, 125; 51/358, 364, 380, 391, 392

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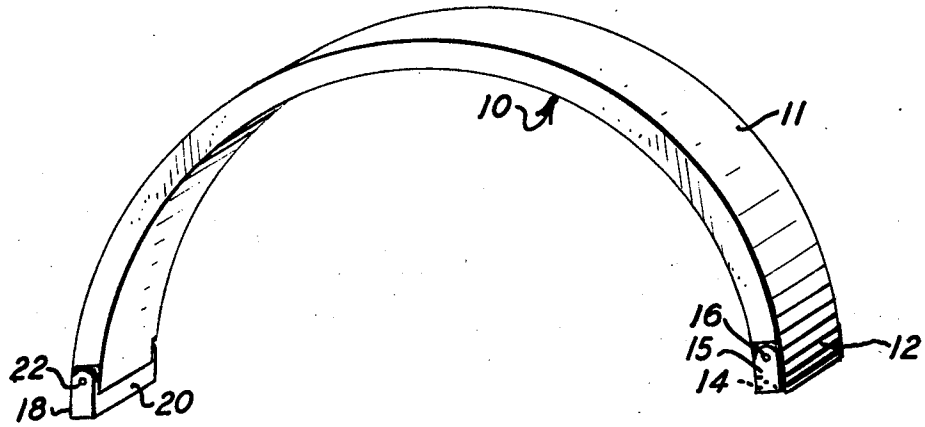
ABSTRACT: The invention disclosed is directed to a method and mounting means for detachably mounting flexible thin printing plates. The printing plates are detachably mounted to a backing plate or saddle by means of a printing plate securing member is association with a wedge-shaped element disposed on at least one terminal edge of the backing plate or saddle. The printing plate securing member is desirably pivotally mounted by arm members and includes an angularly disposed printing plate contacting surface for pressing a flexible thin printing plate against a mating edge of the wedge-shaped surface on at least one end of the saddle or backing plate.



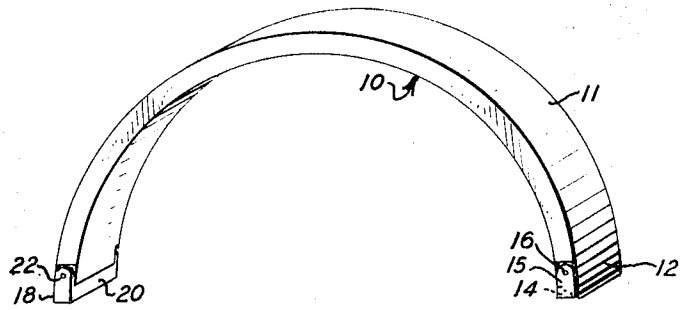


FIG. 1

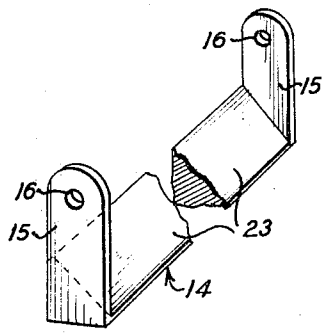


FIG. 2

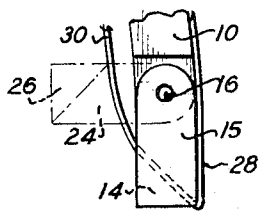


FIG. 3

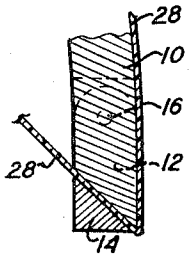


FIG. 4

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SADDLE MOUNTING FOR FLEXIBLE THIN PRINTING PLATES

This invention relates to a backing plate or saddle and to a method for detachably mounting flexible thin printing plates. More particularly, the present invention is directed to a saddle provided with a wedge-shaped element disposed on at least one terminal edge thereof for use in association with an angularly disposed plate contacting surface for pressing a flexible thin printing plate against a surface of the wedge-shaped element.

In the art of printing, especially in printing newspapers, it has been customary to use heavy printing plates such as those used for stereotype printing which are mounted detachably around the periphery of a solid cylinder. A known form of construction comprises a plurality of arcuately formed printing plates attached to a solid cylinder by means of a system of internal claws or clamping bolts. The printing cylinder commonly receives two plates, each occupying half the cylinder. It is important to be able to change the plates quickly, because with modern high speed operation a large quantity of printing is run off in a short time, following which the plates must be changed, and if plate change cannot be done quickly the down time of the printing press will be excessive.

A preferable and more convenient suggested method of forming a print surface comprises mounting a relatively thin plate, having a thickness of approximately 0.040 inches, for example, onto the surface of a cylinder. Such a plate may be readily produced as a plastic plate or by electrodeposition on a metal plate. It is, however, difficult and costly to make such plates thick enough to accommodate conventional internal clamping means. Considerable difficulties are thus presented in a satisfactory method of securing and tensioning a thin plate on to a cylinder without including undesirable zones of ineffective printing surface.

Since existing presses made for metal stereotype plates require relatively thick dimensions, adaption of such presses to thin flexible plate printing methods generates several problems. For example, it is necessary that the new system for the thin plates be formed so as to have substantially the same thickness as the normal metal stereotype plate in order to use existing presses and cylinders. Additionally, the plate must be easily adjusted to register true on the press. Furthermore, it is necessary that the plate be clampable by conventional existing means and be readily removable from the cylinder in the shortest possible time.

If a printing cylinder which is adapted for reception of stereotype plates, is to be mounted with a thin flexible printing plate instead of the normal thicker plates used in stereotype printing methods, a backing plate or saddle of sufficient thickness must be used in combination with the thin flexible printing plate such that the combined thickness essentially corresponds to the thickness of a standard stereotype plate. Moreover, the backing or saddle should be of sufficient rigidity to withstand the pressures generated by high speed printing.

One method of attaching a thin flexible printing plate to a saddle or backing plate is by adhesion of the printing plate thereto. This method, however, has a drawback in that the rigidity of the adhesive bond prevents subsequent registering and adjustment. Additionally, after use, removal of the printing plate from the saddle may cause damage to the saddle and/or the printing plate thereby curtailing their useful lives. Another drawback to adhesive mount of printing plates is the extended time necessary to remove the adhesive from the saddle after removal of the plate.

Another method of securing printing plates to saddles or backing plates is by use of either magnetic force or a vacuum means. Such systems, however, are complicated, of intricate design plate support, and typically preclude the use of stereotype printing plates on conventional printing press.

Another method of securing thin printing plates to saddles or backing plates adapted for stereotype printing presses is the use of a support adapted to engage thin printing plates by means of hooks and related mechanical elements. Such means have the general drawback that hooks and related elements must engage and may damage the printing plate and further, they typically prove inadequate in high speed printing operations. It has now been found that by the practice of the present invention there is provided a simple and efficient method and mounting means for detachably mounting flexible thin printing plates to a backing plate or saddle which overcomes many of the difficulties encountered heretofore in known prior art methods.

Generally stated, the present invention provides a backing plate or saddle for detachably mounting flexible thin printing plates by means of a printing plate securing member in association with a wedge-shaped element disposed on at least one terminal edge of the backing plate or saddle. The printing plate securing member is desirably pivotally mounted by arm members and includes an angularly disposed plate contacting surface for pressing a flexible thin printing plate against a mating edge of the wedge-shaped surface on at least one end of the saddle or backing plate.

The method of the present invention for mounting flexible thin printing plates broadly includes the steps of creasing a flexible thin printing plate along a line near at least one end thereof to be secured to a backing plate or saddle, aligning the crease in the printing plate with a wedge-shaped element disposed on at least on terminal edge of a backing plate or saddle, and retaining the crease in aligned position along said wedge-shaped element.

The flexible thin printing plates of this invention are generally characterized as having a section for mounting which maintains a crease when folded back upon itself with pressure applied to the fold. Thus, the body of the printing plate may be formed of most any flexible thin printing plate material provided that at least the ends of the plate to be mounted are characterized with the ability to retain a crease as described above. Specifically, the flexible thin printing plates may be composed of thin metal sheet of aluminum steel, copper, brass, a magnesium alloy, or the like; a polymeric or plastic material such as a synthetic organic resin or polymer; rubber; or the like.

The saddle or backing plate should be of sufficient thickness such that it is sufficiently stiff and does not flex to any appreciable degree when receiving a print plate or when mounted on a printing press. A saddle or plate thickness of at least about three-sixteenths inch to about three-eights inch usually is sufficient, whereas the flexible plates may have a total thickness in the range of about 10 to about 80 mils. The thickness of the saddle is chosen to complement the overall thickness of the printing plate such that the printing face is at a desired diametral height above the outer cylindrical surface of the printing cylinder. The saddle may be made of metals and alloys described above for the printing plate or hard, semirigid plastics such as phenol formaldehyde, acrylic, phenolic, nylon, and the like as well as other light weight materials. When light weight materials are used, the wedge members may be made of tougher, more wear resistant materials described above for the printing plate base.

The present invention is highly advantageous because it permits mounting of flexible printing plates onto printing presses using completely conventional printing cylinders, techniques and catches. The base saddle or backing plate is reuseable and the printing plate may be used for a production run, removed from the saddle, stored for any length of time and then remounted to the same or a different saddle to be run again at a later date. This invention permits a printer to maintain a minimum inventory of saddles and insures his ability to reuse any stable printing plate in the further.

It may also be recognized that the present invention provides a mounting means which is simple and rapidly manipulated without requiring complex printing plate positioning and tensioning elements. In addition, the present system does not require adhesives or the like thus eliminating difficulties associated with adhesive methods for mounting printing plates. Various other advantages and benefits of the present invention will readily appear hereinafter.

Although the saddle system described herein is operable for both rotary printing cylinders and flat bed presses, for purposes of explanation the specification description which follows will refer to arcuate saddles for rotary printing cylinders. Reference is now made to the drawings wherein similar reference numbers refer to similar parts throughout the various views:

FIG. 1 is a general perspective view of a saddle of the present invention for mounting on a printing cylinder;

FIG. 2 is a partially broken perspective view of the angularly disposed printing plate contacting surface attachable to at least one terminal end of a saddle;

FIG. 3 is a partial right side elevation view illustrating a method of attaching a printing plate to a saddle.

FIG. 4 is a partial right side elevational and cross-sectional view of FIG. 3 further illustrating a method of attaching a printing plate to a saddle.

Referring to the drawing, FIG. 1—4 illustrates saddle **10** having at least one wedge-shaped element **12** formed as one terminal edge thereof. Desirably, the outer arcuate surface **11** of saddle **12** terminates as the apex of the wedge which then includes a wedge surface disposed at an angle such as about 30° to about 75° to the horizontal. The apex of the wedge is that sufficient to retain a flexible thin printing plate in place under low or minimal tension when positioned along the outer arcuate surface of the saddle.

In association with wedge-shaped element **12**, there is included printing plate retaining member **14** having arms **15** perpendicularly projecting therefrom for retention by hole **16** to the saddle by any suitable means such as a pin, screw, nail or the like. Printing plate retaining member may be coated along the printing plate engaging surface, if desired, with a nonslip material for the printing plate layer, may be knurled, or other configurated to further aid in retaining the printing plate in position on the saddle. In addition, snap-unsnap looking means may be included in arms **15** or otherwise relative to printing plate retaining surface **14** for limiting or restricting pivotal movement when a printing plate is held in position as described hereinafter. If desired, arms **15** may be formed such that when in closed position, the outer configuration thereof is essentially that of the side edges of a saddle removed to provide a location for positioning the arm members. By providing the arm members with such a configuration, the saddle may move easily and accurately be positioned on a printing cylinder where close tolerances may be important.

Oppositely disposed to wedge-shaped element **12** on saddle **10** may appear, substantially as a mirror image of wedge-shaped element **12**, wedge-shaped element **18** for use in association with printing plate retaining member **20**. Printing plate retaining member **20** having arms **18** is similarly constructed for operation as is printing plate retaining member **14** and therefore will be discussed merely as the latter member hereinafter.

FIG. 2 further illustrates printing plate retaining member **14** having angularly disposed printing plate engaging surface **23**. Surface **23** is angularly disposed to the horizontal and is a mating angle to that of the wedging surface formed as terminal end **12** of saddle **10**.

The method of the present invention becomes more apparent from the illustrations of FIGS. 3—4. Initially, printing plate retaining member **14** is pivoted on arms **15** to occupy positions **26** and **24** respectively. A printing plate, appearing as a flat thin sheet is creased at two lines such that the distance between the two creases is slightly less than the arcuate distance of the saddle from wedge apex to wedge apex. The printing plate may be creased manually, by using a separate creasing device, or by creasing means in association with the saddle as desired.

When mounting the thin printing plate creased as indicated in position about the outer surface of the saddle, the creases when in position on the apex of the wedge causes the printing plate to be retained under low or minimal tension. This mounting method permits the printing plate to be firmly held in tight position about the outer surface of the saddle.

After the printing plate has been properly creased and positioned along the wedge apex, it appears as printing plate **28** about the surface of saddle **10** with surplus printing plate **30** merely hanging loose as illustrated. It is recognized that the surplus portion of the printing plate may be trimmed and removed if desired. Thereafter, printing plate retaining member **26** is returned to normal position of printing plate retaining member **14** to retain the printing plate from slipping out of the wedge apex position. It becomes thus apparent that the printing plate is retained in position by creases disposed near the ends thereof by the wedge apex of, for example, wedge-shaped element **12**. Printing plate retaining member **14** usefully serves to retain the printing plate in position by preventing disengagement of the crease with the wedge apex. The final position of the elements is that illustrated in FIG. 4.

It is apparent that a great number of differently shaped printing plate retaining members may be designed to perform the function of that generally illustrated for simplicity in the drawing. In addition, various means may be included for mounting the printing plate retaining member to a saddle and it is possible that the elements may be formed directly in the saddle as desired.

Although it is desirable that the wedge-shaped elements appear at both ends of the saddle, it is recognized that only one such member need be included with other means used to secure the opposite side of the printing plate as desired. The formed ends of the printing plate hold in intimate contact with the ends of the saddle and the low or minimal tension developed in the relatively flexible printing plate will cause it to lie snugly against the outer arcuate surface of the saddle. The printing plate and the saddle are now an integral assembly and may be locked to a printing press cylinder in a conventional manner.

The assembled printing plate and saddle may be fastened onto the printing cylinder by means of conventional clamping blocks or hooks known to the art. Suitable slots may be made on the inner arcuate surface and at each end of the saddle to permit the use of tension lockup catches to assist in holding the saddle and the printing plate on the cylinder or flat bed. The saddle may be also used on printing presses equipped with margin bars in place of one or more of the standard catches. All moving parts may be made of wear resistant materials, thus insuring a long life. Since many printers prefer light materials, which may be more susceptible to damage, the wedge elements may be made of hard materials and be removed from a worn or damage saddle and reinstalled in a replacement saddle, thus minimizing costs. Finally, the printing plate is supported on a continuous, one piece uninterrupted surface assuring maximum printing quality.

The various elements of the present apparatus unless otherwise indicated, may be secured to adjoining elements by any suitable means such as bolts, welding, rivets or the like. In addition, auxiliary support or reinforcement members may also be included as part of the apparatus where required.

Although a preferred embodiment of the invention has been illustrated herein, it is to be understood that various changes and modifications may be made in the construction and arrangement of elements without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A saddle for detachably mounting a flexible thin printing plate which comprises in combination, a saddle of unitary construction having an upper surface, an under surface and two opposite side surfaces, said upper surface for supporting a flexible thin printing plate thereon, two generally V wedge-shaped elements disposed on each terminal opposite edge of the saddle, a first leg of each of said wedge-shaped elements disposed as the upper saddle surface with the apex of the said V forming the terminal edges of the saddle, a second leg of each of said wedge-shaped elements extending to the under surface of the saddle at an acute angle relative to the first leg, said leg elements appearing as substantially flat surfaces between the opposite side surfaces of the saddle, a printing

plate securing member having a body portion and substanting parallel arm members similarly disposed at two opposite ends of the body portion and pivoted to each of said opposite side surfaces of the saddle with pivotal movement limited to the under surface of the saddle, said body portion having a surface for making contact with the second leg forming the terminal edges of the saddle, a flexible thin printing plate having crease lines near opposite ends thereof and a thickness in the range of about 10 to about 80 mils, said printing plate disposed over the upper saddle surface and maintained thereon by contact of the crease lines with each apex of the said V wedge-shaped elements, said printing plate secured to the saddle by engagement between the body portion of the said securing member and the second leg of the V wedge-shaped elements.