United States Patent

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[54] **MOUNTING FOR THIN PRINTING PLATES**

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[73] Assignee: **W. R. Grace & Co.**, New York, N.Y.

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[52] **U.S. Cl.** **101/415.1**, 74/110, 101/378, 402/69

[51] **Int. Cl.** **B41f 1/36**

[58] **Field of Search**.....101/415.1, 378, 383, 128.1; 402/33, 54, 66, 69; 74/110

[56] **References Cited**

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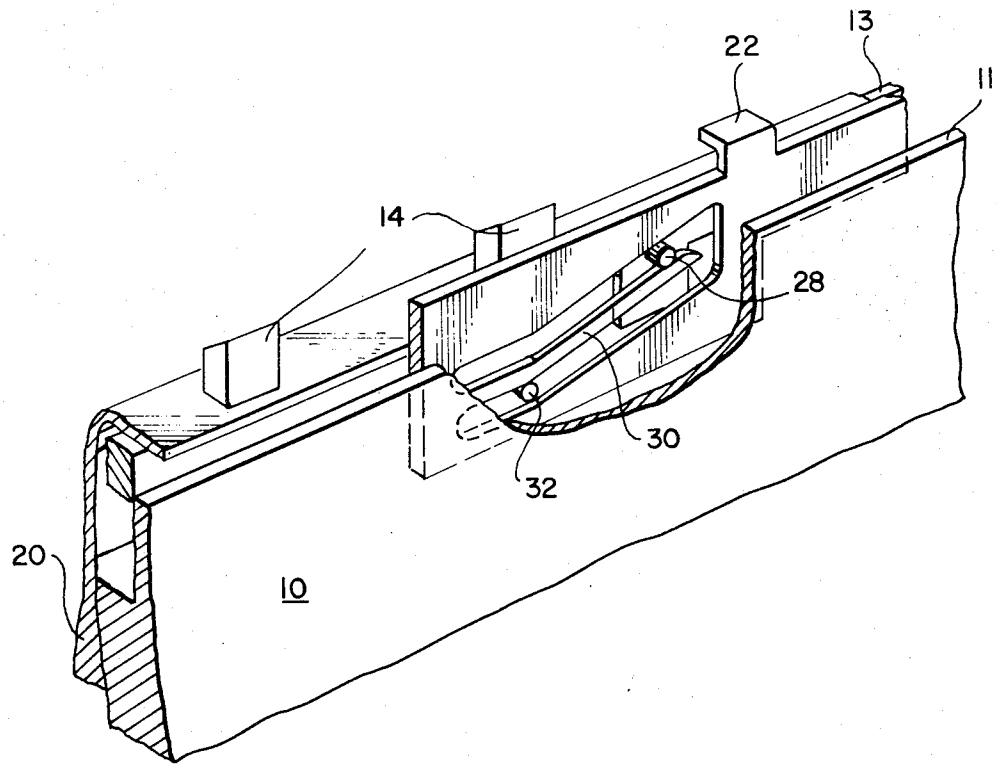
[57] **ABSTRACT**

The invention disclosed is directed to a mounting means for detachably mounting flexible thin printing plates. Printing plates are detachably mounted on at least one terminal edge of the backing plate or saddle by means of a studded plate securing bar which is spring biased by a slidable bar positioning element. The co-action of the positioning element and the securing bar both disposed within the thickners of the backing plate or saddle provides an efficient highly acceptable means for securing a thin printing plate in position.

4 Claims, 6 Drawing Figures



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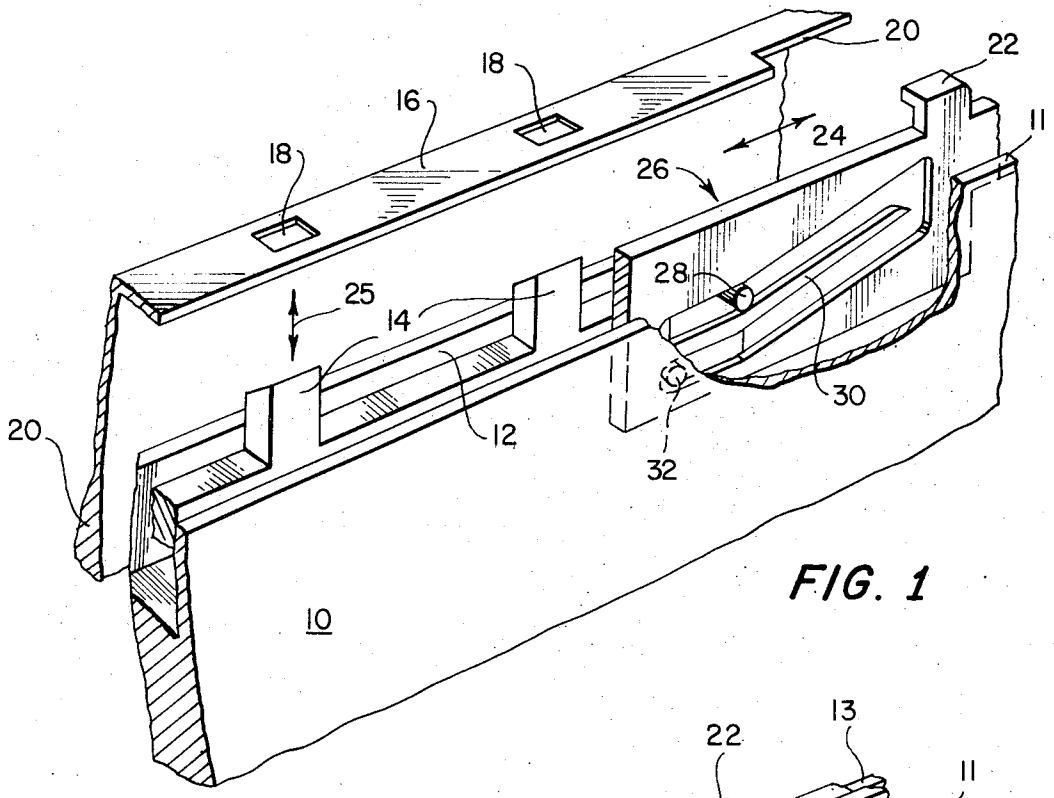

FIG. 1

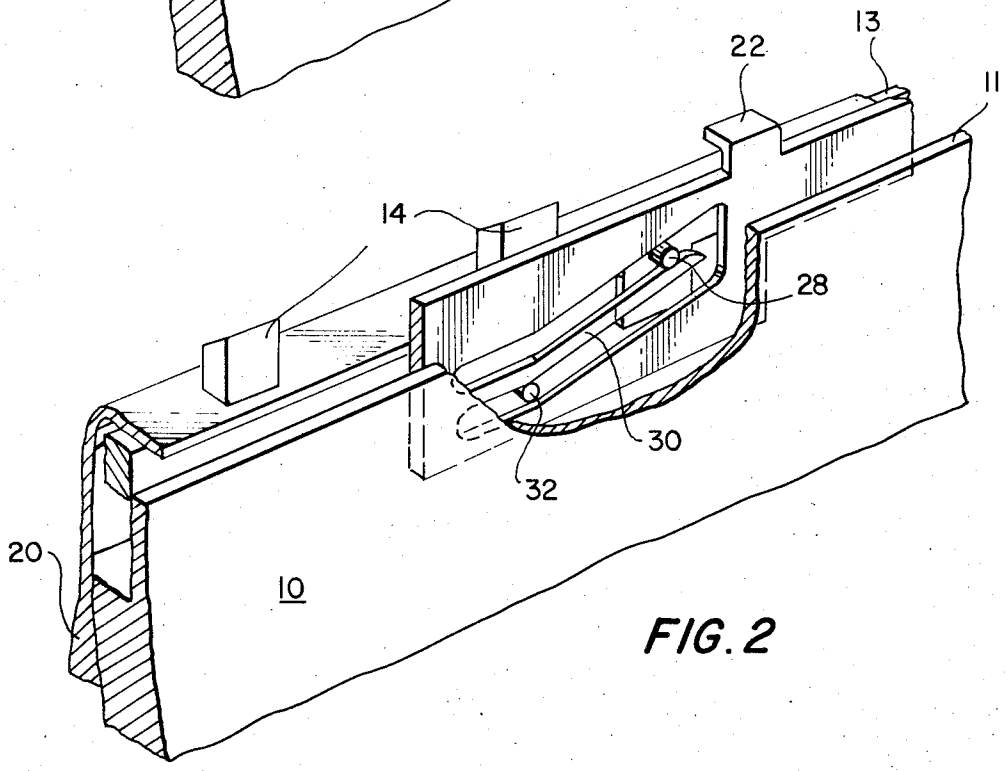

FIG. 2

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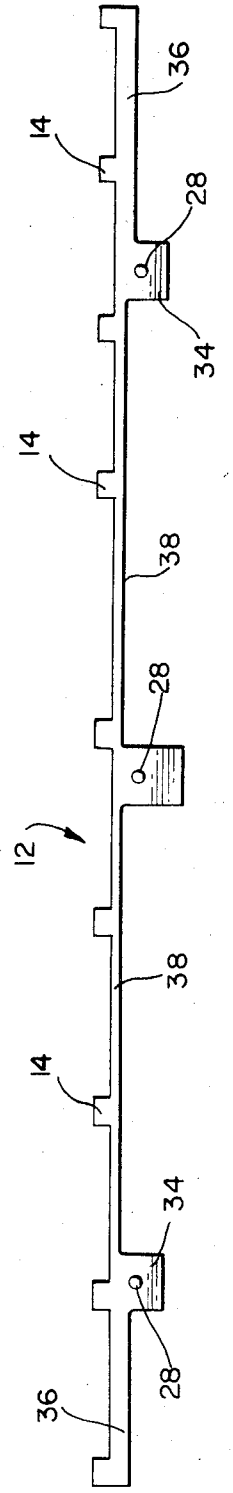

FIG. 3

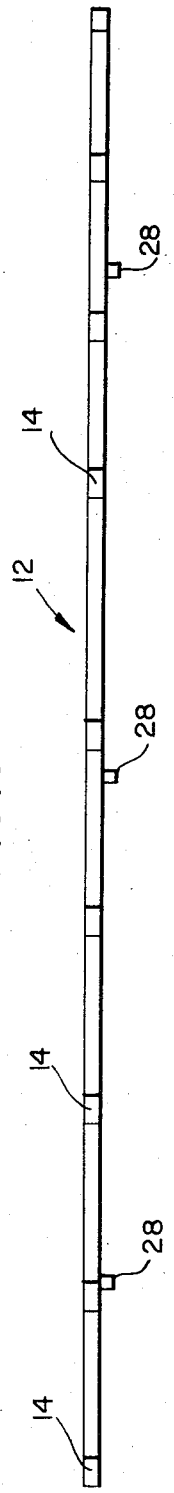

FIG. 4

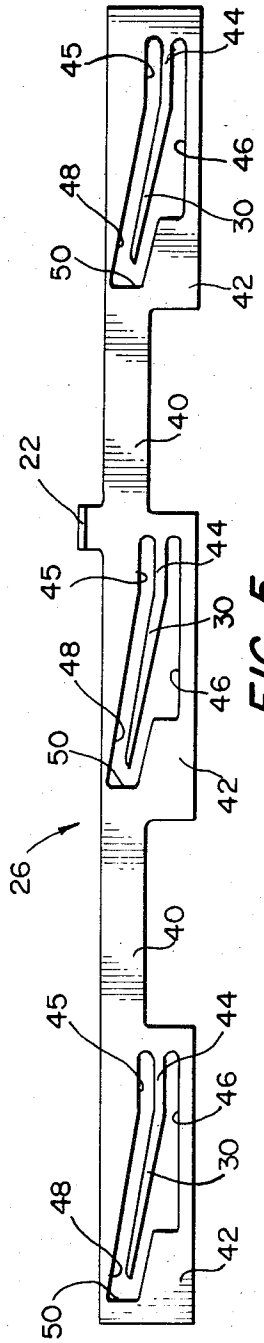

FIG. 5

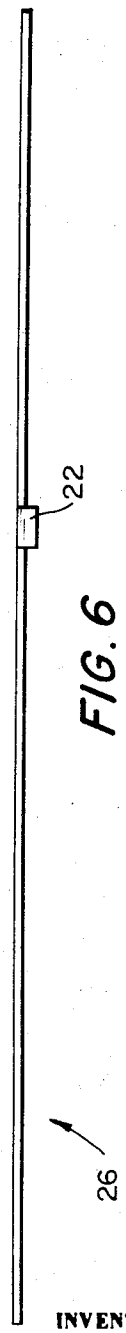

FIG. 6

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MOUNTING FOR THIN PRINTING PLATES

This invention relates to a backing plate plate or saddle for detachably mounting flexible thin printing plates. More particularly, the present invention is directed to a saddle provided with a studded plate securing bar which is spring biased by a slidable bar positioning element. Co-action of the positioning element and the securing bar both disposed within the thickners of the saddle provides the means for securing a flexible thin printing plate under tension against a surface of the saddle.

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 printing surface comprises mounting a relatively thin plate, having a thickness of approximately .030 inch, for example, onto the surface of a cylinder. Such a plate may be readily produced as a plastic plate or by electro-deposition 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 mounting 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.

Generally stated, the present invention provides a backing plate or saddle for detachably mounting flexible thin printing plate by means of a studded plate securing bar which is spring biased by a slidable bar positioning element. The studded plate securing bar engages slots near the edge of the printing plate for mounting the plate under tension against an upper surface of the saddle.

The flexible thin printing plates of this invention are generally characterized as having a section for mounting which maintains contact with the studded members. Thus, the body or backing 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 contact without rupture. 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; hard or semi-rigid 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 printing plate or when mounted on a printing press. A saddle or plate thickness of at least about 3/16 inch to about 7/16 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, semi-rigid plastics such as phenol formaldehyde, acrylic, phenolic, nylon, and the like as well as other light weight materials.

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 thus permits a printer to maintain a minimum inventory of saddles and insures his ability to reuse any stable printing plate in the future.

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 arculate 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 broken partial perspective view of the present mounting means on a saddle illustrated receiving a printing plate;

FIG. 2 is a broken partial perspective view of the present mounting means with printing plate in engaged position;

FIG. 3 is a front elevational view of the studded plate securing bar of the present mounting means;

FIG. 4 is a top view of the securing bar of FIG. 3;

FIG. 5 is a front elevational view of the slidable bar positioning element of the present mounting means; and FIG. 6 is a top view of the element illustrated in FIG. 5.

Referring to the drawings, FIGS. 1–2 illustrate a portion of saddle 10 having a section removed along the edge of the thickness thereof and forming side walls 11 and 13 for receiving studded plate securing bar 12. Securing bar 12 is provided with integral studded members 14 formed as a rectangular cross-section and illustrated with a slightly tapered upper section for receiving a flexible thin printing plate backing 16 by way of slots 18. Other configurations for members 14 may be as desired. Slots 18 are disposed near the edge of the printing plate and desirably within a creased terminal portion thereof. The printing plate backing or support sheet 16 includes a printing surface 20 formed of suitable materials as desired. Within the creased terminal portion of plate 16 there also appears a removed rectangular section 18 permitting L-shaped bar 22 to freely move within the removed section 21 in the direction of arrow 24. L-shaped bar 22 is disposed integrally to slidable bar positioning element 26 having an area described subsequently for receiving pin 28 along cantilever 30 for movement of securing bar 12 in the direction of arrow 25. A further portion of the positioning element 26 permits limited movement in the direction of arrow 24 by fixed pin 32 within walls leveler 13.

FIG. 2 further illustrates the printing plate when secured in position under tension by securing bar 12 with pin 28 appearing near the edge of cantilever 30 which spring biases securing bar 12 and thereby provides the necessary tension to backing plate 16 for maintaining the printing plate along a surface of saddle 10.

The securing means illustrated in FIG. 1–2 may appear on only one side of a saddle although in practice, the securing means are disposed on either side of a printing plate to be held in position.

FIG. 3–4 illustrate in greater detail construction of studded plate securing bar 12. Securing bar 12 in addition to elements described previously is desirably formed from a thin plate with body members 36 constructed slightly greater in size than internal members 28. Pin engaging surfaces 34 are formed integral with the securing bar and receive pins 28 which engage with the cantilever member 38 as illustrated in FIGS. 1–2.

FIGS. 5–6 illustrate in greater detail slidable bar positioning element 26. This bar positioning element is formed of a metal plate having a body portion 40 and cantilever housing 42 disposed in any convenient number and especially three such as illustrated. Cantilever housing 42 includes a horizontal cantilever portion 44 from which slightly elevated cantilever 13 projects. Also disposed within cantilever housing 42 is a horizontal slot 46 for receiving permanently fixed pin 32 disposed within side walls 11 and 13. Horizontal slot 46 thereby permits bar positioning element 26 to slide in a horizontal direction a length depending upon the cut-out size. Housing 42 also includes an upper tapering surface 48 from substantially horizontally configurated surface 45. Surface 48 joins with a vertical end surface 50 to form an area for free movement of cantilever 30 therein.

In construction, bar element 26 is joined by pins 28 along the upper surface of cantilever 30. Next, these two elements are disposed within the cut-out edge of the saddle and pin 32 is secured through the cut-out within slot 46. Thus, element 26 may slide in a horizontal direction by movement of L-shaped bar 22 with movement limited within slot 46. The positioning and configuration of cantilever 30 upon movement of element 26 in the direction of arrow 24 causes pins 28 to move bar 12 in the direction of arrow 25. Element 26 being constructed of metal which permits cantilever 30 to be characterized with a spring biasing effect, also causes bar 12 to be spring biased, thereby providing a tension engaging means for plate 16 when slot 18 receives studded member 14. The co-action of positioning element 26 and securing bar 12 both disposed within the thickness of the saddle provides an efficient and highly acceptable means for securing printing plate 16 in position on saddle 10.

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 members to the saddle and it is possible that some of the elements may be formed directly as part of the saddle as desired.

Although it is desirable that the present securing means appear at both ends of the saddle, it is recognized that only one such means 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 necessary tension developed will cause the printing plate 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 ten-

sion 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 elements of the present means may be made of hard materials and be removed from a worn or damaged 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.

What is claimed is:

1. A means for mounting flexible thin plates which comprises in combination, a studded plate securing bar, a slidable bar positioning element, and cantilever spring element means disposed within the body of the slidable bar positioning element, said studded plate securing bar having stud means for engaging slots disposed near the terminal edge of the plate for mounting the plate under tension derived from said cantilever spring element means.

2. The means of claim 1 disposed within at least one removed edge portion of a saddle.

3. The means of claim 1 wherein three cantilever means are provided within the slidable bar positioning element.

4. The means of claim 1 wherein the slidable bar positioning element moves in a horizontal direction and wherein the studded plate securing bar moves in a vertical direction.

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