

[54] **METHOD OF FASTENING A PRINTING PLATE ON A CYLINDER IN A PRINTING PRESS AND DEVICE FOR SAID FASTENING**

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**Related U.S. Application Data**

[63] Continuation of Ser. No. 269,703, July 7, 1972, abandoned.

[30] **Foreign Application Priority Data**

July 12, 1971 Sweden..... 9012/71

[52] **U.S. Cl.**..... 101/415.1; 101/426

[51] **Int. Cl.**..... B41f 27/12

[58] **Field of Search**..... 101/415.1, 378, 426

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[57]

**ABSTRACT**

Method and apparatus for fastening a printing plate to the plate cylinder of a printing press. One edge of the printing plate is positioned against a pair of projections provided as part of a clamping assembly for clamping the aforementioned edge. The printing plate is substantially wrapped about a plate cylinder and the opposite edge is coupled to a second clamping assembly which in turn is provided with a pivot pin having an arm pivotally mounted thereto. The arm is provided with a roller which rollingly engages the sidewall of a recess provided in the printing cylinder. A first wedge shaped member is threadingly engaged by a threaded fastener which is secured to the second clamping assembly. A second wedge shaped member slidably engages the first wedge shaped member and moves away from the first wedge shaped member as the aforesaid threaded fastener is tightened thereby causing the pivotal arm to rotate about the axis of the roller member to draw the printing plate more tightly about the printing cylinder. Thus the printing plate is secured by three triangularly positioned points two of which are stationary and the third of which is movable to automatically compensate for any sidewise movement of the printing plate.

**3 Claims, 4 Drawing Figures**

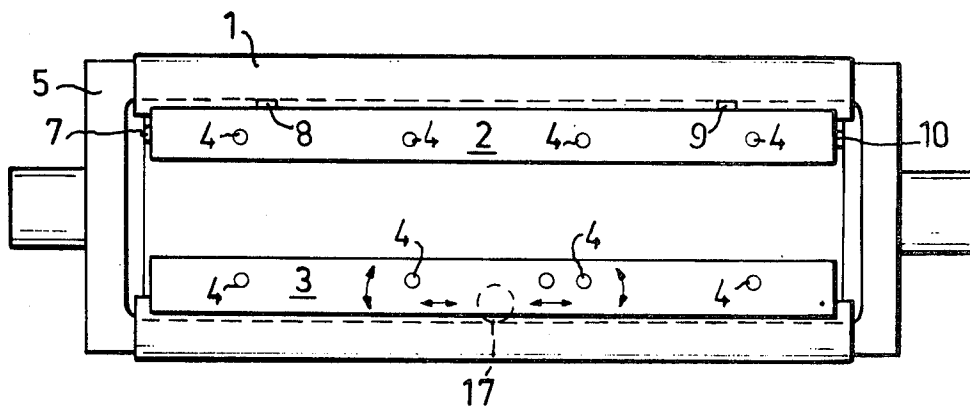


FIG. 1

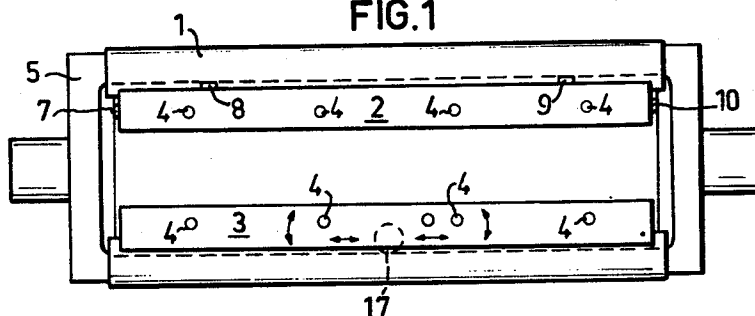


FIG. 4

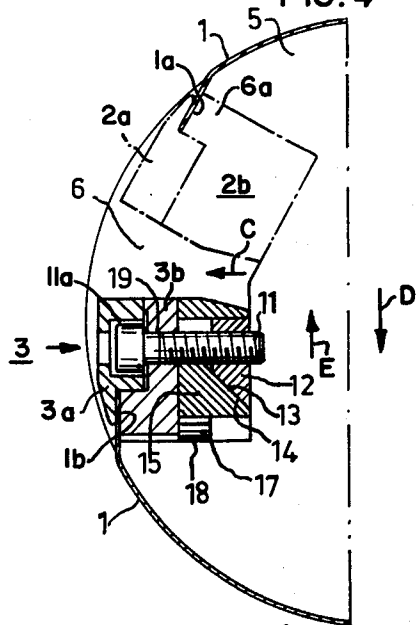


FIG. 3

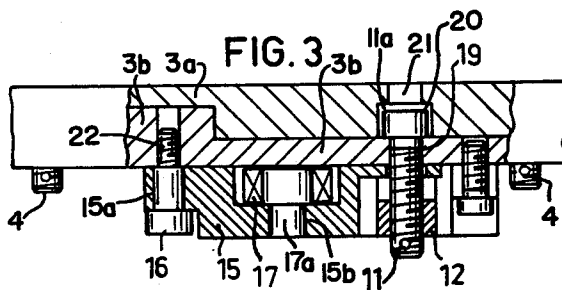
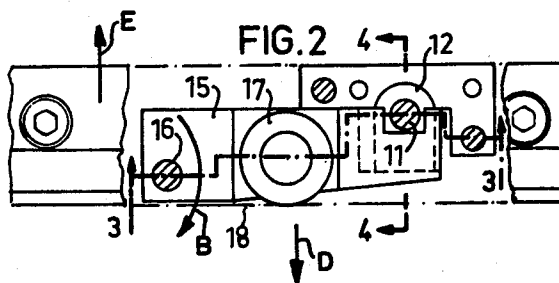


FIG. 2



# METHOD OF FASTENING A PRINTING PLATE ON A CYLINDER IN A PRINTING PRESS AND DEVICE FOR SAID FASTENING

This is a continuation of application Ser. No. 269,703, filed July 7, 1972, now abandoned.

Offset printing is done from a plate which is fastened on a printing roller, and from which the impression is transferred via a rubber roller to the paper.

For a correct fit the tightening of the plate is very important. The register is adjusted to the front edge of the plate with adjusting screws and various means, but there must be a perfect register over the whole surface of the plate. Especially in colour printing even the smallest error in alignment is clearly visible from a consideration of the product printed from the plate.

The tightening of the plate must be done with an even tension over the whole plate surface, so that blistering or buckling does not occur, but at the same time the tension must not be so great that the plate is stretched at any point, especially in zinc plates; or splits, as easily occurs with aluminium plates. The forces which occur in printing are relatively great and the plate is subjected to a constant mangling which tends to pull the picture backwards.

For mounting the plate in the press there are two elongated members typically referred to as rulers which are located in an axial channel in the surface of the plate cylinder. The plate is fastened on these rulers with a number of screws in a known manner. In order to get the required even plate tension one has then previously had a number of turnbuckles with possibilities of adjustment in each ruler, whereby it became possible to stretch the plate locally more or less at various places. Another method of obtaining even tension in the plate has been to mount a large number of springs between the rear ruler and the plate cylinder, which springs even out the differences in tension in the various parts of the plate for obtaining an even tension. By fastening the plate on top of springs the plate has also a certain lateral mobility at its rear edge.

The present invention relates to a completely new method of achieving the even tension and stretching of the plate without time-consuming adjustment with a large number of turnbuckles which were previously required or a tightening which is not completely satisfactory, which is obtained with springs between the rear ruler and the cylinder.

The invention is characterized in that the plate is tightened at three triangularly positioned points, and that the device for tightening of the rear edge consists of a bearing which can roll freely against the rear edge of the cylinder channel.

The construction will be more closely described in the form of an example according to the enclosed drawing in which

FIG. 1 shows a top view of a printing plate cylinder embodying the principles of the present invention.

FIG. 2 shows a detailed view of a portion of the printing plate mounting assembly of FIG. 1 wherein one of the ruler members has been sectionalized to facilitate observation of the components positioned therebeneath;

FIG. 3 shows a sectional view of the structure of FIG. 2 looking in the direction of arrows 3—3; and

FIG. 4 shows an end view of the structure of FIG. 2 looking in the direction of arrows 4—4.

FIG. 1 shows a plate 1 fastened to ruler assemblies 2 and 3. The front ruler assembly is comprised of two elongated members 2a and 2b secured to one another by screws 4 to clamp the front edge 1a of plate 1 therebetween, as shown best in FIG. 4. The member 2b is provided with projections 8 and 9, as shown best in FIG. 1, which rest against one edge 6a of the channel 6 provided in the printing plate cylinder 5. The projections 8 and 9 abut against edge 6. Cylinder 5 is provided with side edges 7 and 10 which engage the ends of ruler assembly 2 to prevent lateral movement of assembly 2 and hence plate 1. Thus, the front edge 1a of printing plate 1 is effectively secured at two points 8 and 9.

After the front edge of the plate has been secured to ruler assembly 2 in the manner set forth hereinabove, the plate is stretched about printing plate cylinder 5 and its rear edge 1b is positioned between ruler assembly 3 comprised of rigid members 3a and 3b secured to one another by screws 4. The printing plate is firmly and uniformly stretched about printing plate cylinder 5 by the adjustment of an adjustable screw 11 which extends through untapped opening 19 in ruler member 3b. The head 11a of adjustable screw 11 is positioned within a cavity 20 provided in member 3a. This cavity communicates with an opening 21 in member 3a so as to permit insertion of the head of a screw driver, for example, for rotating and hence adjusting adjustable screw 11. Screw 11 threadedly engages a tapped opening provided in a wedge-shaped member 12 which has a wedge surface 13 in slidable engagement with a corresponding wedge surface 14 provided on a pivotally mounted arm 15. Arm 15 is swingably mounted about a pivot point comprised of bolt 16 which extends through an untapped opening 15a in arm 15 and which threadedly engages a tapped opening 22 in member 3b. Considering FIG. 2, arm 15 may be caused to rotate in the clockwise direction as shown by arrow B which clockwise rotation occurs in a manner to be more fully described hereinbelow.

Member 15 is further provided with a cavity 15a for receiving a bearing 17 mounted to a shaft 17a which is fixedly secured within an opening 15b which communicates with cavity 15a, as shown best in FIG. 3. Bearing 17 is free-wheelingly mounted about shaft 17a and has a portion of its periphery engaging the side wall 18 of channel 6 provided in the printing plate cylinder 5.

By tightening the screw 11, wedge-shaped member 12 is urged in the direction shown by arrow C of FIG. 4, causing arm 15 to rotate in the clockwise direction B (FIG. 2) which urges bearing 17 downwardly, as shown by arrow D of FIGS. 2 and 4, against the side wall 18 of channel 6. This, in turn, moves ruler assembly 3 in the upward direction, as shown by arrow E of FIGS. 2 and 4, so as to tightly wrap the printing plate 1 about cylinder 5.

The plate 1 is thereby fixed at three points, namely points 8, 9 and 17 and since the friction of the needle bearing 17 is so small, the ruler assembly 3 is free to move in the lateral direction during the stretching of the plate so that any oblique tensions which may occur are eliminated.

The side wall 18 of channel 6 opposes the pulling pressure applied to side wall 18 by the tightening of plate 1. Since there is minimal frictional resistance between bearing 17 and side wall 18, bearing 17 may roll freely along side wall 18 if oblique tensions exist in the

plate and thereby balance such tensions out. For example, considering FIG. 2, if the tensions imposed by plate 1 upon the ruler assembly 3 are greater to the left of bearing 17 (relative to FIG. 2) the ruler assembly 3 will pivot clockwise about the bearing 17 and bearing 17 will thereby be free to move laterally to balance the unequal tensions applied upon arm 15. Conversely, if the tensions applied by the printing plate 1 upon ruler assembly 3 and to the right of bearing 17 are greater than the tension applied to ruler assembly 3 to the left of bearing 17, then bearing 17 is again free to move laterally to balance these unequal tensions. The pressures developed between bearing 17 and side wall 18 are relatively high and it has been shown that with the small bearing dimensions employed herein, the best results are achieved by using needle bearings.

What is claimed is:

1. A method for fastening a printing plate to a printing plate cylinder in a printing press at three spaced points, said three points defining a triangle comprising the steps of:

affixing a first marginal edge of the printing plate to a ruler assembly;  
 providing a channel in the printing plate cylinder having first and second spaced parallel side walls;  
 providing two projections along said ruler assembly, said two projections abutting against said first side wall of said channel;  
 wrapping said printing plate around the cylinder and securing the opposite marginal edge of said printing plate to a second ruler assembly;  
 swingably mounting the first end of an arm to said second ruler assembly;  
 providing a rollable bearing upon said swing arm at a point intermediate the ends of said swing arm;  
 providing a wedging surface at the free end of said swing arm;  
 positioning the surface of a wedge member against the wedge surface provided at the free end of said swing arm;  
 positioning said second ruler assembly in said channel with said bearing resting against said second side wall;  
 moving said wedge member toward said swingable arm by means of a screw to rotate said swing arm about its pivot point thereby urging the bearing of said swing arm against the remaining side wall of said channel causing the second ruler assembly to move away from said second side wall, and thereby tightening said printing plate about said printing plate cylinder, said rollable bearing being the third point of contact of said printing plate with said printing cylinder, whereby said rollable bearing is

free to move laterally in order to relieve uneven tensions applied by said printing plate to the second ruler assembly.

2. Apparatus for uniformly tightening a thin printing plate on a plate cylinder in a printing press, said cylinder having a channel extending the length of said cylinder, said channel having first and second spaced side wall portions;

a first elongated ruler assembly;

means for securing one marginal edge of said printing plate to said first ruler assembly;

one edge of said first ruler assembly having first and second spaced projections being positioned to bear against said first side wall;

a second ruler assembly for securing the remaining marginal edge of said plate;

an arm having a first end pivotally secured to said second ruler assembly;

the free end of said arm having a wedge-shaped cross-section to provide a first wedge surface;

a wedge member being positioned to have one surface thereof in sliding engagement with said first wedge surface;

said wedge member having a tapped aperture; a screw member threadedly engaging said tapped aperture; said second ruler assembly having an opening in alignment with the tapped aperture in said wedge member;

a rollable bearing mounted on said arm intermediate its ends;

said bearing being positioned to rollingly engage said second side wall;

said wedge member being adapted to swing the free end of said swing arm toward said second side wall when said screw member is tightened to urge the wedge member toward the second ruler assembly and move the bearing toward the second side wall causing said second ruler assembly to move away from said second side wall;

said bearing being the only contact between said second side wall and said second ruler assembly whereby said plate is secured to said cylinder at only three points, said first and second projections constituting two of said three points and said bearing being the third point, whereby the rolling engagement between said bearing and said second side wall permits lateral movement of said second ruler assembly to assure the application of uniform tension upon said plate by said first and second ruler assemblies.

3. The apparatus of claim 2 wherein said bearing is a needle bearing.

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