United States Patent [19]

Parsley

[11] **3,874,292**

[45] **Apr. 1, 1975**

[54] **PLATE CLAMP**

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[73] Assignee: **Dahlgren Manufacturing Company, Inc.**, Dallas, Tex.

[22] Filed: **Sept. 17, 1973**

[21] Appl. No.: **397,898**

[52] **U.S. Cl.** **101/415.1**, 101/378, 101/382

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

[58] **Field of Search** 101/415.1, 378, 382, 331, 101/379

[56] **References Cited**

UNITED STATES PATENTS

2,236,230	3/1941	Worthington	101/415.1 X
3,335,663	8/1967	Harenza	101/415.1
3,382,799	5/1968	Luers	101/415.1
3,727,551	4/1973	Kostas et al.	101/415.1
3,766,857	10/1973	Schlatter	101/415.1

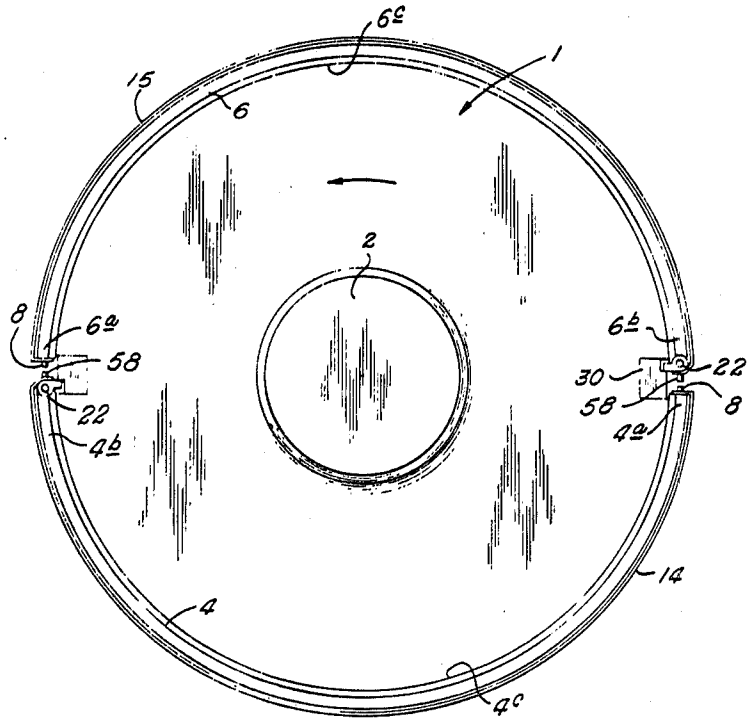
Primary Examiner—Stephen C. Pellegrino

Attorney, Agent, or Firm—Howard E. Moore; Gerald G. Crutsinger

[57] **ABSTRACT**

A plate clamp to detachably secure a printing plate on a plate cylinder of a printing press comprising a row of spaced pegs positionable through spaced apertures formed adjacent the leading edge of a printing plate, and a row of spaced pins secured to a shaft mounted for rotation to position the pins through apertures formed adjacent the trailing edge of the plate. The shaft is urged by a spring to a position wherein the plate is positively located and tightly drawn about a portion of the circumference of the plate cylinder.

6 Claims, 9 Drawing Figures



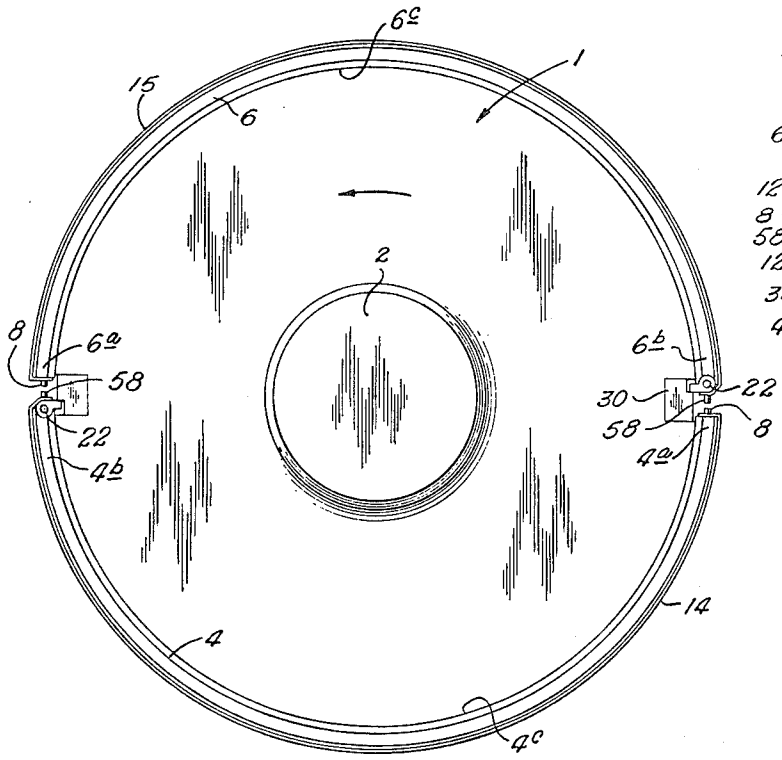


Fig. I

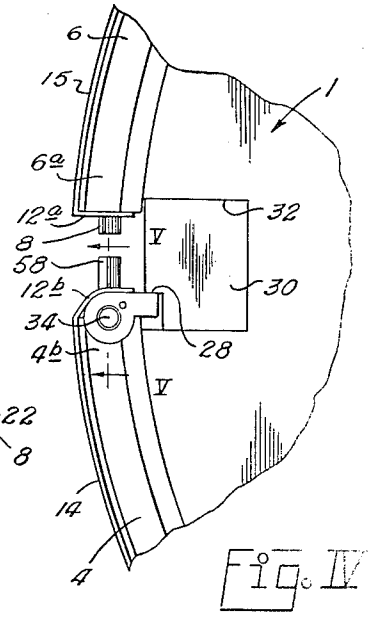


Fig. IV

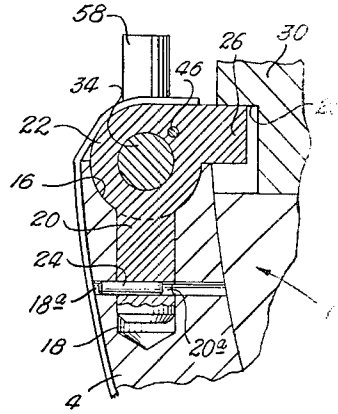


Fig. VI

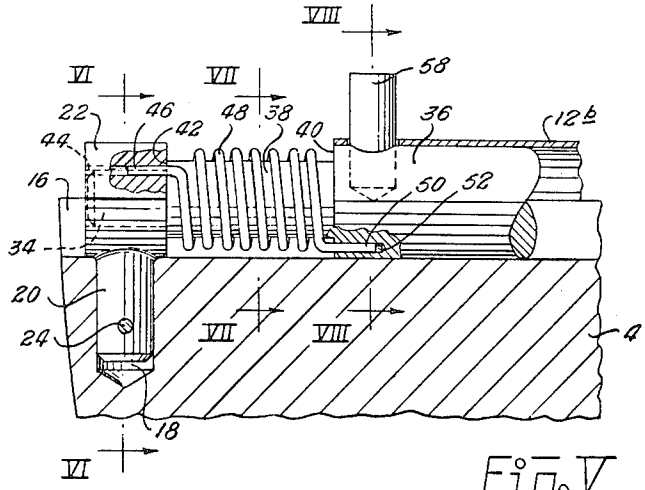


Fig. V

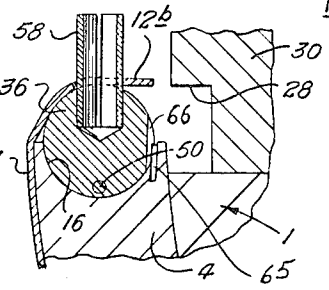


Fig. VIII

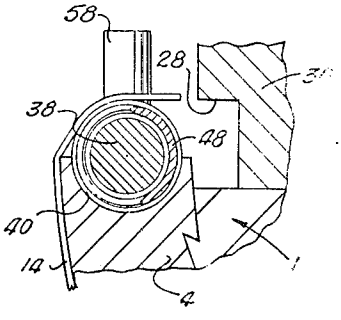


Fig. VII

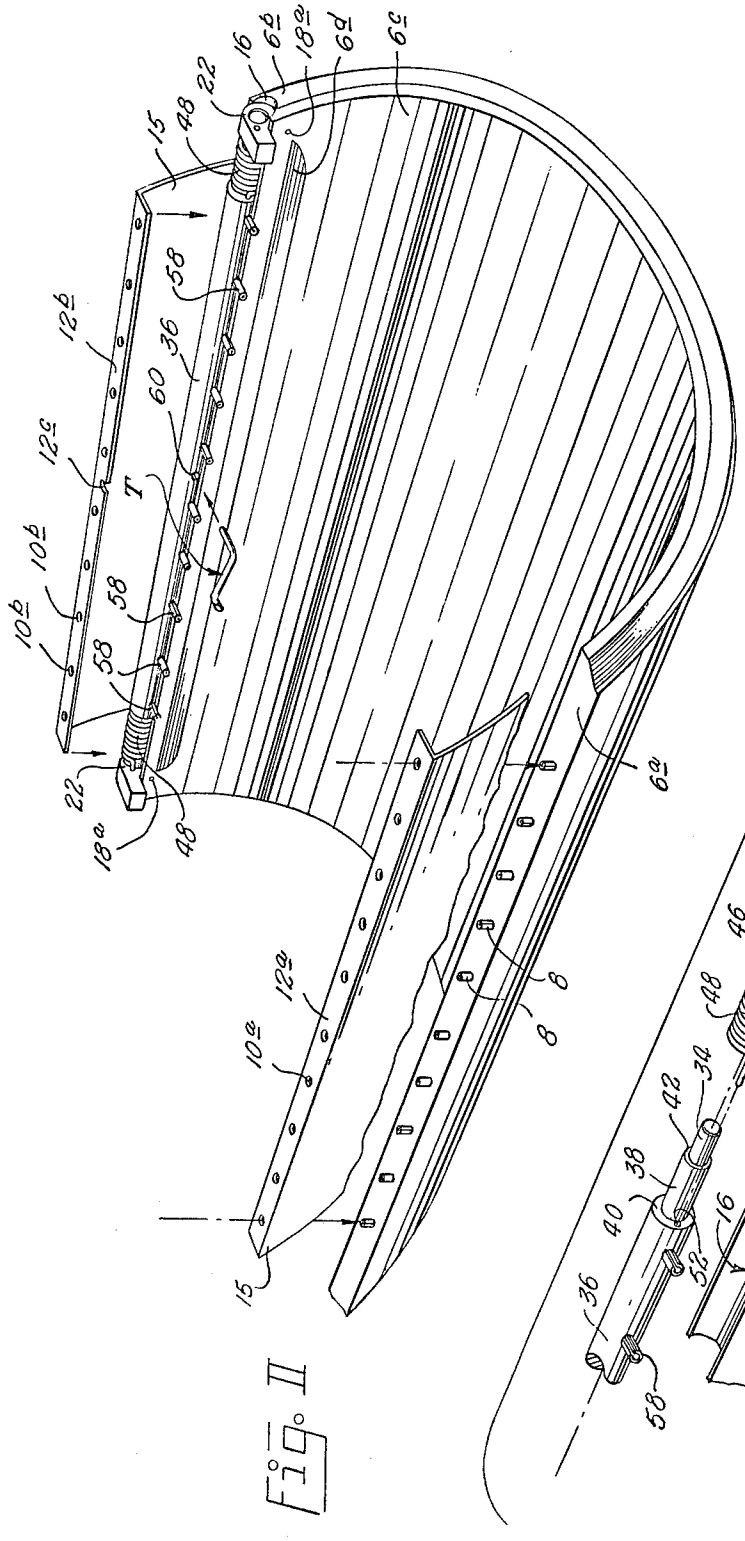


Fig. II

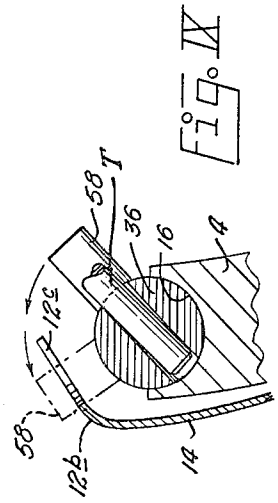


Fig. IV

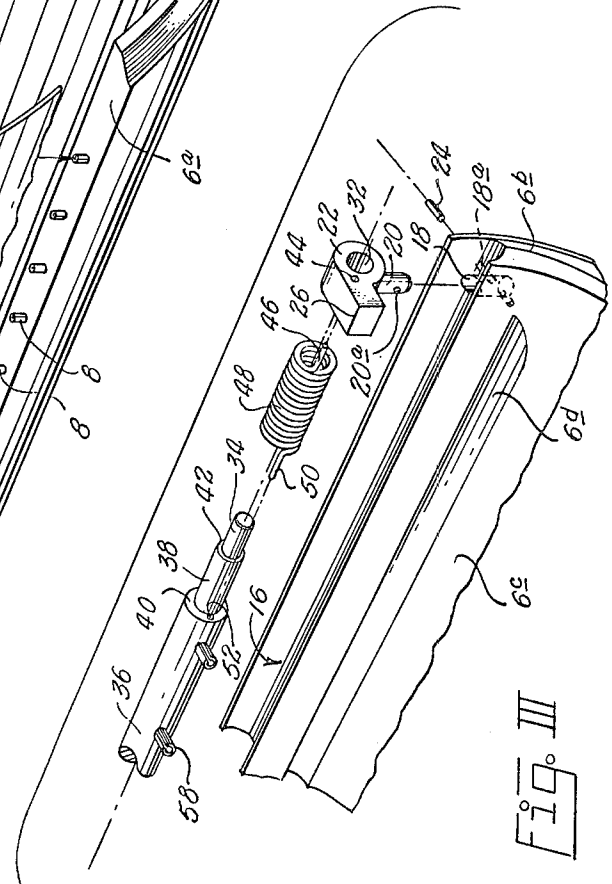


Fig. III

PLATE CLAMP

BACKGROUND OF THE INVENTION

Lithographic printing plates are generally constructed of thin, flexible metal and have flanges formed on leading and trailing edges thereof. The flange on the leading edge of the plate is generally inserted into a groove or slot formed in the plate cylinder and the trailing edge has been secured by various forms of clamping devices.

For example, U.S. Pat. No. 3,533,355 discloses a clamping member having a row of set screws extending therethrough to permit adjustment of the edge of the clamping member circumferentially about a plate cylinder.

Another type of mechanism for clamping plates to plate cylinders in a printing press is illustrated in U.S. Pat. No. 3,058,417 in which opposite edges of the printing plate are clamped prior to tensioning the printing plate by inflating a rubber tube.

Plate clamps heretofore devised required use of tools for tightening screws or bolts to secure a plate clamp in position and required substantial time for changing plates and making the press ready to print.

SUMMARY OF INVENTION

I have devised an improved plate clamp comprising a shaft having outwardly extending projections or pins spaced along the length thereof positionable through apertures formed along the trailing edge of a printing plate.

For attaching a plate to a printing cylinder projections or pegs on the printing cylinder are positioned through apertures adjacent the leading edge of the printing plate. The plate is then wrapped around in portion of the circumference of the printing cylinder and apertures adjacent the trailing edge of the printing plate are positioned over the projections on the rotatable shaft. A spring on the shaft urges the projections to a position wherin the printing plate is properly tensioned.

The shaft is manually rotated to permit removal of the printing plate.

The improved plate clamp is attached to a saddle connectable to the cylinder of a letter press for example, of the type employed for printing newspapers, to expeditiously convert a letter press for lithographic printing.

A primary object of the invention is to provide a plate clamp adjacent to positively engage edges of a printing plate and to automatically draw the plate to a predetermined tension.

Another object of the invention is to provide a plate clamp resiliently drawing a printing plate to a predetermined tension by application of a substantially constant force adjacent the trailing edge of the printing plate.

A further object of the invention is to provide a saddle for converting a letter press to a lithographic printing press wherein each of the saddles has a spring urged plate clamp mechanism secured thereto permitting attachment of the saddle and plate clamp to a cylinder of the letter press.

Other and further objects of the invention will become apparent upon referring to the detailed description hereinafter following and to the drawings annexed hereto.

DESCRIPTION OF THE DRAWING

Drawings of a preferred embodiment of the invention are annexed hereto so that the invention may be better and more fully understood, in which:

FIG. I is an end view of a printing cylinder having a pair of saddles secred thereto, each saddle having plate clamps incorporated therein;

FIG. II is a perspective view of a saddle;

FIG. III is a fragmentary exploded perspective view of a saddle and plate clamp;

FIG. IV is an enlarged fragmentary elevational view of the plate clamp illustrated in FIG. I;

FIG. V is a cross-sectional view taken along lines V—V of FIG. IV;

FIG. VI is a cross-sectional view taken along the lines VI—VI of FIG. V;

FIG. VII is a cross-sectional view taken along the line VII—VII of FIG. V;

FIG. VIII is a cross-sectional view taken along line VIII—VIII of FIG. V; and

FIG. IX is a fragmentary cross-sectional view similar to FIG. VIII illustrating a method of rotating the plate clamp for engaging or disengaging a printing plate.

Numeral references are employed to designate like parts throughout the various figure of the drawing.

PREFERRED EMBODIMENT

Referring to FIG. I of the drawing, the number **1** generally designates a printing cylinder having journals **2** adjacent opposite ends thereof rotatable in a bearing (not shown).

Saddles **4** and **6** are of identical construction having leading edges **4***a* and **6***a* and trailing edges **4** *b* and **6***b* respectively. The concave sides **4***c* and **6***c* of the respective saddles have notches **6**d formed therein, as best illustrated in FIGS. II and III, to receive lugs on cylinder **1** securing the saddles to the plate cylinder.

As best illustrated in FIG. II, the leading edge **6***a* of saddle **6** has pegs **8** extending outwardly therefrom to extend through apertures **10***a* formed in a deflected flange **12***a* adjacent leading edge of printing plate **15.**

As best illustrated in FIG. III the trailing edge **6***b* of saddle **6** has a semi-circular seat **16** formed therein. Sockets **18** are formed in opposite ends of seat **16** to receive pin **20** on hinge element **22.** Pin **20** has an aperture **20***a* extending transversely therethrough to receive a dowel **24** when positioned in hole **18***a* extending through the edge **6***b* of saddle **6** and intersecting socket **18.**

Hinge element **22** has a lug **26** formed thereon positioned to engage shoulder **28** on a tail stop comprising elongated rectangular bar **30** extending longitudinally through gap **32** formed in a surface of cylinder **1** of the compression lock-up type.

As best illustrated in FIGS. III and V, hinge element **22** has a bore **32** extending therethrough to receive the journal **34** on the end of shaft **36.** Opposite ends of shaft **36** have reduced diameter portions **38** formed thereon to provide shoulders **40** and **42** adjacent each end thereof. It should be appreciated that the bore **32** through hinge element **22** receives journal **34** on the end of shaft **36** while shoulder **42** in maintained in abutting relation with hinge element **22** preventing longitudinal movement of shaft **36** relative to saddles **4** and **6.**

Hinge element **22** has a hole **44** formed therein to receive end **46** of coil spring **48.** The opposite end **50** of

coil spring **48** extends into a hole **52** formed in shoulder **40** on shaft **36.**

Connector means such as pins **58** extend into spaced apertures **10***b* formed in flange **12***b* of printing plates **14** and **15.** Rotation of shaft **36** is limited by stop pin **65** secured to saddle **4** and positioned in slot **66** formed in shaft **36.**

The operation and function of the apparatus hereinbefore described is as follows:

Saddles **4** and **6** are attached to cylinders **1** in the same manner and employing conventional connector lugs heretofore employed for attaching letter press plates to a printing cylinder. Either compression or tension lock-up devices may be employed.

After saddles **4** and **6** have been connected to cylinder **1** printing plate **15** is connected about the outer surface of saddle **6** by positioning apertures **10***a* extending through flange **12***a* adjacent the leading edge of plate **15** about pegs **8.** Tool T is inserted in opening **60** formed in a central portion of shaft **36** and shaft **36** is rotated to the position illustrated in the dashed outline in FIG. IX. Pins **58** are positioned through apertures **10***b* extending through flange **12***b* adjacent the trailing edge of plate **15.** When tool T is released springs **48** will urge shaft **36** to the position illustrated in full outline in FIG. IX drawing the plate to a predetermined tension established by the spring constant of springs **48.**

Plates **14** and **15** can be removed by positioning tool T through the slot **12***c* in the central portion of flange **12***b* into opening **60** and rotating shaft **36** to the position illustrated in the dashed outline in FIG. IX.

From the foregoing it should be readily apparent that printing plates can be quickly and accurately positioned about the surface of the printing cylinder without necessitating loosening and tightening of screws or bolts as has been heretofore required for securing plate clamps.

While the plate clamp hereinbefore described has been illustrated in combination with a saddle for adapting a letter press to a lithographic printing press, it should be appreciated that the plate clamp structure can be connected directly to the plate cylinder of a lithographic printing press adjacent opposite sides of a gap extending longitudinally thereof. It should further be appreciated that the plate clamp hereinbefore described is sufficiently compact to be employed in web presses wherein the printing plate extends about substantially all of the circumference of the plate cylinder.

While the embodiment of the invention hereinbefore described and illustrated in the attached drawing is a preferred embodiment of the invention, other and further embodiments of the invention may be devised without departing from the basic concept thereof.

Having described my invention, I claim:

1. Apparatus to secure a printing plate having apertures formed in flanges on leading and trailing edges thereof to a cylinder having a longitudinally extending gap formed therein comprising: spaced pegs secured adjacent a first edge of the gap formed in the cylinder; a shaft; connector pins on said shaft positionable in apertures in the flange on the trailing edge of the printing plate; means to rotatably secure the shaft adjacent the second edge of the gap formed in the cylinder; and resilient means secured between the shaft and the means to rotatably secure the shaft to the cylinder, said resilient means being adapted to urge the connector pins on the shaft into the gap formed in the cylinder.

2. The combination called for in claim **1** wherein the means to rotatably secure the shaft to the cylinder comprises: a hinge element having a bore extending therethrough; and means to secure said hinge element to the cylinder, and wherein the shaft has a journal formed on the end thereof; a shoulder adjacent said journal, said journal being positioned in the bore in the hinge element such that the shoulder on the shaft engages said hinge element to limit longitudinal movement on the shaft relative to hinge element.

3. Apparatus to secure a printing plate to a cylinder having a longitudinally extending gap formed therein comprising: means to secure a first edge of a printing plate adjacent a first edge of the gap formed in the cylinder; a shaft; connector means to secure a second edge of a printing plate to said shaft; a saddle to rotatably secure the shaft adjacent the second edge of the gap formed in the cylinder; means to secure the saddle about a portion of the surface of a cylinder, said saddle having a seat formed in an edge thereof; hinge means to rotatably secure said shaft in said seat; and resilient means secured between the shaft and the saddle, said resilient means being adapted to urge the connector means on the shaft into the gap formed in the cylinder.

4. The combination called for in claim **3** wherein the hinge means to rotatably secure said shaft in said seat comprises: a hinge element having a bore extending longitudinally therethrough; a pin on said hinge element extending into a socket formed in said seat in the saddle; and a spring positionable about said shaft, one end of said spring being secured to said hinge element and the other end of said spring being secured to said shaft.

5. A printing press cylinder comprising: a cylinder; a printing plate having leading and trailing edges; a first flange on said leading edge; a second flange on said trailing edge, each of said flanges having a row of apertures formed therein; spaced pegs secured to said cylinder, said pegs extending through apertures in said first flange on the leading edge of the printing plate; a shaft; hinge means rotatably securing opposite ends of said shaft to said cylinder; torsion spring means about each end of said shaft; means securing first ends of each of said torsion springs to said cylinder; means securing second end of said torsion springs to said shaft; and spaced pins on said shaft positioned through apertures in said second flange on the trailing edge of said printing plate, said torsion springs urging said pins to a position wherein the printing plate is drawn to a controlled tension about said cylinder.

6. Apparatus to secure a printing plate about the surface of a cylinder comprising: a saddle having first and second edges and a seat formed in a first edge thereof; means to secure the saddle about a portion of the surface of the cylinder; spaced hinge elements; each of said hinge elements having a bore extending therethrough; means securing said hinge elements adjacent said first edge of said saddle; a shaft having opposite ends rotatably secured in said bores in said hinge elements, said shaft extending longitudinally of said seat; a spring positioned about said shaft; means securing one end of said spring to one of said hinge elements; means securing a second end of said spring to said shaft; means to secure a first edge of the printing plate to said shaft; and means to secure a second edge of the printing plate adjacent said second edge of said saddle.

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