June 29, 1965 C. J. HERMACH ETAL 3,191,532

PLATE CLAMPING MECHANISM FOR ROTARY PRINTING PRESS

Filed Dec. 26, 1963 4 Sheets-Sheet 1

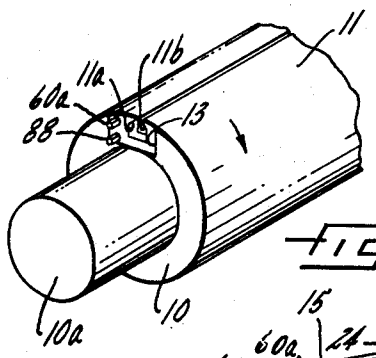


Fig. 1.

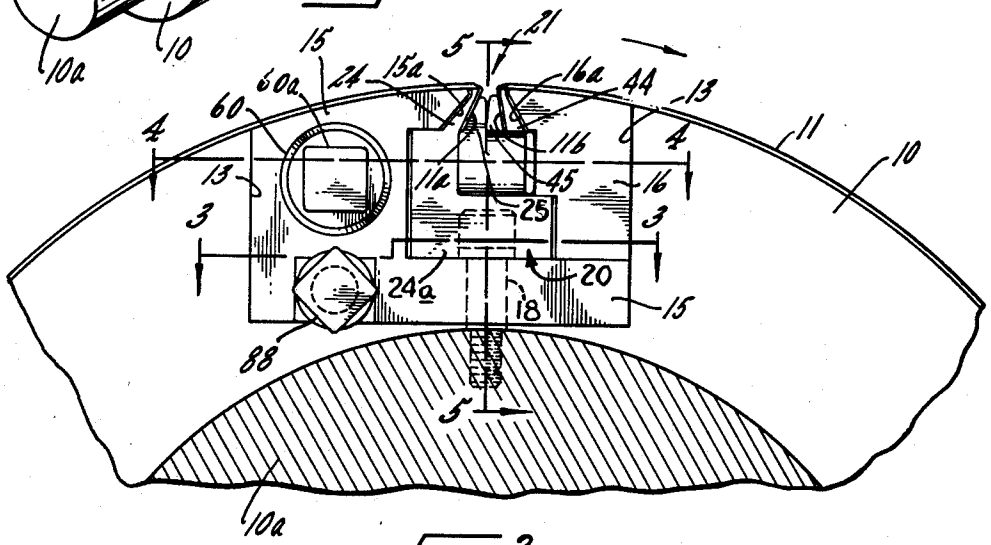


Fig. 2.

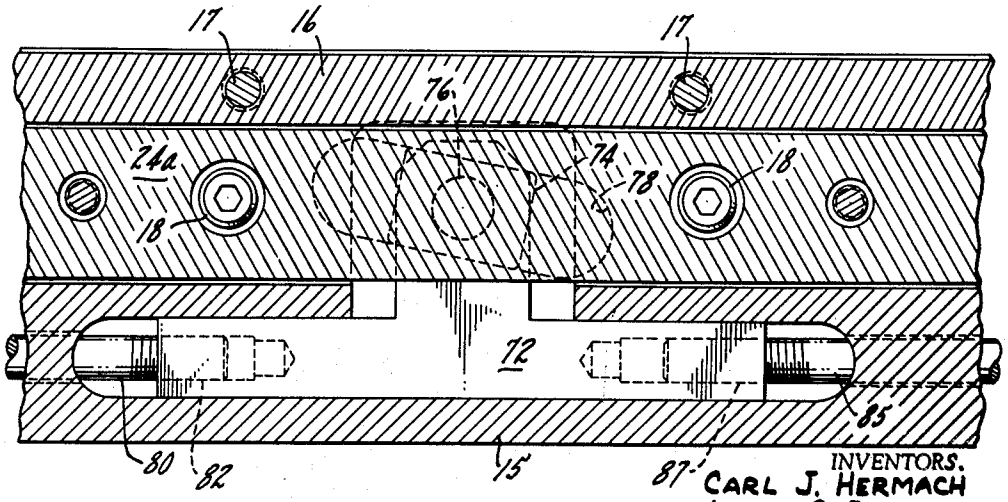


Fig. 3.

INVENTORS.
CARL J. HERMACH
BY LOUIS S. DEPA

Wolfe, Hubbard, Voit & Osann
ATTORNEYS.

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Filed Dec. 26, 1963 4 Sheets-Sheet 2

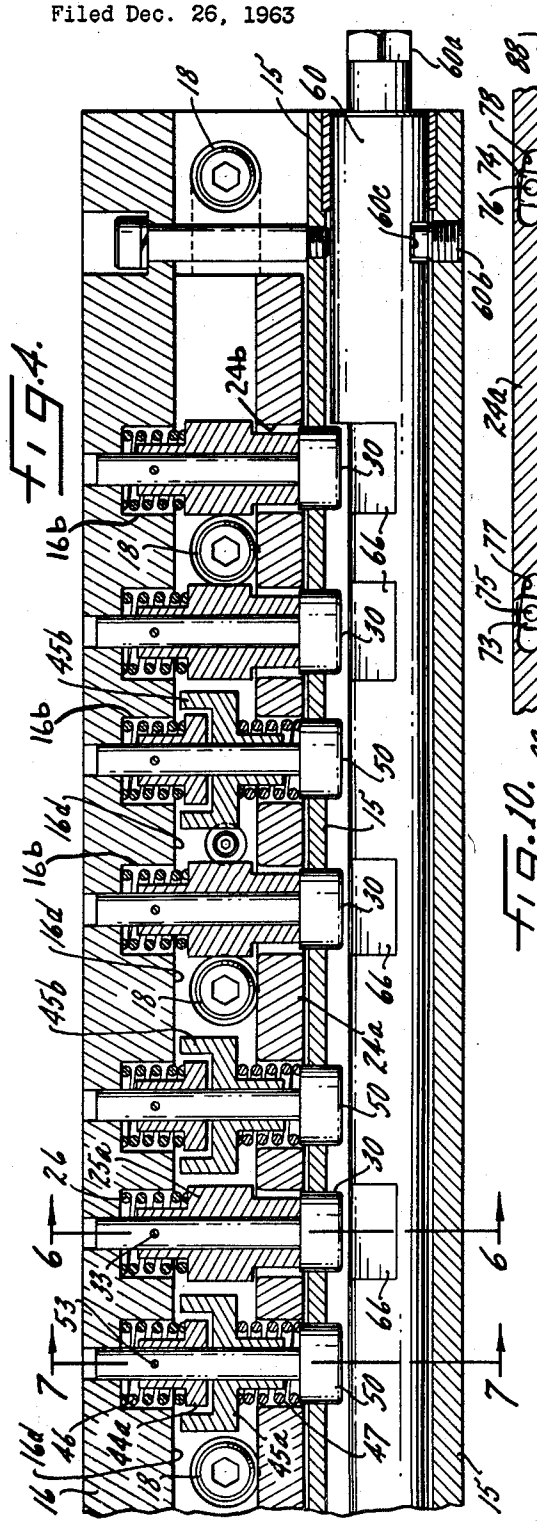


FIG. 4.

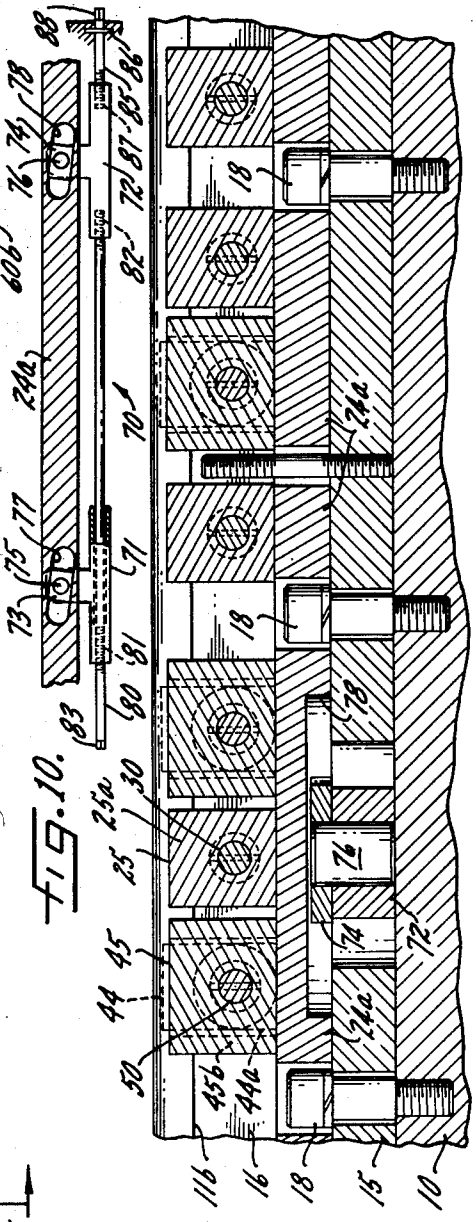


FIG. 10.

FIG. 5.

INVENTORS.
CARL J. HERMACH
LOUIS S. DEPA
BY
Wolfe, Hubbard, Voit & Osann
ATTORNEYS.

June 29, 1965 C. J. HERMACH ETAL 3,191,532

PLATE CLAMPING MECHANISM FOR ROTARY PRINTING PRESS

Filed Dec. 26, 1963 4 Sheets-Sheet 3

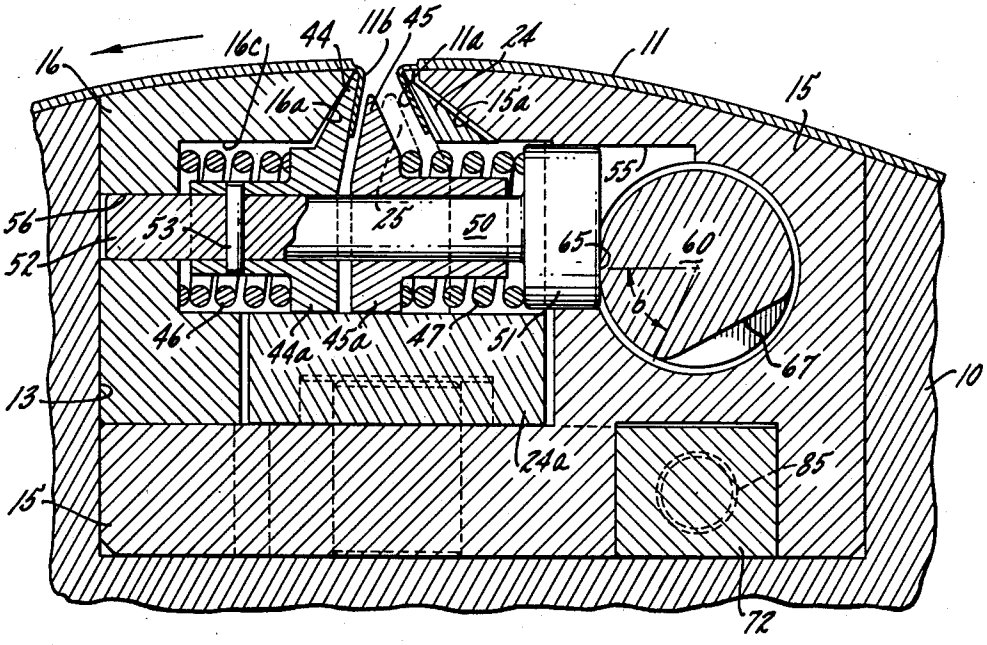


Fig. 7.

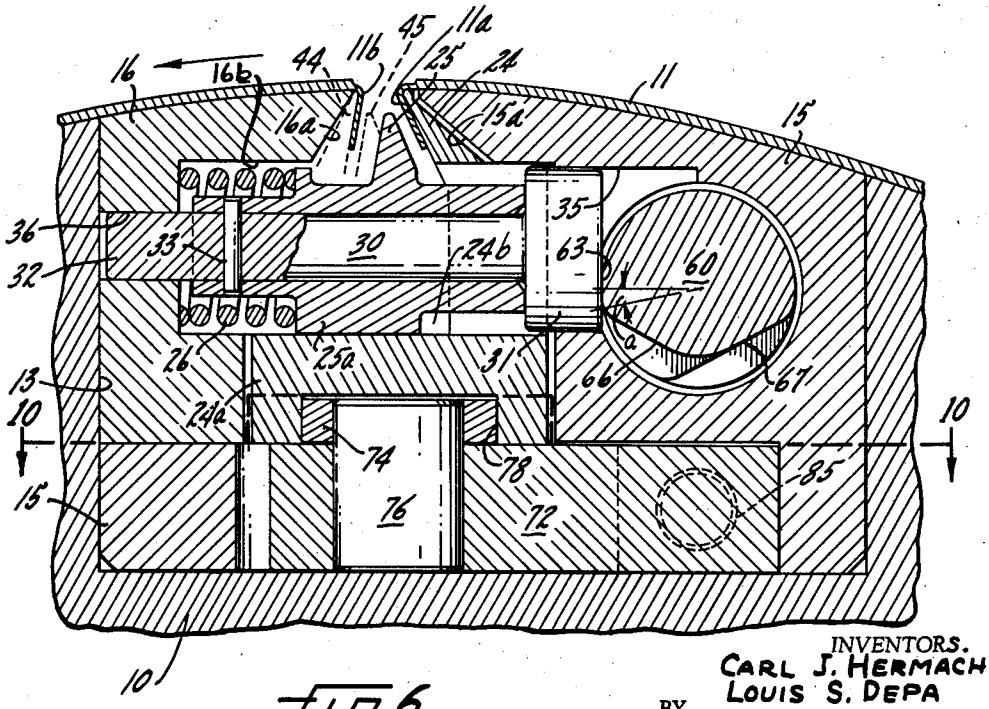


Fig. 6.

INVENTORS.
CARL J. HERMACH
LOUIS S. DEPA

BY

Wolfe, Hubbard, Voit & Osann
ATTORNEYS.

June 29, 1965 C. J. HERMACH ETAL 3,191,532

PLATE CLAMPING MECHANISM FOR ROTARY PRINTING PRESS

Filed Dec. 26, 1963 4 Sheets-Sheet 4

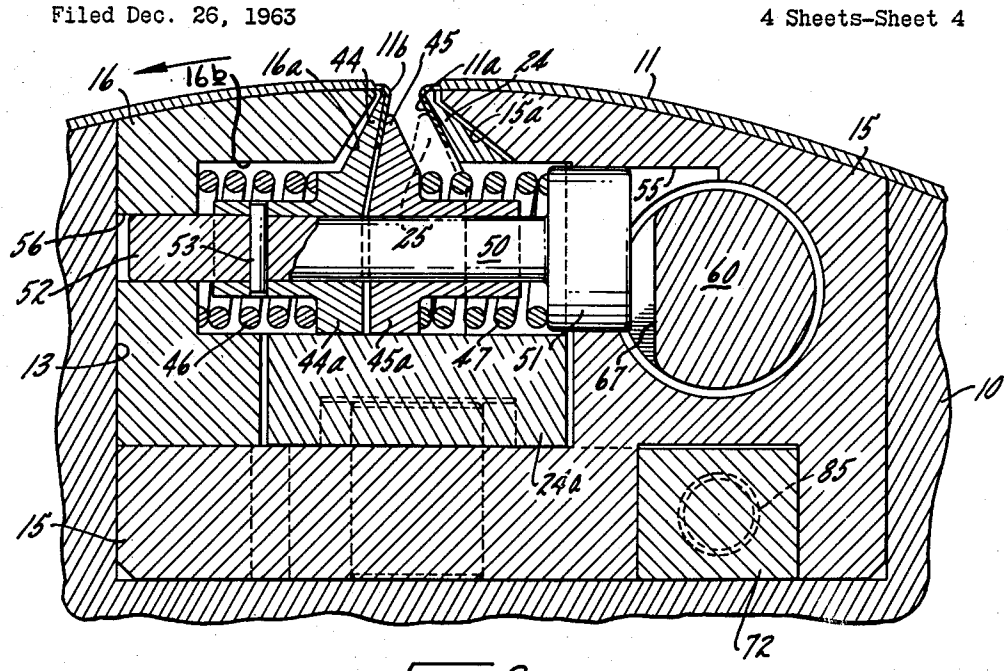


Fig. 9.

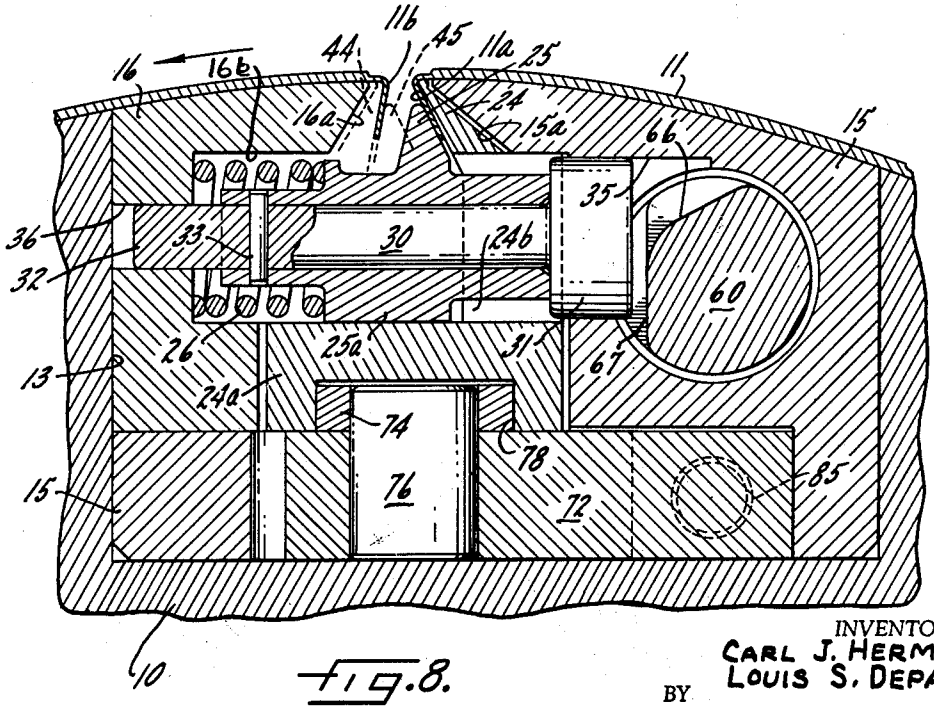


Fig. 8.

INVENTORS.
CARL J. HERMACH
LOUIS S. DEPA

BY

Wolfe, Hubbard, Voit & Osann
ATTORNEYS.

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3,191,532

PLATE CLAMPING MECHANISM FOR ROTARY PRINTING PRESS

Carl J. Hermach, Westchester, and Louis S. Depa, Chicago, Ill., assignors to Miehle-Goss-Dexter, Incorporated, Chicago, Ill., a corporation of Delaware

Filed Dec. 26, 1963, Ser. No. 333,444
12 Claims. (Cl. 101—415.1)

The present invention relates to rotary printing presses and more particularly to a plate clamping mechanism for clamping a flexible printing plate on a plate cylinder.

It is an object of the present invention to provide a clamping mechanism for clamping the leading and trailing edges of a thin flexible printing plate which is capable of securing the leading and trailing edges close to one another in locked up condition. It is a related object to provide a clamping mechanism for a thin printing plate which provides an extremely narrow access slot running the length of the cylinder permitting maximum utilization of the cylinder area for printing purposes and with the non-printing area thus reduced to a minimum. It is an object of the invention to provide a plate clamping mechanism which, in spite of the close spacing of the plate edges and resulting severe space limitations at the region of gripping, is, nevertheless, highly reliable, preventing any plate creep or dislodgement even over long high speed press runs.

It is another object of the present invention to provide a plate clamping mechanism which is easily operated, requiring only the rocking of a control shaft to effect clamping at the leading edge, clamping at the trailing edge, and resilient takeup to draw the plate into intimate contact with the cylinder. In this connection it is an object to provide a plate clamping mechanism in which these events are caused to take place automatically in predetermined sequence when a plate is installed and in reverse sequence to free the plate prior to removal.

It is still another object of the present invention to provide a plate clamping assembly recessed in the groove formed in the surface of the printing cylinder and having exposed faces forming a smooth continuation of the cylindrical surface free of any countersunk depressions for bolt heads or the like and free of any other discontinuity which might permit the thin plate to become locally depressed, or dimpled, to produce a light-printing area during operation.

It is yet another object of the present invention to provide a plate clamping mechanism having the foregoing advantages but which nevertheless permits positive registering adjustment of the leading edge of the plate for precise multicolor printing.

Finally, it is an object of the present invention to provide a plate clamping mechanism which is compact, relatively simple and inexpensive, and which requires little or no maintenance.

Other objects and advantages of the invention will become apparent upon reading the attached detailed description and upon reference to the drawings in which:

FIGURE 1 is a fragmentary perspective of a plate cylinder constructed in accordance with the present invention.

FIG. 2 is an enlarged fragmentary end view of the plate cylinder of FIG. 1.

FIG. 3 is a fragmentary section taken along the line 3—3 in FIG. 2 and showing elements for effecting bodily adjustment of the reference clamping jaw at the leading edge of the plate.

FIG. 4 is a fragmentary section looking along the line 4—4 in FIG. 2 showing the clamping and tensioning springs and the associated jaw bodies in plate locking and tensioning position.

FIG. 5 is a fragmentary section taken along the line 5—5 in FIG. 2.

FIG. 6 is a fragmentary transverse section taken along the line 6—6 in FIG. 4 showing the leading edge jaws in spread-apart condition.

FIG. 7 is a fragmentary transverse section taken along the line 7—7 in FIG. 4 showing the trailing edge jaws in spread-apart condition.

FIG. 8 is a fragmentary section similar to FIG. 6 but showing the leading edge jaws in clamping position.

FIG. 9 is a fragmentary section similar to FIG. 7 but showing the trailing edge jaws in clamping position.

FIG. 10 is a diagram showing the adjusting means for the reference jaw 24 as viewed along the line 10—10 in FIG. 6.

While the invention has been described in connection with a preferred embodiment, it will be understood that we do not intend to be limited to the embodiment shown but on the contrary it is our intention to cover the various alternative and equivalent constructions included within the spirit and scope of the appended claims.

Turning now to the drawings there is shown in FIG. 1 a plate cylinder 10 mounted for rotation on journals 10*a* (only one shown) and carrying a thin flexible printing plate 11 having a leading edge 11*a* and trailing edge 11*b*. Longitudinally formed in the cylinder is a groove 13 in which is secured the plate clamping and tensioning means of the present invention.

Seated within the groove 13 is a first or leading edge rail member 15 and a second or trailing edge rail member 16. The latter are machined so as to define a central clamp receiving space 20 and a narrow access slot 21. The exposed faces are machined to provide a smooth continuation of the cylinder surface right up to the edges of the slot 21. The lips of the rail members, adjacent the slot 21, are formed with an angular chamfer or undercut as indicated at 15*a*, 16*a*, respectively, defining an access space of trapezoidal cross section. The rail members are secured together by screws 17 (FIG. 3) and the entire device may be bench-assembled before being installed in the cylinder. The assembled unit is secured in the cylinder by means of screws 18 (FIGS. 1, 4 and 5).

For the purpose of securing and positioning the leading edge 11*a* of the plate, a leading edge clamp, or jaw set, is provided including a reference jaw and plurality of clamping jaws. The reference jaw, indicated at 24, which preferably extends half the length of the cylinder, is of tapered cross section to conform with or nest adjacent the undercut surface 15*a*, narrowing down to a thin edge so as to occupy a minimum amount of space in the access slot. The reference jaw 24 is integral with a longitudinally extending base or pedestal 24*a* having a plurality of apertures 24*b* spaced along its length providing clearance for the associated parts of the clamping mechanism. It is one of the features of the construction that the reference jaw 24 may be both peripherally adjusted and skewed as necessary to secure a condition of register. The means for accomplishing this will be discussed following a discussion of the clamping function.

Arranged adjacent the reference jaw 24 are a plurality of leading edge clamping jaws 25. Each clamping jaw 25 conforms in shape to reference jaw 24 and has a body 25*a* to which a clamping spring 26 applies resilient clamping force, the springs being received in recesses 16*b* provided in the rail 16. For the purpose of supporting and operating the clamping jaws 25, an associated plunger 30 having a head 31 and a shank 32 is provided, the jaw body being secured to the shank by a pin 33. For the purpose of guiding the plunger 30 for movement in a chordwise direction, the head 31 is fitted into a bore 35 in the rail 15 while the shank 32 is received in a bore 36 in the rail 16.

The control means for actuating the jaws 25 will be discussed shortly; it will suffice to say that when the plungers 30 are released, the jaws 25 move into engagement with the reference jaw 24 under the influence of springs 26.

Turning next to the clamping mechanism for the trailing edge of the plate, a trailing edge clamp, or jaw set, is provided which includes a plurality of trailing edge supporting jaws 44 and trailing edge clamping jaws 45 (see FIG. 7). The trailing edge jaws 44, 45 taken together perform the dual function of clamping the trailing edge of the plate and applying peripheral tension to the plate so that it closely hugs the cylinder. The supporting jaws 44 are, similarly to the reference jaw previously referred to, of tapering cross section, to conform with, or nest, closely with respect to the under cut 16*a* and presenting a relatively thin supporting edge which extends into the access space along the cylinder. Each of the supporting jaws 44 has a body portion 44*a* with which it is integral and an associated spring 46, as will be seen, performs a plate tensioning function. Additional recesses 16*b* are provided in the rail 16 for receiving the springs 46. Each of the cooperating clamping jaws 45 has a body 45*a* and is biased in the clamping direction by an associated coil spring 47.

In accordance with one of the aspects of the present invention each of the clamping jaw springs 47 is seated with respect to, or coupled to, the associated supporting jaw, and stops are interposed in the path of movement of the clamping jaws so that when the supporting jaws are forcibly retracted the stops are engaged, the continued movement of the supporting jaws being effective to release the plate. Conversely, when the supporting jaws are moved in the opposite direction during lockup, they come into clamping engagement with the clamping jaws, moving the latter from their stops, and the continued movement of the supporting jaws under the urging of the tensioning springs 46 serves to tension the plate. In accordance with one of the more detailed features of the invention each of the supporting jaws is connected to an operating plunger on which is mounted the associated clamping jaw and its spring, so that movement of the plunger is effective to move both of the jaws for sequential clamping and tensioning of the plate. Thus, we provide a plunger 50 having a head 51 and shank 52 secured to the jaw by a pin 53. The head slides in a bore 55 formed in the rail 15 and the shank is received in an alined bore 56 in the rail 16.

The stop function is performed by legs 45*b* formed integral with the jaws 45 and which are obstructed or limited in their path of movement by the lands 16*d* between the adjacent recesses 16*b* in the rail 16 (FIG. 4). The springs 47 preferably rest against the heads of their operating plungers as shown.

Thus, upon movement of the plungers 50 to the right from the position shown in FIG. 7, the springs 46, 47 expand, with accompanying movement of the supporting jaws 44 in the plate-engaging and tensioning direction. The clamping jaws 45 do not initially move, the legs 45*b* thereof being held seated on their respective stop surfaces 16*d* by springs 47. The trailing edge 11*b* of the plate is free initially to move with the supporting jaws 44 since the plate, when placed on the cylinder, is not tight. This movement continues until the supporting jaws 44 engage clamping jaws 45, with the edge of the plate in between, following which the legs 45*b* of the clamping jaws (FIG. 4) are lifted from the stop surfaces 16*d*. Once the clamping jaws 45 are unseated from their stop surfaces they are fully effective, under the urging of their associated clamping springs 47, to bring clamping pressure to bear against the plate. Upon continued movement of the plungers 50, the jaws move as a pair under the urging of the associated springs 46 to apply tension to the plate. It will be understood by one skilled in the art that simply releasing the plungers 50, so that the tensioning springs 46 are effective, may not immediately develop full tension about the entire plate periphery, but after the plate cylinder is in motion the rolling action of the associated cylinders tends to draw the plate out along the surface of the cylinder and in intimate contact therewith so that the tensioning springs 46 perform, primarily, a takeup function as the plate achieves its final running condition.

In accordance with one of the important aspects of the present invention the first and second sets of operating plungers 30, 50 are interspersed with one another and arranged in axial alinement for operation by a single cam control member which extends axially of the cylinder through the rail structure. Specifically, we provide a control member 60 in the form of a shaft having first and second sets of cam surfaces formed thereon for operating the sets of plungers in sequence so that clamping occurs at the leading edge of the plate prior to the trailing edge. Referring to the drawings and particularly to FIGS. 4, 6 and 7 there is provided a longitudinally extending control shaft 60 having a first set of cam surfaces 63 alined with the plungers 30 and a second set of cam surfaces 65 alined with the plungers 50. The cam surfaces 63 are defined by machining flats on the shaft, as shown at 66, to define an adjacent, relatively short effective "high" portion as indicated by the angle *a* in FIG. 6. The cam surfaces 65, which control the trailing edge jaws, have a more extensive "high" portion, indicated by the angle *b* terminating in a dropoff. The dropoff is conveniently defined by a flat 67 which extends along substantially the entire length of the camshaft 60.

The sequential operation which is achieved by the two sets of cam surfaces will be apparent upon comparing FIGS. 6 and 7 of the drawings, which show the jaws in retracted condition, and FIGS. 8 and 9 which show the jaws released for clamping. Thus in FIGS. 6 and 7 the cam surfaces 63, 65 on the outside diameter of the shaft are both effective to hold the associated plungers 30, 50 in their retracted positions, i.e., with the jaws open. Upon rotating the camshaft 60 clockwise, as viewed in the drawings, through an angle *a*, the point of dropoff of the cam surfaces 63 is reached allowing all of the plungers 30 to move, under the urging of the springs 26, for clamping engagement of jaws 24, 25 with the leading edge of the plate therebetween. Upon further rotation of the camshaft, through a total angle *b*, the point of dropoff of the cams 65 is reached thereby permitting each of the plungers 50 to move under the urging of their associated springs. As prevously mentioned, this latter movement can be considered to take place in two steps; first, the movement of the supporting jaws 44 into engagement with the associated clamping jaws 45 lifting the legs 45*b* of the clamping jaws from their stop surfaces, followed by joint movement of the jaws, in their gripping relation, and under the urging of the springs 46, for applying tension to the trailing edge of the printing plate. The position of the shaft 60 in the lockup condition is set forth in FIGS. 8 and 9.

To release the plate, the camshaft 60 is rocked in the opposite or counterclockwise direction to produce the reverse operating sequence. Thus initial leftward movement of the plungers 50 upon engagement by the edge of cam surfaces 65 serves to move the jaws 44, 45 bodily to the left. Following this, the legs 45*b* engage the stop surfaces 16*d* to hold the clamping jaws 45 stationary in the cylinder while the supporting jaws 44 retract further, thereby separating jaws 44, 45 and freeing the trailing edge. Additional rocking causes engagement between the edge of cam surfaces 63 and the plungers 30, retracting the clamping jaws 25 against the force of the biasing springs 26 to separate jaws 24, 25 and free the leading edge of the plate.

While the present mechanism provides positive sequencing of a plurality of functions, it is noteworthy that the operator need give no consideration to what occurs in the mechanism. It suffices from the operator's viewpoint simply to throw a single control member between

two positions, which may be accomplished by applying a wrench to the squared end **60***a* (FIGS. 2 and 4) of the shaft **60**. The limit positions of shaft rotation may be defined by any simple means, for example, a plug **60***b* which registers with a groove **60***c* formed part way about the shaft periphery.

In accordance with one of the aspects of the invention means may be provided for peripherally adjusting, and skewing the reference jaw **24** to secure precise registration of the printing plate **11** as required in multicolor printing. To this end a pair of adjusting blocks are provided having angled groove connections with the pedestal **24***a* of the reference jaw **24**, with provision for either differential movement, or joint movement in the same direction, to effect peripheral adjustment or skewing adjustment of the reference jaw. Thus referring to FIG. 10, which is semi-diagrammatic, and with reference also to FIGS. 2, 5 and 6, a register adjusting means **70** is provided employing a first adjusting block **71** and a second adjusting block **72** guided for endwise movement. Secured to the adjusting blocks are rectangular slides **73**, **74**, respectively, on pins **75**, **76**, the slides being received in angled grooves **77**, **78** formed in the underside of the pedestal **24***a* adjacent the ends thereof.

For the purpose of moving the adjusted blocks differentially for skewing adjustment of jaw **24**, an adjusting rod **80** is used having opposite threaded connections with each of the blocks; thus a right hand thread **81** is provided in the block **71** and a left hand thread **82** in the block **72**. Turning the adjusting rod **80** by means of a wrench on the squared end **83** causes the two blocks to be moved relatively toward or away from one another. Since the grooves **77**, **78** are angled in the same direction, this has the effect of skewing the pedestal **24***a* in one direction or the other. For the purpose of peripherally adjusting the leading edge of the plate, a second adjusting rod **85** is provided which is held captive as indicated at **86** and which has a threaded connection **87** with the block **72**. Thus turning the rod **85** in one direction or the other, by a wrench secured to its outer squared end **88**, causes the ends of the pedestal **24***a* to be cammed in the same direction. The skew adjustment may, if desired, be made when the camshaft **60** is in a mid position, i.e., with the plungers **30** gripping the leading edge of the plate and with the plungers **50** still pressed inwardly for freeing the plate at the trailing edge. Since the reference jaw **24** extends continuously over the length of the plate and since the plate supporting jaws at the trailing edge are in the form of a multiplicity of separate floating jaw assemblies, each with a separate biasing spring, the set of jaws at the trailing edge readily accommodates the skewing movement.

It will be apparent to one skilled in the art that the arrangement described above has a high degree of compactness at the region of the jaws and an extremely narrow access slot, for example, on the order of only ¼ inch in width, while nevertheless providing great durability and reliability under actual operating conditions. This enables the ends of the printing plate to be nearly touching resulting in almost complete utilization of the cylinder area for printing purposes. This is brought about in part by nesting the reference jaw at the leading edge, and the supporting jaws at the trailing edge, closely adjacent the undercut surfaces **15***a*, **16***a* which define the trapezoidal access space. Moreover, the reference jaw and supporting jaws are not only tapered in cross section but are convergently arranged so that the space between them, and which is available for the clamping jaws, is of trapezoidal section permitting the necessary adjusting movement of the triangularly sectioned clamping jaws, and with the clamping jaws at the leading and trailing edges being interspersed with one another along the length of the plate. This is to be contrasted with other efforts to achieve a compact lock-up for thin plates which have been characterized by supporting structure of relatively thin cross section susceptible to damage under pressroom conditions and requiring frequent maintenance and adjustment. The present device requires no adjustment except during clamping where the skewing and peripheral adjustment feature is employed. Operation is reliable over long periods of time and there is negligible risk of throwing a plate at high speed.

It is one of the more detailed features of the present invention that the exposed surfaces of the longitudinally extending rails **15**, **16** form a smooth continuation of the surface of the cylinder, uninterrupted by countersunk holes for bolt heads or by any other discontinuity or depression which would tend to form a dimple in the thin printing plate during normal operation. As understood by one skilled in the art, any localized depression may result in a light or non-printing area. On the contrary, rather than being secured in the usual fashion, the rails are secured to the cylinder by a series of cap screws **18** which are centered with respect to the clearance opening **21** to provide straight through access of a suitable wrench, for example of the Allen type, into the screw head. In a practical case where the opening **21** is extremely narrow, on the order of ¼ inch, the wrench may be necked down to a diameter which is just slightly smaller than the width of the access slot. Under such circumstances the wrench may be entered at the ends of the rails with the necked down portion registering in the access slot and advanced from one to the next of the securing bolts **18**. Thus, in the event that inspection is necessary, it is a simple matter to remove the screws **18** which fasten the rails in place, following which the entire assembly may be lifted out of its position in the cylinder for benchwork. Substitution of a replacement unit involves simply the insertion and tightening of the screws **18** with minimum loss of press production.

While the invention has been described in connection with the securing of a thin printing plate on a cylinder, it will be apparent to one skilled in the art that the invention is not limited thereto but would be applicable wherever it is desired to secure a surfacing blanket or cover member to a cylindrical surface for providing smooth interrupted support over the cylinder area with the exception only, of a narrow access slot into which the ends are received.

Thus the term "plate" as used in the claims is a general term applying to any thin covering member for a cylinder and held under tension at its leading and trailing edges.

We claim as our invention:

1. In a plate clamping mechanism for clamping a thin plate on a cylinder having a longitudinal groove formed therein, the combination comprising first and second rail members secured together to define a longitudinally extending clamp receiving space having a narrow access slot at the periphery of the cylinder, a leading edge jaw set having a reference jaw extending into said slot and a plurality of leading edge clamping jaws cooperating therewith, a first set of plungers in said space having their ends slidably received in the respective rails for mounting the leading edge clamping jaws for chordwise movement, said plungers having springs for urging them in the clamping direction, a trailing edge jaw set including a plurality of trailing edge supporting jaws extending into said slot and a plurality of cooperating trailing edge clamping jaws, a second set of plungers having ends slidably received in said rails for mounting the trailing edge clamping jaws, said plungers having springs for urging them in the clamping direction, the plungers of the first and second set being interspersed with one another and having their ends in axial alinement, a camshaft journaled in one of said rails, said camshaft having first and second sets of cam surfaces thereon for engaging the presented ends of the sets of plungers so that when the camshaft is rocked between two limit positions the plungers are pressed and released for respective releasing and clamping movement of the clamping jaws.

2. In a plate clamping mechanism for clamping a thin plate on a cylinder, the cylinder having a longitudinal groove formed in the surface thereof, the combination

comprising a hollow supporting rail structure seated in the groove and defining a clamp receiving space and a narrow access slot having angularly undercut edges, a leading edge jaw set having a reference jaw nested adjacent the undercut at the leading edge of the slot and a plurality of leading edge clamping jaws cooperating therewith, a first set of plungers having their ends slidably received in the rail structure for mounting the leading edge clamping jaws, a trailing edge jaw set including a plurality of trailing edge supporting jaws nested adjacent the undercut at the trailing edge of the slot and a plurality of trailing edge clamping jaws cooperating therewith, a second set of plungers having their ends slidably received in said rail structure for mounting the trailing edge clamping jaws, said plungers having springs for urging them in the clamping direction, the plungers of the first and second set being interspersed with one another and having their ends in axial alinement, a camshaft mounted in said rail structure, said camshaft having first and second sets of cam surfaces thereon for engaging the presented ends of the plungers so that when the camshaft is moved between two limit positions the plungers are pressed and released for respective releasing and clamping movement of the clamping jaws.

3. In a plate clamping mechanism for clamping a thin plate on a cylinder body having a groove formed therein, first and second rails seated in said groove secured together to form a smooth continuation of the surface of the cylinder and together defining a longitudinally extending clamp receiving space having a narrow access slot, the edges of said rails at the leading and trailing edges of the access slot having an angular undercut, a leading edge jaw set having a reference jaw tapered for nesting adjacent the leading edge undercut and having a plurality of spring biased clamping jaws, said reference jaw having a base portion seated in said space and having manually adjustable means for moving and skewing the same a slight amount for effecting register of the printing plate, a trailing edge jaw set including a pluraility of trailing edge supporting jaws tapered for nesting adjacent the trailing edge undercut and having spring biased clamping jaws, the clamping jaws for the leading and trailing edges being interspersed with one another and arranged side by side in said access slot, and means comprising a single longitudinal camshaft journaled in one of said rails for retracting said clamping jaws for insertion of the leading and trailing edges of the plate and for subsequently releasing them for clamping up said plate.

4. In a plate clamping mechanism for clamping a thin plate on a cylinder, the combination comprising means defining a longitudinally extending clamp receiving space having a narrow access slot at the periphery of the cylinder, a leading edge jaw set having a reference jaw and a plurality of leading edge clamping jaws with means for urging the latter into clamping position, a trailing edge jaw set including a plurality of trailing edge supporting jaws and cooperating trailing edge clamping jaws, said trailing edge clamping jaws having clamping springs for biasing them in the clamping direction and having fixed stops for limiting the movement in the clamping direction, said supporting jaws having springs for biasing them toward the clamping jaws, control means for holding the plate supporting jaws retracted against their associated springs for insertion of the trailing edge of the plate between the supporting and associated clamping jaws so that upon release of the control means each supporting jaw moves into engagement with its associated clamping jaw lifting the latter from its fixed stop and applying tension to the trailing edge of the plate.

5. In a plate clamping mechanism for clamping a plate on a cylinder, the combination comprising means defining a longitudinally extending clamp receiving space having a narrow access slot at the periphery of the cylinder, a leading edge jaw set in said space for clamping the leading edge of the plate, a trailing edge jaw set in said space including a plurality of trailing edge supporting jaws and cooperating trailing edge clamping jaws, springs coupled to said clamping jaws for pressing them in the direction of the supporting jaws, tensioning springs seated with respect to the cylinder for biasing the supporting jaws in the plate tensioning direction, control means engaging all of said supporting jaws for retracting them in a direction away from the clamping jaws, and stops interposed in the path of movement of the clamping jaws so that upon retraction of the supporting jaws the clamping jaws engage the stops to hold the jaws open for insertion of the trailing edge of the plate and so that when the plate supporting jaws are released by the control means for movement by the tensioning springs, the supporting jaws (1) come into bottoming engagement with the clamping jaws lifting the latter from their fixed stops for clamping of the trailing edge of the plate and (2) apply tensioning force to the plate.

6. In a plate clamping mechanism for clamping a thin plate on a cylinder, the combination comprising means defining a longitudinally extending clamp receiving space having a narrow access slot at the periphery of the cylinder, a leading edge jaw set in said space for clamping the leading edge of the plate, a trailing edge jaw set including a plurality of trailing edge supporting jaws and cooperating trailing edge clamping jaws, plungers connected to the trailing edge supporting jaws and mounted for chordwise movement, springs seated on said plungers for respectively biasing the clamping jaws in the direction of the supporting jaws, stops interposed in the paths of movement of the clamping jaws, plate tensioning springs on the respective plungers and control means for moving said plungers so that when the plungers are moved in one direction the clamping jaws are blocked by said fixed stops accompanied by compression of said springs and the opening of said jaws and so that when the plungers are moved in the return direction the supporting jaws move into clamping engagement with their associated clamping jaws thereby lifting the latter from their fixed stops and applying tension to the trailing edge of the plate.

7. In a plate clamping mechanism for clamping a thin plate on a cylinder, the combination comprising means defining a longitudinally extending clamp receiving space having a narrow access slot at the periphery of the cylinder, a leading edge jaw set having a reference jaw and a plurality of leading edge clamping jaws having associated clamping springs, a first set of plungers mounting said leading edge clamping jaws and having associated clamping springs for biasing the jaws together, a trailing edge jaw set including a plurality of trailing edge supporting jaws and cooperating trailing edge clamping jaws, a second set of plungers in said space mounting said supporting jaws and trailing edge clamping jaws, said second set of plungers having clamping springs for biasing the clamping jaws against the supporting jaws and having tensioning springs so that the associated supporting jaws and clamping jaws are together moved in a plate tensioning direction, the plungers in the first and second set being interspersed and arranged with their ends in longitudinal alinement, a camshaft extending longitudinally in said space and having first and second sets of cam surfaces thereon for operating the first and second set of plungers so that when the camshaft is rocked through a first portion of a revolution the first set of plungers is released for clamping the leading edge of the plate and so that when the camshaft is additionally rocked the second set of plungers is released for clamping the trailing edge of the plate and peripheral tensioning of the same.

8. In a plate clamping mechanism for clamping a thin plate on a cylinder, the combination comprising means defining a longitudinally extending clamp receiving space having a narrow access slot at the periphery of the cylinder, a leading edge jaw set having a reference jaw and a plurality of leading edge clamping jaws, a trailing edge jaw set including a plurality of trailing edge supporting

jaws and cooperating trailing edge clamping jaws, said clamping jaws having clamping springs for pressing the same to closed position, control means including a control member extending longitudinally in the cylinder for retracting said clamping jaws for insertion of the leading and trailing edges of the plate and for releasing them for clamping engagement, the control means being so arranged that upon moving the same in a direction to clamp the plate edges the leading edge clamping jaws are first actuated followed by actuation of the trailing edge clamping jaws, and means including tensioning springs for applying biasing force against the trailing edge supporting jaws for thereafter peripherally tensioning the trailing edge of the plate.

9. In a plate clamping mechanism for clamping a thin plate on a cylinder, the combination comprising a set of rails defining a longitudinally extending clamp receiving space having a narrow access slot at the periphery of the cylinder, a leading edge jaw set having a reference jaw and plurality of leading edge clamping jaws cooperating therewith, a trailing edge jaw set including a plurality of trailing edge supporting jaws and cooperating trailing edge clamping jaws, said clamping jaws having clamping springs for pressing the same to closed position, manually operable means in said rails for retracting the clamping jaws against the spring force for inserting the leading and trailing edges of the plate and for subsequently releasing them for clamping engagement, manually operable means in said rails for adjusting the peripheral position of the leading edge reference jaw, and springs for bearing upon the trailing edge supporting jaws for peripherally tensioning the trailing edge of the plate.

10. In a plate clamping mechanism for clamping a thin plate on a cylinder, the combination comprising means defining a longitudinally extending clamp receiving space having a narrow access slot at the periphery of the cylinder, a leading edge jaw set having a reference jaw and a plurality of leading edge clamping jaws, a trailing edge jaw set including a plurality of trailing edge supporting jaws and trailing edge clamping jaws, said clamping jaws having clamping springs for urging them to closed position, the surfaces defining the slot being angularly undercut on both sides of the slot to form an access space of trapezoidal section, said leading edge reference jaw and said trailing edge supporting jaws being tapered from a relatively thick base to a relatively narrow edge for nesting adjacent the undercut surfaces in converging relation, said clamping jaws being tapered in the direction of the slot from a relatively broad base to a narrow edge and arranged side by side in generally alternating fashion in the space between the reference jaw and the supporting jaws, means for retracting the clamping jaws against the spring force for inserting the leading and trailing edges of the plate and for subsequently releasing them for clamping engagement, and means including tensioning springs acting upon the trailing edge jaw set for peripherally tensioning the trailing edge of the plate.

11. In a plate clamping mechanism for clamping a thin plate to a cylinder, the combination comprising means defining a narrow access slot at the periphery of the cylinder, the edges of the slot being angularly undercut to provide an access space of trapezoidal cross section, a leading edge jaw set having a reference jaw and a plurality of leading edge clamping jaws, a trailing edge jaw set including a plurality of trailing edge supporting jaws and cooperating trailing edge clamping jaws, the reference jaw and supporting jaws being of tapered cross section respectively nested within the undercut edges of the slot and angled convergently inward to define a central space which is also of trapezoidal cross section, said clamping jaws being of generally triangular section for registering side by side in the central trapezoidal space while permitting limited peripheral movement therein, means for bodily adjusting the position of the reference jaw, clamping springs associated with each of said clamping jaws for normally urging the same into closed position, springs associated with each of the supporting jaws for urging the supporting jaws and their associated clamping jaws in a direction to tension the plate, and a single control member for compressing and thus temporarily defeating all of said springs for installation of a printing plate and for thereafter releasing said springs.

12. In a plate clamping mechanism for clamping a thin plate to a cylinder, the combination comprising rail means for recessing in the surface of the cylinder and hollowed out to define a longitudinally extending space having a narrow access slot and guide surface arranged generally opposite thereto, a leading edge jaw set including a reference jaw, said reference edge jaw having a pedestal extending along said guide surface and having clearance with respect to the rail means to provide for a limited amount of peripheral adjustment, adjusting blocks recessed in said rail means at the opposite ends of said pedestal, cam connections between the adjusting blocks and the ends of the pedestal, first adjusting means for moving said blocks in the same direction, second adjusting means for moving said blocks in opposite directions, said cam connections including oppositely angled surfaces so that the plate is peripherally adjusted for register upon operating the first adjusting means and skewed upon operating the second adjusting means, means including a plurality of leading edge clamping jaws each having individual clamping springs for clamping the leading edge of the plate, and a trailing edge jaw set including a plurality of individually mounted supporting jaws and cooperating clamping jaws having springs for clamping and tensioning the trailing edge of the plate.

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EUGENE R. CAPOZIO, *Primary Examiner.*