Dec. 20, 1960 T. R. ZIEBELL 2,965,024

PRINTING PLATE TENSION LOCKUP DEVICE

Filed Sept. 25, 1958 5 Sheets-Sheet 1

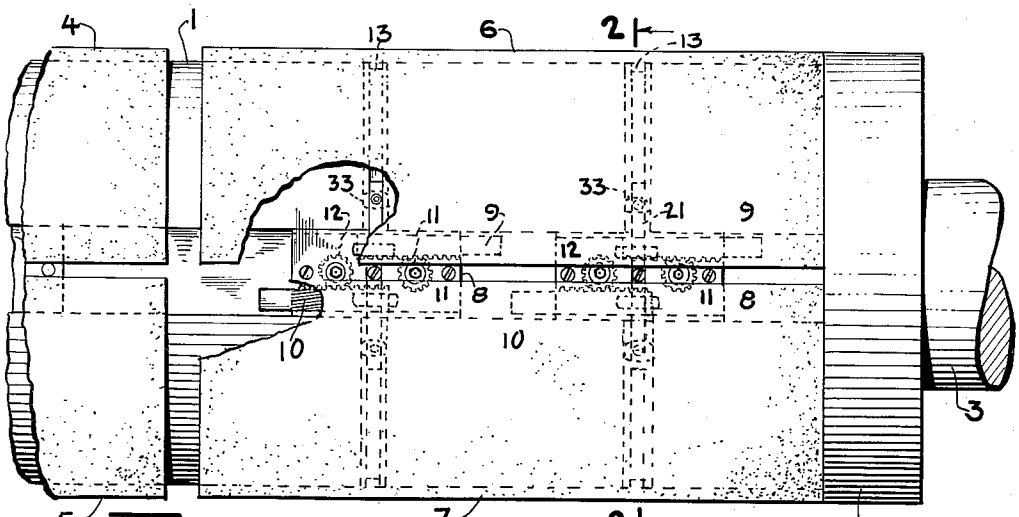


Fig. 1

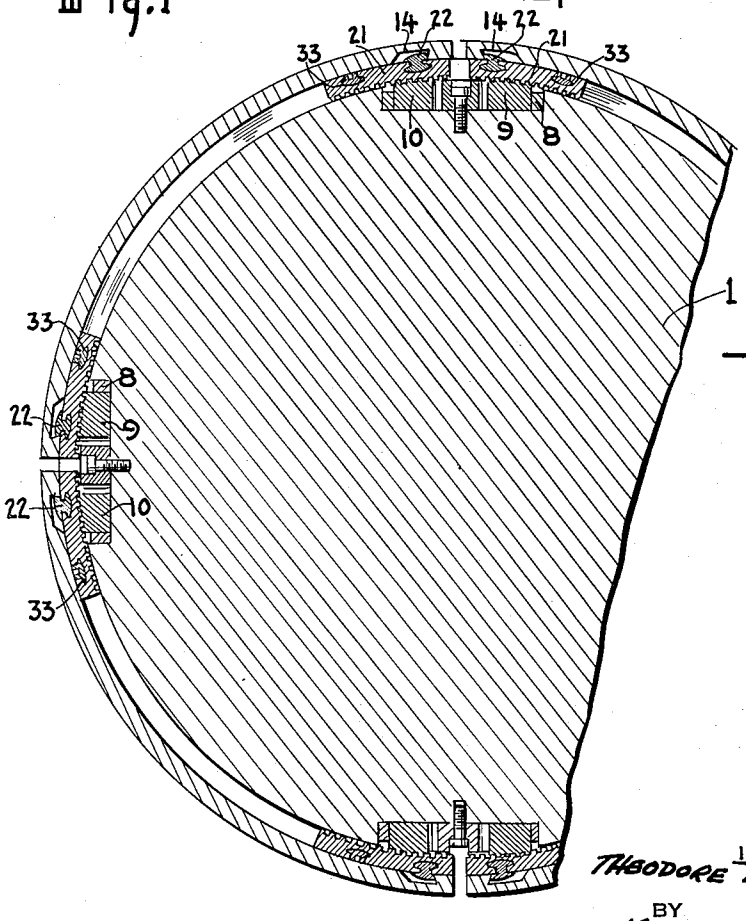


Fig. 2

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Filed Sept. 25, 1958 5 Sheets-Sheet 2

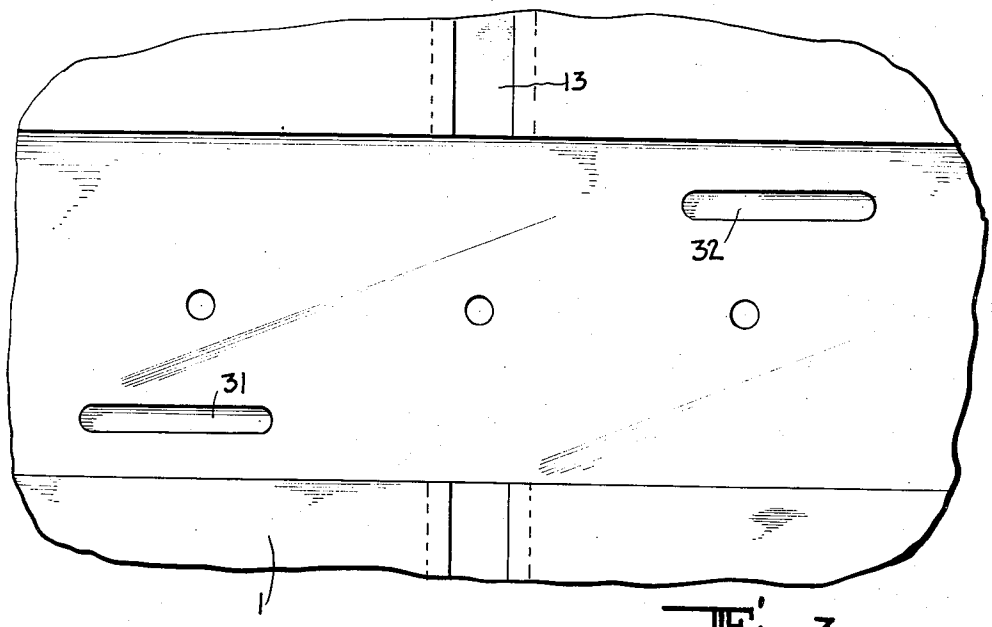


Fig. 3

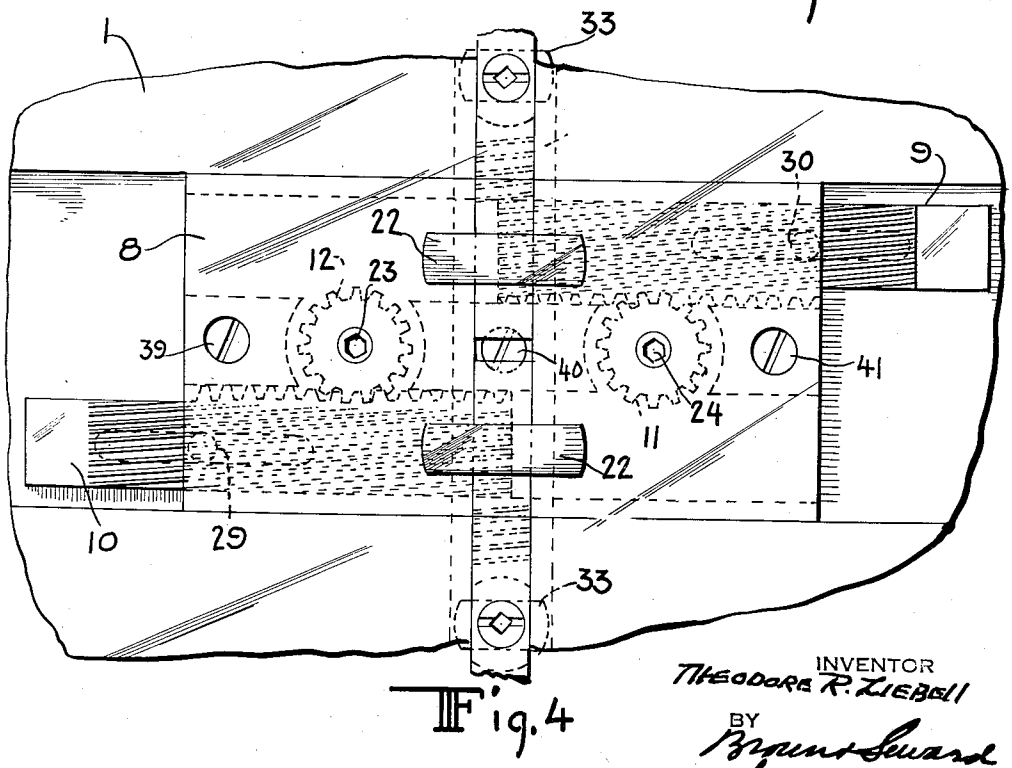


Fig. 4

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Dec. 20, 1960 T. R. ZIEBELL 2,965,024

PRINTING PLATE TENSION LOCKUP DEVICE

Filed Sept. 25, 1958 5 Sheets-Sheet 3

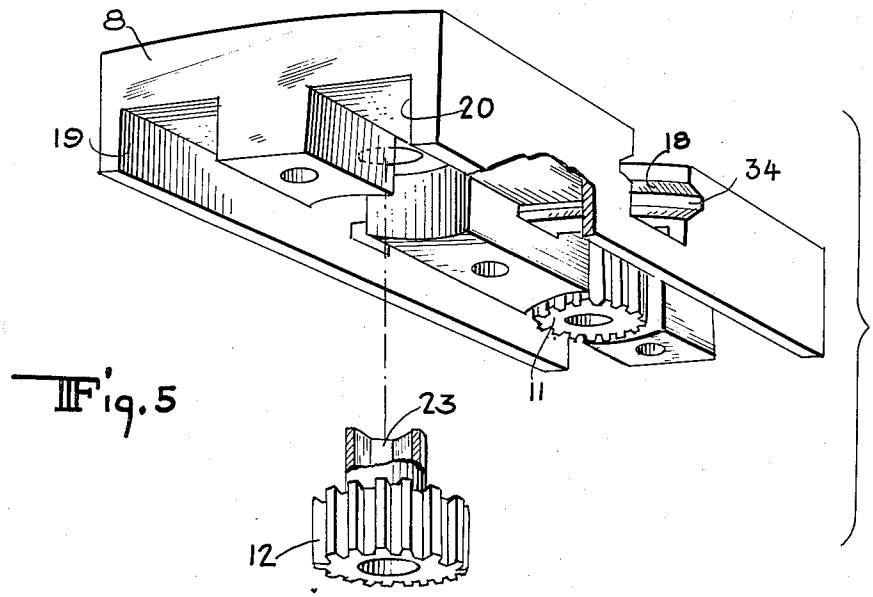


Fig. 5

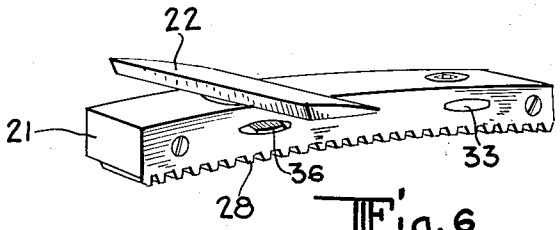


Fig. 6

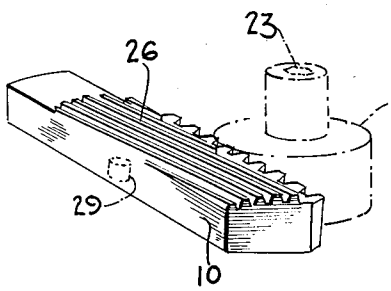


Fig. 7

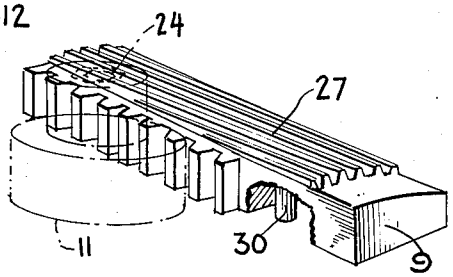


Fig. 8

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Dec. 20, 1960 T. R. ZIEBELL 2,965,024

PRINTING PLATE TENSION LOCKUP DEVICE

Filed Sept. 25, 1958

5 Sheets-Sheet 4

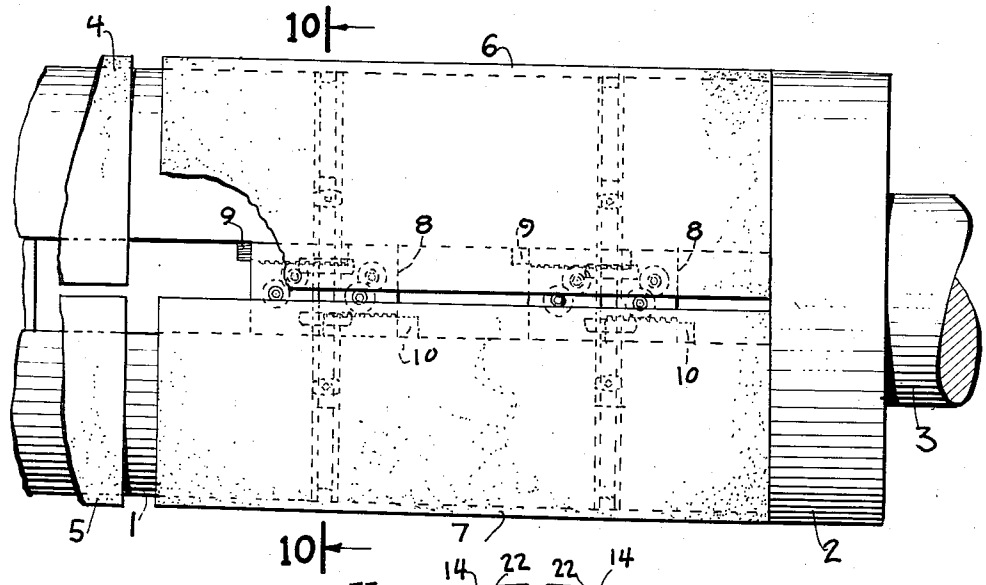


Fig. 9

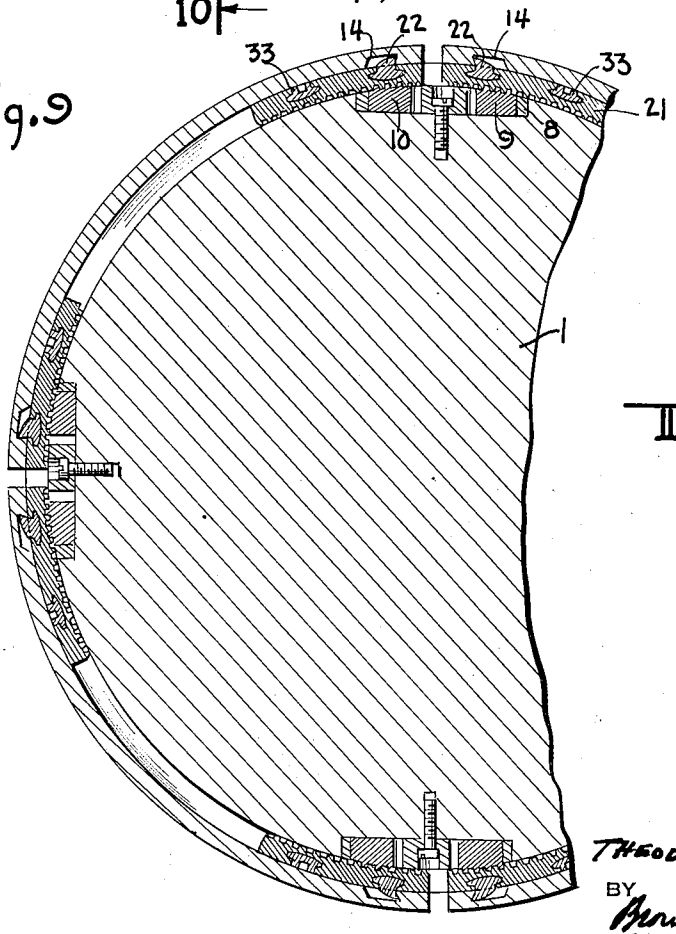


Fig. 10

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Dec. 20, 1960 T. R. ZIEBELL 2,965,024

PRINTING PLATE TENSION LOCKUP DEVICE

Filed Sept. 25, 1958 5 Sheets-Sheet 5

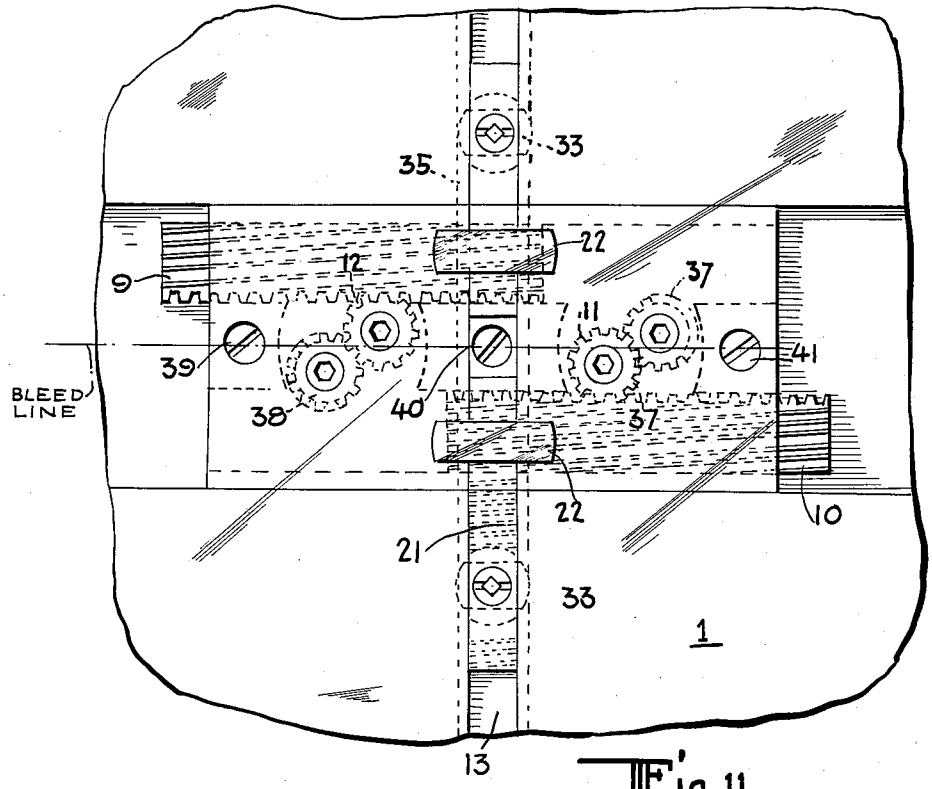


Fig. 11

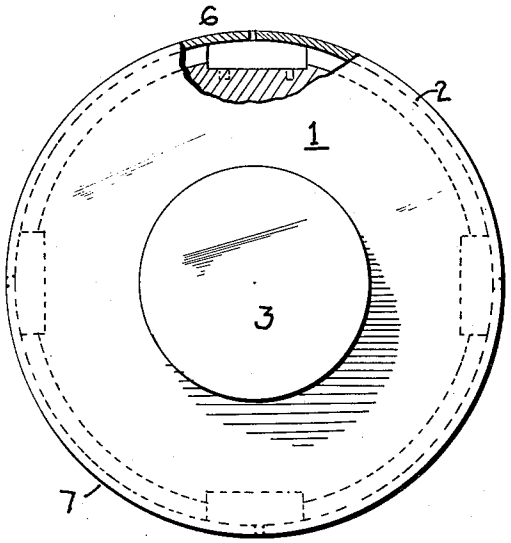


Fig. 12

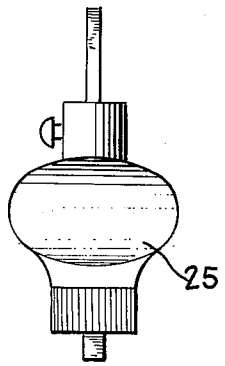


Fig. 13

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United States Patent Office

2,965,024

Patented Dec. 20, 1960

2,965,024

PRINTING PLATE TENSION LOCKUP DEVICE

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Filed Sept. 25, 1958, Ser. No. 763,272

6 Claims. (Cl. 101—378)

The invention relates to tension lockup mechanisms for plates used in connection with rotary printing presses in which each of said mechanisms is carried by a segment removably inserted in a cavity, or depression, in the circumference of a rotatable plate cylinder, being normally fixed therein by a plurality of screws or other suitable means.

My invention includes an integral segment in which are mounted at least one adjustable plate clamp together with means for actuating same, plus a further means for individually controlling each plate clamp and driving same in the desired direction, including situations wherein the plates are laid out to provide columns across rather than around the cylinder and the bleed runs to the center.

The object of my invention is to provide interchangeable units for printing press cylinders by which printing plates may be held thereon and positioned as desired, each of said units being provided with at least one movable plate clamp and means for actuating it.

Broadly, my invention provides a tension means for holding printing plates to their base, and adjusting same thereon, said means comprising an integral segment, means for removably fixing the segment in a cylinder surface, opposed movable racks located in said segment, pinions carried by the segment each operably engaged with a rack to move same, said racks being the actuating means for moving plate clamps engaged therewith, said clamps being provided with a rack surface on their bottoms and having swingable locking jaws for engagement with undercut scarfs in the leading and trailing edges of said printing plates for holding the latter to the cylinder under tension.

A modified form of my invention includes additional means carried by each segment for operating said first named pinions when the operating means for same are covered by specific plate arrangements such as bleed plates set up to print columns across. This modified form is so constructed that each plate clamp is individually adjustable, as in the principal form of my invention, for positioning plates on the cylinder, twisting same if necessary, and releasably tensioning same to the rotary printing cylinder.

Practical embodiments of my invention are shown in the accompanying drawings in which,

Fig. 1 represents a plan view, partly broken away, of a printing press plate cylinder carrying integral segments with their plate clamps and provided with the means for locking the segments to the cylinder, said segments carrying the operating mechanism for said plate clamps.

Fig. 2 represents a fragmentary section taken on the line 2—2 of Fig. 1, looking in the direction of the arrows, and illustrating lockup segments installed in the cylinder and for clamping a leading edge of one plate and a trailing edge of the adjacent plate to the cylinder under tension.

Fig. 3 represents a cylinder cavity for receiving a segment constructed according to my invention.

Fig. 4 represents a plan view of a segment removably fixed in operative position in a cylinder cavity.

Fig. 5 is a perspective bottom view of a segment showing the relationship of the grooves and of the pinions and plate clamp driving means.

Fig. 6 represents a plate clamp having its bottom in the form of a rack.

Fig. 7 is a perspective view of a moveable rack with its pinion shown in dotted outline.

Fig. 8 is a perspective view of the rack normally located opposite from that shown in Fig. 7.

Fig. 9 represents a fragmentary plan view of a modified form of my invention.

Fig. 10 represents a fragmentary section taken on the line 10—10 of Fig. 9 looking in the direction of the arrows.

Fig. 11 is a plan view of the form shown in Figs. 9 and 10 (plates removed).

Fig. 12 represents an end view, partly broken away showing a plurality of segments mounted in a cylinder, and

Fig. 13 represents in side elevation a key or suitable means for actuating the plate clamp locks and pinions.

Referring to the accompanying drawings, a rotary printing press plate cylinder is denoted by 1, the cylinder bearers by 2 and the cylinder drive shaft by 3. Shown in Fig. 1 are the usual printing plates 4, 5, 6 and 7, held to the cylinder under tension by means constructed according to my invention as will be set forth below.

A plurality of integral segments denoted by 8 are seated in cavities or slots located at predetermined positions in the surface of the cylinder 1. These segments have suitably machined channels 19 and 20 to receive toothed racks 9 and 10, said racks being slidably mounted in parallel relationship in the segments 8 and movable therein in channels 19 and 20 by means of pinions 11 and 12. It will be understood that each pinion operatively engages only one rack, the pinions being vertically mounted along the center line of the segment 8. The pinions 11 and 12 are identical in construction and each is rotatively mounted. Each shaft has a bore, 23 or 24, accessible from the top of the segment 8 for the insertion of a proper wrench or tool, such as that denoted by 25, to impart rotative movement to each pinion.

Each rack is provided on its upper surface with a section 26, 27 adapted to operatively engage a rack 28 on the bottom of each plate clamp body 21 which will be hereinafter described in more detail.

The segment 8 is suitably grooved on its upper surface with an undercut groove 18 which is adapted to match and form a continuation of a circumferential groove or slot 13 in the rotary printing plate cylinder 1.

The toothed racks 9 and 10 are adapted to slide in the cutouts 20 and 19 machined in the bottom of the segment 8, said cutouts being of a depth to intersect the groove 18 (which forms a continuation of the cylinder slots 13). Each slidable rack 9, 10 is provided on its bottom surface with a projecting stud 29, 30 adapted to travel in longitudinal cutouts 31, 32 in the cylinder 1 which prevents over travel of the slidable racks 9 and 10 when actuated through the rotation of a pinion as above described.

Located near each end of the groove 18 which coincides with a cylinder slot 13 as above set forth is a plate clamp 21 comprised of the following elements i.e., a body portion 21 having its bottom in the form of a rack 28 for engagement with the surface rack 26 (or 27) of a slidable rack heretofore mentioned, a double wing lock 33 to slidably hold the plate hook body in the said groove 18 by engaging the undercuts 34, 35 thereof, and a swingable plate engaging jaw 22 having a wing lock 36 formed in-

tegral therewith, the jaw and lock being swingable together.

It will be understood that each segment normally carries two of these plate hooks operable in opposed relationship so that one will engage the undercut trailing edge of a plate and its opposite member will engage the undercut leading edge of the adjacent plate.

In the modified form of my invention (Figs. 9–12 inclusive) which is used in a "columns across" layout where the bleed is to the center and the product is to be saddled stitched, the segment outer body is identical with that previously described as are the sliding racks, segment grooves and the plate clamps. However, in order to provide access to the driving means for the pinion heretofore described additional pinions **37**, **38** with access to the pinion shaft for operating same, are provided as shown in Fig. 11. Thus, by actuating an additional pinion (**37** or **38**) which is operatively engaged with the pinion (**11** or **12**) heretofore described, its slidable rack member (**9** or **10**) is caused to move across the bottom **28** of a plate clamp body **21** thereby causing same to move into or out of engagement with the undercut scarf of the plate either in its leading or trailing edge as the case may be.

It will be understood that the plate clamps are denoted generally by **21** and are interchangeable.

The operation of the double wing locks by the use of one end of tool **25** (Fig. 13) is performed in the usual manner by merely inserting the proper end of the tool from the top and turning same until the wings of the lock engage the undercuts either in the cylinder groove or slots **13** or the segment top undercut groove **18**.

As can be seen from the several figures these segments **8** are interchangeable and can be spaced across the center as desired. They are normally held to the cylinder by a plurality of screws such as **39**, **40** and **41**, it being understood that any well known or approved securing means may be used in lieu of these screws.

The unit is assembled by placing the pinions in their respective recesses and the slidable members **9** and **10** in their respective grooves, and then placing the segment **8** in the cylinder cavity and securing same as described above. The desired plate clamps **21** are dropped into the undercut grooves **13** or **18** as the case may be moved into contact with a slidable rack and slidably locked by turning the double wing lock **33** to engage the undercuts of these grooves or either of them.

By rotating the available pinions it will be seen that the slidable members **9** or **10** are reciprocated and, since an upper rack surface engages their bottom rack surface of the respective plate clamps the latter are moved in the desired direction.

As the plates are placed on the cylinder so that the plate engaging jaws are received in the undercuts of the respective plates, it will be seen that the travel of the plate clamps along their grooves will engage or disengage the plate jaws with the plate undercuts to releasably tension the plates to the cylinder.

It will be understood that any suitable tool may be used either to rotate the pinions or the double wing lock. The wing lock formed integral with the plate engaging jaw obviously moves with this jaw.

The plate engaging jaw is rotatable in order that it may accommodate itself to any discrepancies in the plate undercuts when engaged therewith.

It will also be understood that since each plate clamp is individually movable that the plate may be urged in any desired direction by the actuation of the desired plate clamp or clamps.

Since it is obvious that changes may be made in the form, construction and arrangement of the several parts

without departing from the spirit and scope of my invention I do not intend to be limited to the particular embodiments herein shown and described except as set forth in the appended claims.

What I claim is:

1. In a rotary printing dress the combination with a plate cylinder having surface cavities and circumferential undercut grooves therein and printing plates adapted to be tensioned on said cylinders, said plates having undercuts on the bottom adjacent their leading and trailing edges, of a plate tension lockup mechanism for tensioning said plates to the cylinder comprising, at least one integral segment, means for removably fastening a segment in a cylinder cavity, an undercut top lateral groove in said segment matching its undercut circumferential cylinder surface groove, two longitudinal channels in the bottom of the segment, said channels intersecting said segment top lateral groove, a slidable member in each bottom channel, and having top and side racks, pinions mounted in the segment in mesh with said side racks for individually moving said members along said channels, said pinions being adapted to receive an actuating tool therein, plate clamps movably mounted in said lateral top segment groove and having bottom racks in operative engagement with their respective top racks of the said slidable member and driven thereby, and a swingable plate engaging jaw on each plate clamp, said jaw being carried into and out of engagement with a plate undercut for releasably tensioning the plate to the cylinder as said clamp is actuated.

2. A combination according to claim 1 in which a stop is provided on each slidable member for limiting the travel thereof in its segment channel.

3. A combination according to claim 1 in which the means for moving each said slidable member comprises at least one pinion in operative engagement therewith, said pinion being mounted in said segment and provided with a recess for receiving an operating tool to actuate the pinion, and, therefrom, a slidable member and the plate clamp operatively engaged thereby.

4. A combination according to claim 1 in which the means for driving each slidable member comprises a plurality of pinions said pinions being operable from the top surface of the segment to move the slidable member and the plate clamp operatively engaged thereby.

5. A combination according to claim 1 in which driving pinions for each slidable member are arranged along an axis angled with respect to the longitudinal axis of the segment.

6. A combination according to claim 1 in which the parallel channels in the bottom of the segment intersect the top undercut groove in said segment at right angles and the slidable members engage the plate clamps to move same across said intersections.

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