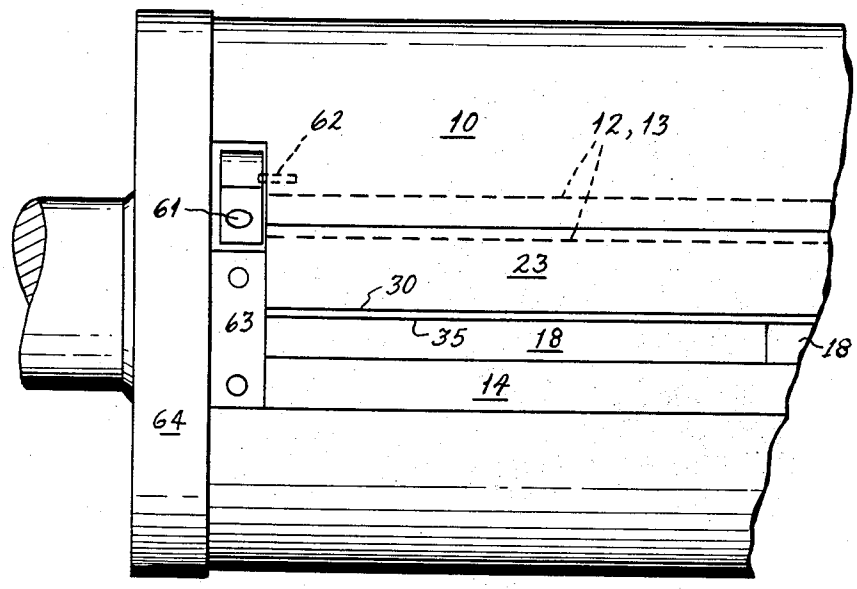
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PRINTING MACHINE PLATE LOCK-UP

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Fig. 1



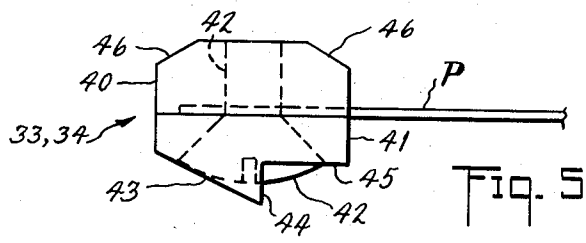


Fig. 5

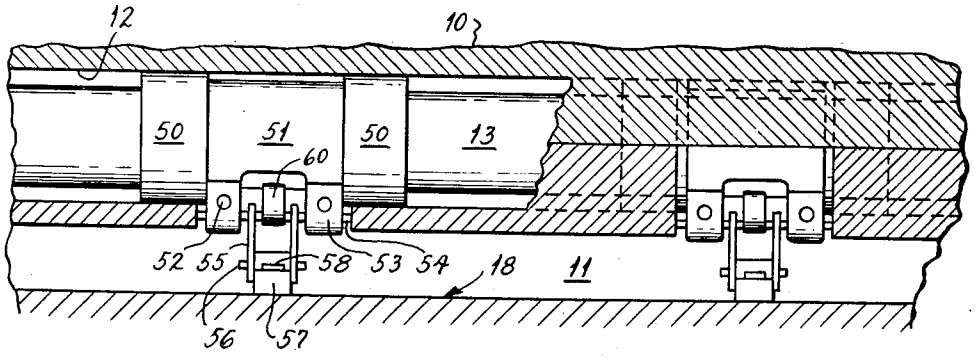


Fig. 4

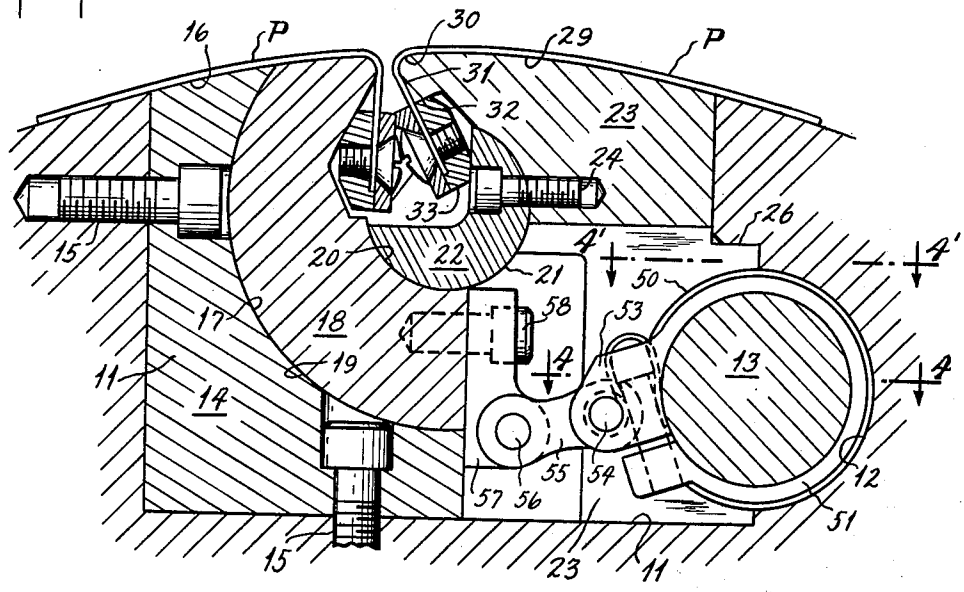
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Fig. 2



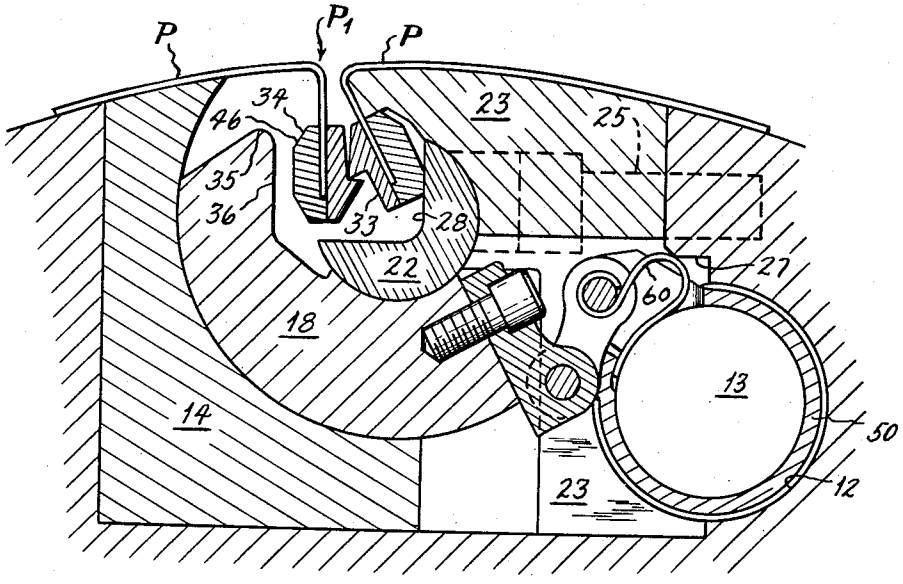


Fig. 3

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United States Patent Office

2,946,282

Patented July 26, 1960

2,946,282

PRINTING MACHINE PLATE LOCK-UP

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Filed Apr. 20, 1954, Ser. No. 424,364

7 Claims. (Cl. 101—415.1)

This invention relates to plate lock ups for web printing machines, and more particularly to lock ups for relatively thin plates such as are used in offset printing and which are required to be held and tensioned on a plate or printing cylinder.

In such machines it is desirable to have only a small gap in the plate surface at the point of attachment of its ends to the cylinder, the plate must be firmly held under as even tension as possible and the operation of inserting and removing a plate should be as simple and quick as possible. The general object of the present invention is to provide an improved plate lock up mechanism fulfilling these requirements to the fullest extent.

A lock up embodying the invention in a preferred form will now be described in detail with reference to the accompanying drawing, and the features forming the invention will then be pointed out in the appended claims.

In the drawings:

Fig. 1 is a diagrammatic plan view of one end of a cylinder embodying the invention in a preferred form;

Fig. 2 is an enlarged cross section through the plate holding mechanism of the cylinder of Fig. 1 as viewed looking toward the left;

Fig. 3 is a view similar to Fig. 2, but showing the parts in a different position;

Fig. 4 is a plan view to about half the scale of Fig. 2, showing associated support elements as broken away to the planes 4—4 and 4'—4' of Fig. 2 to the left and right, respectively;

Fig. 5 is a detail end elevation of a plate end clamp assembly used for holding the plate end.

The cylinder **10** may be of any desired size and construction generally. It is formed with a generally rectangular channel **11** for holding the plate operating mechanism, and with a bore **12** communicating with this channel to one side thereof and accommodating the plate lock up operating shaft **13**.

The operating parts comprise a block **14** fitting in the groove and held therein by screws **15**, this block having a convex arcuate surface **16** forming part of the cylinder surface and a concave arcuate or cylindrical surface **17** upon which rotates one or more movable lock up members **18** each formed with a corresponding cylindrical bearing surface **19**. On wide machines several short lock up members **18** may be used instead of one long member. Concentric with the surfaces **17** and **19** is a concave cylindrical surface **20** of the members **18** which cooperates with the cylindrical surface **21** of a bar **22**. The bar **22** is fixed to a support member or block **23** by screws **24**, the block **23** being fixed in the channel **11** by screws **25** and further held therein by a shoulder **26**, which fits under an overhanging ledge **27** formed on one wall of the channel **11**. The bar **22** is formed at one side with a groove having a generally radial wall **28** for a purpose described below. The block **23** has a cylindrical surface **29** forming part of the cylinder periphery and ending in a rounded nose **30** around which the plate passes. Inwardly of the rounded edge or nose **30** the block **23** is

formed with a flat section **31** and with a shoulder **32** at right angles thereto. A plate end clamp designated generally at **33** fits against the shoulder **32** and the wall **28** as later described. Each lock up member **18** is formed with generally similar arrangements for holding a second end clamp member designated generally at **34**, and these include the rounded edge **35** and a flat surface **36**, the end clamp member **34** sitting against the latter.

The plate P is a generally rectangular metal sheet, as usual, to the ends of which are attached the plate end clamps **33** and **34**. Each end of the plate proper is clamped between bars **40** and **41**, fastened together by screws **42**, so as to firmly grip the plate. Bar **41** is formed with a bevel surface **43** shown as being at about 30° to the plate, with the right angle shoulder **44** and with a flat **45**. Bar **40** is formed with bevels **46** at the same angle to the plate as bevel **43** or a degree or two less, and is flat and parallel to the plate between these bevels. The end clamp **33** at one end of the plate and the end clamp **34** at the other, have their screws **42** opposite each other, when in locked up position, and the clearance between the screw heads is reduced as shown, to a point where it is impossible for either screw to loosen materially, since the screws are practically in contact.

In locking up the plate, the plate end clamps **33** and **34** are placed as shown in Fig. 3, with the shoulders **44** hooked or engaged together. The natural elasticity of the plate which is bent as indicated at P1 serves to hold the end clamps **33** and **34** in engagement as shown. The locking up is accomplished (by mechanism later described) by rotating the member **18** (clockwise) from the position of Fig. 3 to that of Fig. 2. The rounded gap edge **35** engages the plate P at about the location of P1, gradually forces it into its final position and the surface **36** engages the upper or outer bevel **46** on the clamp **34** forcing this element toward the cooperating clamp **33**. In the final position, as shown in Fig. 2, the clamp **34** is firmly wedged in place between the surface **36** and the cooperating clamp **33** and this element, in turn, is firmly forced against shoulder **32** and flat surface **28**. An exceptionally simple and reliable plate lock up is thus provided. It will be noted that the plate where it passes over the rounded gap edges **30** and **35** is subjected to little or no abrasion. The only frictional movement around the gap edge **30** is that involved in the tightening of the plate around the cylinder circumference. With respect to the gap edge **35**, this edge initially engages the plate at substantially the same place as it engages it in locked up position, so there is practically no bending movement of the plate. It thus becomes possible to apply considerable tension to the plate around the cylinder without tensioning it excessively adjacent its edges where it passes into the cylinder gap.

The means for rotating the members **18** comprise the shaft **13** previously referred to. At intervals along the length of this shaft, it is provided with bearing bushings or sleeves **50**, between each pair of which there is located a split collar or screw clamp **51** held together by screws or bolts **52** and upon which is formed a fork **53** carrying a pin **54** on which is pivotally mounted a pair of chain side links or plates **55**, the other ends of which are pivotally attached to a member **18**, by means of a pin **56** passing through a block **57** which is fixed to the member **18** by screw **58**. A spring **60** may pass around the pin **54** and engage against shaft **13** as indicated for the purpose of taking up slack or backlash in this mechanism and insuring equal distribution of the turning force on the members **18**. The end of operating shaft **13** is provided with a socket **61** (Fig. 1) to take a wrench for turning the shaft and may be held in locked up position by means of a spring detent or other catch member

62. The cylinder end is closed off by filler block 63 and bearer 64.

By using a plate registering table such as is disclosed in Patent 2,234,170 the plate end clamps 33 and 34 may be accurately positioned and secured to each end of a printing plate, and the plate then bent at the proper places, so that when it is locked up on the cylinder it will fit perfectly and be properly tensioned.

What is claimed is:

1. In a printing machine plate cylinder for flexible plates and having a gap for receiving the plate ends, plate holding mechanism comprising a plate holding member forming an edge of the cylinder gap and an adjacent part of the cylinder plate supporting surface, means mounting the member for angular movement between plate holding position and a retracted gap opening position, the plate holding member having a plate end engaging surface which is substantially smooth and which diverges inwardly from a radial plane including the said gap edge when in plate holding position to hold a plate end by wedging action, a plate having an end in the gap and free to move therein and cooperating plate holding means holding the plate end against the said substantially smooth surface and thereby wedging it radially inward and holding it in the cylinder.

2. Plate holding mechanism according to claim 1, in which the means mounting the plate holding member comprises a shaft extending its length and the plate holding member has a concave cylindrical surface engaging the said shaft.

3. Plate holding mechanism according to claim 2, in which the said shaft has a groove for accommodating the opposite end of a plate.

4. Plate holding mechanism according to claim 3, in which the concave cylindrical surface and substantially smooth plate engaging surface of the plate engaging member are adjacent.

5. A printing machine plate cylinder comprising, in combination, a cylinder having a gap, a plate holding member forming one edge of the gap and rotatively movable between plate holding position and a retracted gap opening position, a cooperating plate holding member having a ledge for engaging a plate end fitting to hold it radially of the cylinder, the first said plate holding member having a substantially smooth plate end engaging surface, and a flexible plate having end fittings formed to interlock when one end fitting is placed under the ledge, the plate is wrapped around the cylinder and the other end fitting is placed against it, whereby the plate may first be temporarily attached to the cylinder by interlocking of the said end fittings and then secured thereto by rotating the first mentioned plate holding member to wedge the end fittings together.

6. A printing machine plate cylinder according to claim 5, in which a rotative axis of the first said plate holding member is located in a radial plane spaced from the gap edge of the said member in the direction of the gap, whereby the said member is kept within the profile of the cylinder in its movement between plate engaging position and retracted gap opening position.

7. A printing machine plate cylinder according to claim 6, in which the said rotative axis is located to bring the said gap edge into pressure contact with the plate along substantially the same line as the line of engagement in plate holding position.

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