Dec. 15, 1959 E. H. DU BOIS 2,916,990

INK PAD TENSIONER FOR STENCIL DUPLICATORS

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Fig. 1.

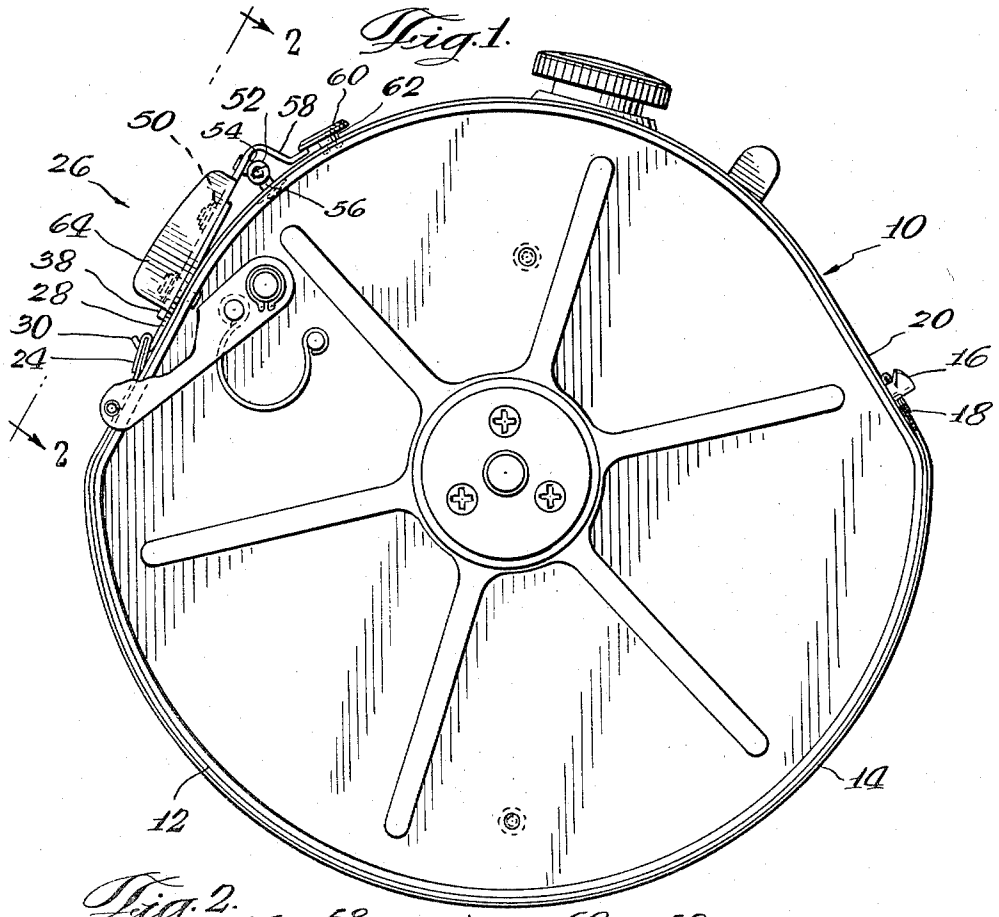
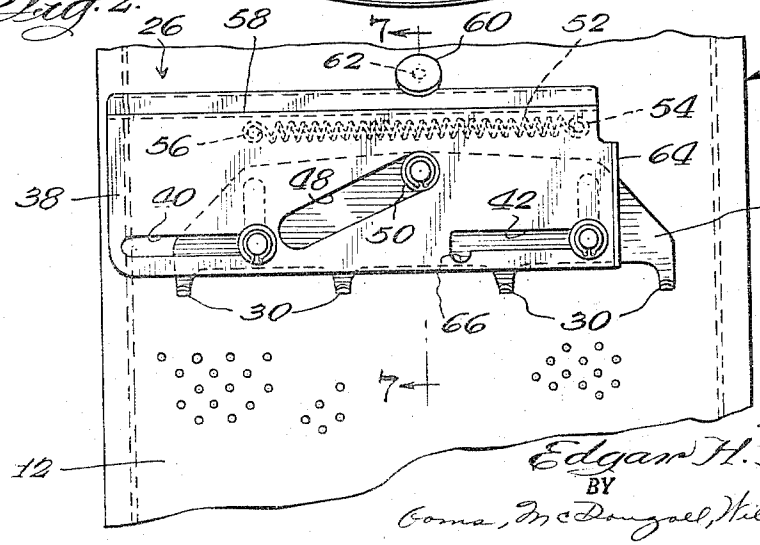


Fig. 2.



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Fig. 3.

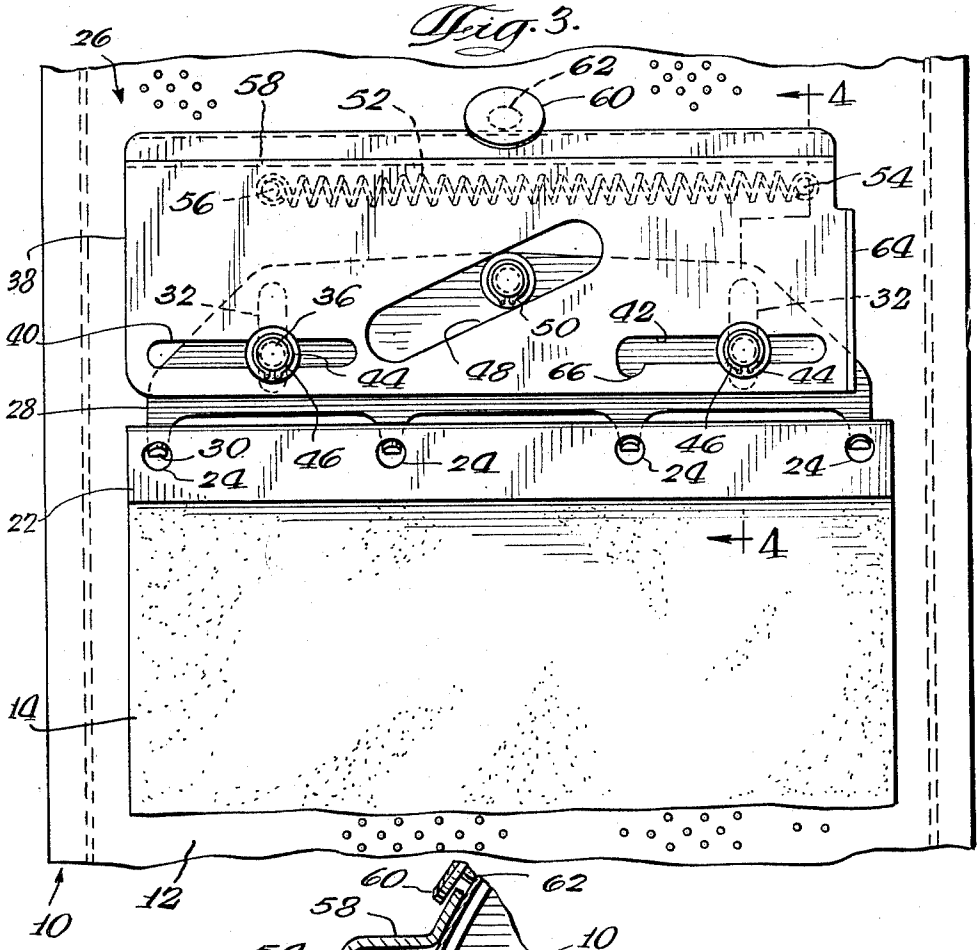
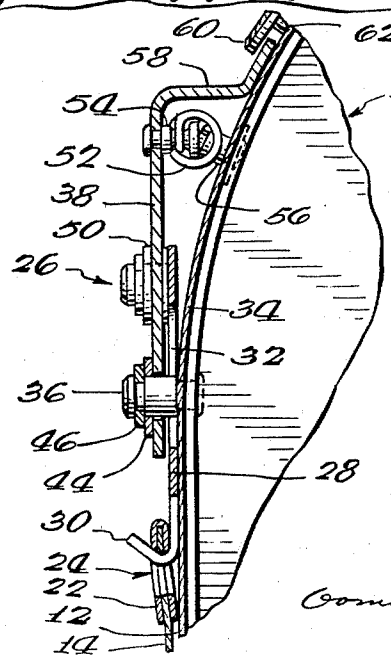


Fig. 4.



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Fig. 6.

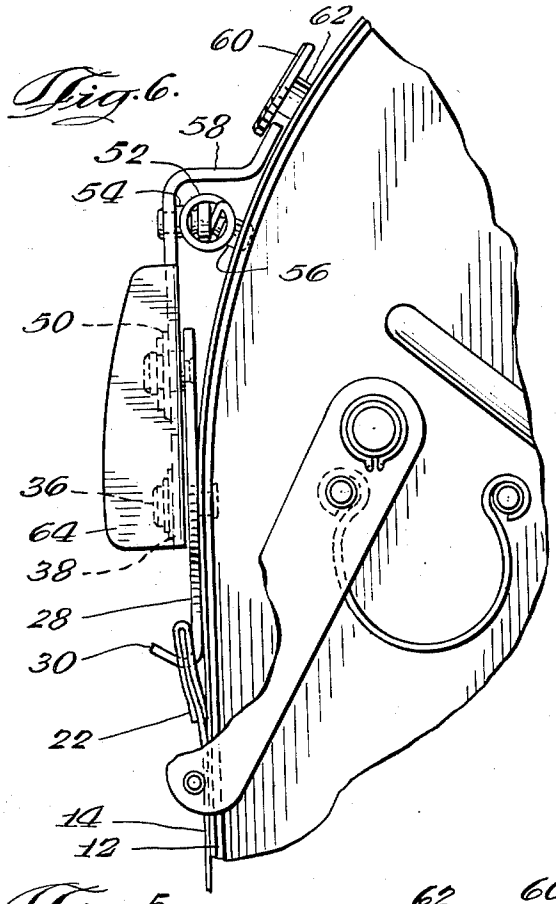


Fig. 7.

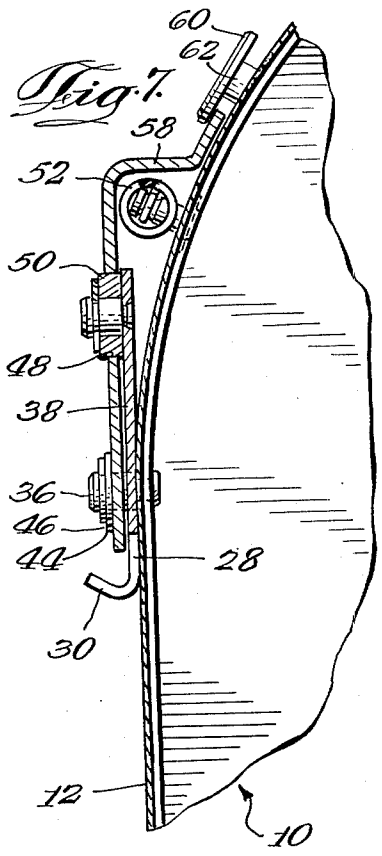
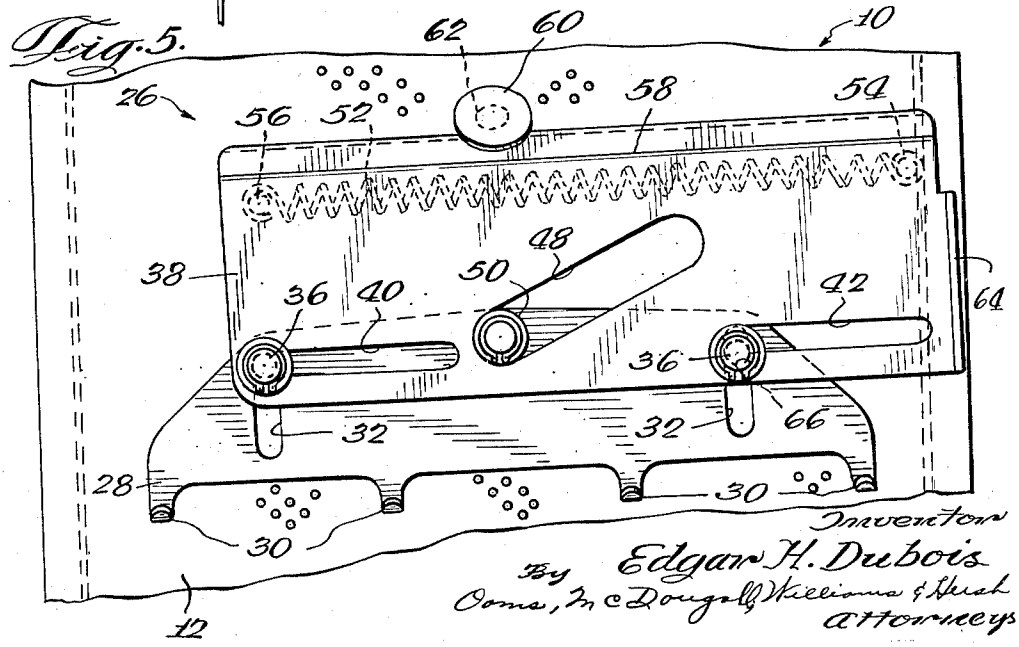


Fig. 5.



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INK PAD TENSIONER FOR STENCIL DUPLICATORS

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Application September 11, 1957, Serial No. 683,397

1 Claim. (Cl. 101—415.1)

This invention relates to duplicators or other printing machines and pertains particularly to stencil duplicators in which a stencil is wrapped around an ink pad which is held under tension on a printing drum or cylinder.

One object of the present invention is to provide a new and improved mechanism for holding an ink pad under tension on the printing drum of a stencil duplicator.

Another object is to provide a new and improved ink pad tensioning mechanism which is easy to operate so that the operator may readily remove and replace the ink pad.

A further object is to provide an ink pad tensioning mechanism which is arranged to distribute the tension evenly on the ink pad along its width.

Another object is to provide a new and improved ink pad tensioning mechanism which is easy to manufacture and low in cost.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings, in which:

Fig. 1 is an end view of a printing drum or cylinder for a stencil type duplicator, equipped with an ink pad tensioning mechanism to be described as an illustrative embodiment of the present invention.

Fig. 2 is a fragmentary elevational view of the tensioning mechanism, taken generally as indicated by a line 2—2 in Fig. 1, the mechanism being shown in its rest position, occupied when there is no ink pad on the drum.

Fig. 3 is a view somewhat similar to Fig. 2, but on a larger scale and with the mechanism in its normal operating position, with an ink pad being held under tension by the mechanism.

Fig. 4 is a fragmentary enlarged section view taken generally along a line 4—4 in Fig. 3.

Fig. 5 is a view somewhat similar to Fig. 3, but with the mechanism in its ink pad releasing position.

Fig. 6 is a fragmentary end view showing the tensioning mechanism with parts of the cylinder broken away.

Fig. 7 is a fragmentary enlarged sectional view, taken generally along a line 7—7 in Fig. 2.

It will be seen that the drawings illustrate an ink drum or cylinder 10 for a stencil type duplicator. It will be recognized that cylinder 10 is of the closed type forming a tank or reservoir adapted to hold a supply of ink. A large part of the peripheral surface of cylinder 10 is formed by a cylindrically curved, perforated diaphragm 12. An ink pad 14 may be wrapped around the perforated diaphragm 12 and may be tensioned on the cylinder 10 by means to be described in detail shortly. A printing master in the form of a stencil (not shown) may be wrapped around the cylinder 10 over the ink pad 14. It will be understood that the ink passes from the inside of the drum 10 through the perforated diaphragm 12 and wets the ink pad, so that the ink pad becomes saturated with ink. The ink from the ink pad passes through the openings in the stencil and is transferred to copy sheets which are pressed against the drum 10 in the course of the printing operation.

The present invention is concerned with the manner in which the ink pad 14 is held under tension on the printing drum 10. At its head end, the ink pad 14 is simply anchored by being hooked over a plurality of studs, or hooks 16, which are securely mounted on the drum 10. Thus, the studs 16 are immovable with respect to drum 10. An apertured bar 18 is secured to the head end of the ink pad 14 and is adapted to be hooked over the studs 16. The studs are mounted on a wall 20 which is receded in position with respect to the extended circle of the diaphragm 12 so that the studs will not come into contact with the copy sheets or other parts of the duplicating machine.

The tail end of the stencil 14 is also fitted with a reinforcing bar 22, made of sheet metal or other suitable material. A plurality of apertures 24 are formed in the bar 22 and are distributed along the width of the ink pad 14. The tail end of the ink pad 14 is adapted to be held on the drum 10 by a mechanism 26 which is adapted to tension the ink pad.

The tensioning mechanism 26 comprises an elongated hook plate or member 28 formed with a plurality of hooks 30 adapted to be received in the openings 24 provided in the bar 22. The hook plate 28 is arranged to extend longitudinally of the printing drum 10 and is disposed in a receded position with respect to the extended circle of the diaphragm 12. The hooks 30 are aligned with each other along a line extending longitudinally of the printing drum 10 and are spaced longitudinally along the length of the drum, with a spacing corresponding to that of the openings 24.

The hook plate 28 is guided for sliding movement in a generally peripheral direction with respect to the printing drum 10. In this case, the hook plate 28 is formed with a pair of elongated slots 32 which extend in a generally peripheral direction and are parallel to each other. The plate 28 is supported over and is slidable along a supporting wall 34 which recedes from the periphery of the diaphragm 12. Guide pins 36 are mounted on the wall 34 and are arranged to extend outwardly through the slots 32. The fit between the pins 36 and the slots 32 may be fairly loose so that the hook plate 28 will be freely movable.

The hook plate 28 is adapted to be moved by means of an elongated operating plate or member 38. As shown, a portion of the operating plate 38 overlies a portion of the hook plate 28. The operating plate 38 extends lengthwise of the cylinder and is guided for lengthwise sliding movement. Thus, the illustrated operating plate 38 has a pair of elongated slots 40 and 42 which extend lengthwise of the cylinder 10. The guide pins 36 extend outwardly through the longitudinal slots 40. Washers 44 and clips 46 may be mounted on the pins 36 to retain the operating plate 38 thereon. The fit between the pins 36 and the slots 40 and 42 is sufficiently loose to permit free movement.

In order that the hook plate 28 may be moved peripherally in response to the longitudinal movement of the operating plate 38, a cam 48 is arranged to act between the plates 28 and 38. In this case, the cam 48 takes the form of an elongated diagonal slot in the operating plate 38. The slot 48 is adapted to be followed by a roller or pin 50 which is mounted on the hook plate 28 and extends outwardly into the slot 48. When the operating plate 38 is moved longitudinally, the diagonal cam slot 38 induces peripheral movement of the hook plate 28.

By means of a spring 52, the operating plate 38 is normally urged in one longitudinal direction so as to bias the hook plate 28 in a direction such as to tension the ink pad 14. Thus, the spring 52 tends to move the operating plate 38 to the left, as shown in Fig. 3, and thereby tends to draw the hook plate 28 upwardly. In

this case, the spring **52** is of the coil spring type and is tensioned between a pin **54** or the like on the operating plate **38** and a pin or other anchor **56** on the cylinder wall **34**. It will be observed that the spring **52** extends longitudinally of the cylinder between the operating plate **38** and the cylinder wall **34**.

At its upper edge, the operating plate **38**, as shown in Figs. 3 and 4, is formed with a generally L-shaped flange **58** which spaces the upper portion of plate **38** from the cylinder wall **34**, so as to provide room for the spring **52**. The extreme edge of the flange **58** is retained and guided under an enlarged head **60** which is formed on a stud **62** mounted on the cylinder wall **34**. In this way, the upper edge of the operating plate **38** is kept from swinging away from the cylinder wall **34**. The fit between the flange **58** and the stud **62** is quite loose so as to provide for free and easy movement of the operating plate **38**. At its right-hand end, the operating plate **38** is formed with an upstanding flange **64** which serves as a handle or manually moving the operating plate **38**.

When the operating plate **38** is moved to the right, as shown in Figs. 3 and 5, the hook bar **28** is moved in a direction to relax the tension in the ink pad **24** and eventually release the ink pad.

In Fig. 5, the tensioning mechanism **26** is shown in its pad-releasing position with the operating plate **38** moved fully to the right. In order to detain the mechanism in this position, while the ink pad is being removed or replaced, the slot **42** is formed with a detent notch **66** at its left-hand end. The notch **66** extends in a peripheral direction and downwardly as seen in Figs. 3 and 5. When the operating plate **38** is fully moved to the right, as seen in Fig. 5, the right-hand end of the plate may be swung upwardly to engage the notch **66** with the right-hand guide pin **36**. The engagement between the notch **66** and the guide pin **36** will retain the operating plate **38** in the pad-releasing position until the operator swings the right-hand end of the operating plate downwardly. It will be understood that the fit between the headed stud **62** and the upper edge of the operating plate **38** is sufficiently loose to permit the slight upward swinging movement which is involved in engaging the notch **66** with the pin **36**. In the course of such swinging movement, the operating plate **38** pivots about the left-hand guide pin **36**.

Fig. 2 illustrates the pad-tensioning mechanism **36** in its rest position occupied when there is no ink pad on the printing drum **10**. In this position, the operating plate **38** is moved fully to the left by the spring **52**, and the hook plate **28** is moved fully in an upward direction.

When the ink pad is to be installed on the drum **10**, the head end of the ink pad is hooked over the studs **16** and the pad is wrapped around the diaphragm **12**. The operating plate **38** is then fully moved to the right, to move the hook plate **28** fully in a downward direction, as shown in Fig. 5. The operating plate is swung upwardly so as to engage the notch **66** with the right-hand pin **36**. This detains the operating plate in its pad-releasing position. The apertured bar **22** at the head end of the ink pad **14** may then be mounted on the hooks **30**.

Tension is applied to the pad **14** by swinging the operating plate **38** downwardly to release the notch **66** from the pin **36**. The operating plate **38** is then allowed to return to the left under the force of the spring **52**. The hook plate **28** is drawn upwardly until the ink pad **14** is drawn tight around the diaphragm **12**. The spring **52** maintains tension on the ink pad **14** at all times. Fig. 3 shows the tensioning mechanism **26** in its normal operating position with the pad **14** held under tension.

It will be seen that the diagonal cam slot **48** supplies the tensioning force to the hook plate **28** through the medium of the roller **50**. The hook plate **28** is free to pivot sufficiently about the roller **50** to equalize the tension on the various hooks **30**. Thus, the engagement between the guide slots **32** and the pins **36** prevents any substantial movement of the hook plate **28** in a lengthwise direction with respect to the cylinder **10** but the fit between the slots and the pins is sufficiently loose to permit the hook plate **28** to rock or pivot about the axis of the roller **50**. Such freedom for pivoting movement assures that the tension in the ink pad **14** will be evenly distributed along the width of the pad.

It will be recognized that the tensioning mechanism is extremely easy to operate yet is highly effective in tensioning the pad. Moreover, the tensioning mechanism is easy to manufacture and low in cost.

Various modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention as exemplified in the foregoing description and defined in the following claim.

I claim:

In a stencil type duplicator, the combination comprising a printing cylinder for receiving an ink pad and a stencil, means for anchoring one end of the ink pad to the cylinder, a hook plate for securing the opposite end of the ink pad to the cylinder, said hook plate having a plurality of hooks thereon spaced along the length of the cylinder for connection of the ink pad to said plate, said hook plate being disposed on said cylinder along the length thereof, a plurality of parallel slots in said plate, said slots being elongated and arranged to extend in a generally peripheral direction with respect to said cylinder, a plurality of guide pins secured to said cylinder and extending outwardly through said slots to guide said plate for generally peripheral movement on said cylinder, an elongated operating plate extending longitudinally of said cylinder over said hook plate, said operating plate having a plurality of elongated slots therein extending lengthwise of said cylinder and received over said guide pins to guide said operating plate for movement longitudinally of said cylinder, said operating plate having an elongated generally diagonal cam slot therein, a follower roller mounted on said hook plate and extending into said cam slot for moving said hook plate peripherally in response to longitudinal movement of said operating plate, a spring urging said operating plate in one longitudinal direction to bias said hook plate in a peripheral direction such as to tension the ink pad, said operating plate being movable in the opposite direction against the force of the spring to release the ink pad, and a notch formed adjacent to one end of one of said guide slots in said operating plate for receiving the corresponding guide pin to detain said operating plate in its pad-releasing position.

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