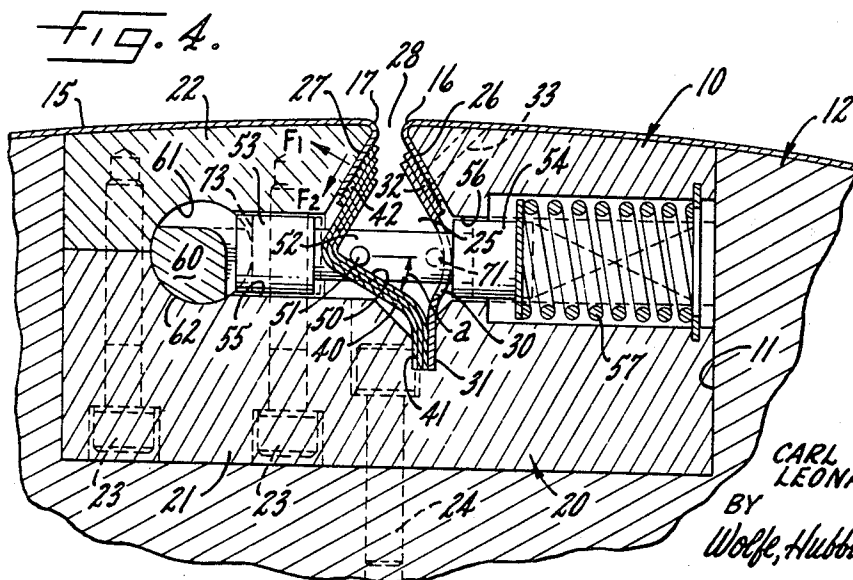
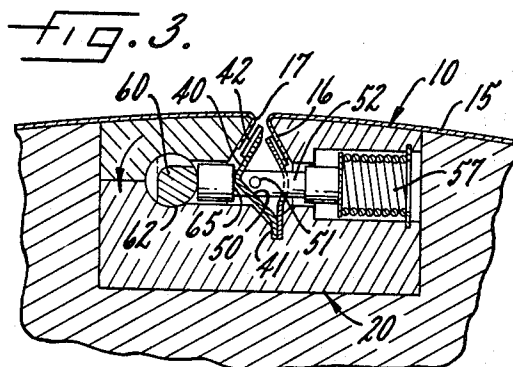
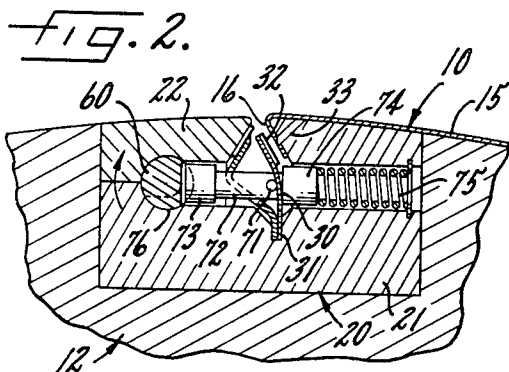
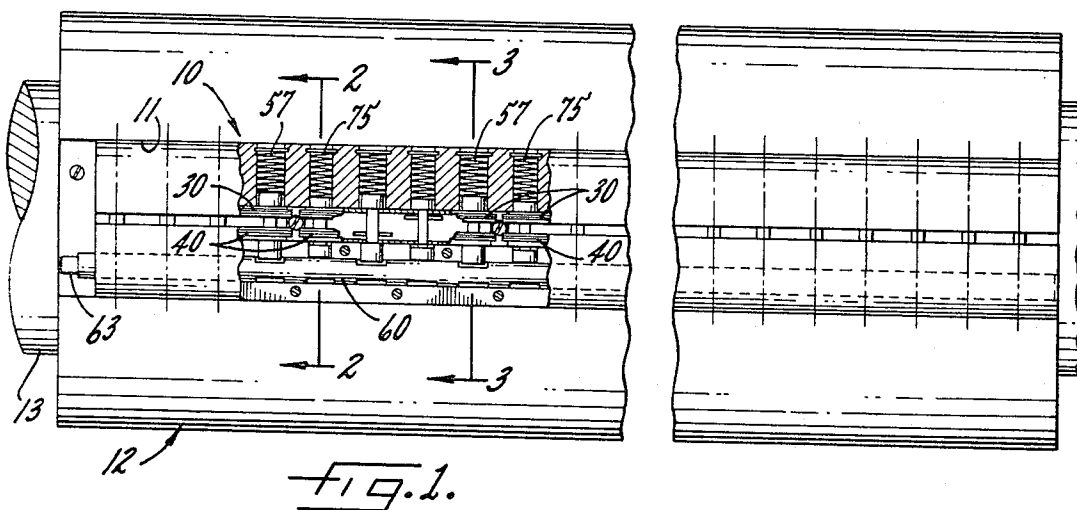


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CONTINUOUS TAKE-UP CLAMPING ARRANGEMENT FOR  
BLANKET IN PRINTING PRESS  
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## CONTINUOUS TAKE-UP CLAMPING ARRANGEMENT FOR BLANKET IN PRINTING PRESS

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### ABSTRACT OF THE DISCLOSURE

A cylinder for a blanket in a printing press in which the ends of the blanket are received in a groove having an access slot and an undercut seating surface with a leaf spring for gripping the end of the blanket and a take-up spring for applying force against the leaf spring so that the latter applies a first component normal to the surface and a second component along the surface to take up any slack developing in the blanket under running conditions.

Generally stated it is an object to provide a clamping arrangement for a blanket in a printing press which is reliable, completely safe, and easily operated. It is a more specific object of the present invention to provide a novel clamping arrangement for securing the leading and trailing edges of the blanket which is capable of continuous and automatic take-up of any slack which may develop in the blanket, for example, as a result of a long continuous run. It is a related object to provide a clamping arrangement having novel means for releasing and engaging the leading and trailing edges in which there is positive clamping action at the leading edge and resilient take-up at the trailing edge, with the jaws at both edges under the control of a single control member.

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 face view of a clamping assembly constructed in accordance with the present invention, foreshortened, and with portions broken away to reveal the internal construction;

FIG. 2 is a transverse section taken along the line 2—2 in FIG. 1;

FIG. 3 is a transverse section taken along the line 3—3 in FIG. 1;

FIG. 4 is a view similar to FIG. 3, somewhat enlarged, showing the clamps at the leading and trailing edges under running conditions.

Turning now to the drawings, FIGURE 1 shows a clamping assembly 10 recessed in a groove 11 formed in an impression cylinder 12 having hubs 13. The cylinder is covered with a blanket 15 of suitable material having a leading edge 16 and a trailing edge 17. In operation, the impression cylinder 12 cooperates with a plate cylinder (not shown) against which it bears to serve as a back-up for the web being printed.

The clamping assembly 10 includes a block or body 20 which, for convenience, may be formed of a first member 21 and a second member 22 fastened together by cap screws 23. The body may be secured to the cylinder by a set of screws 24 extending through the bottom of the body. The members 21, 22 together form a central cavity 25 having an undercut seating surface 26 for seating the leading edge of the blanket and under cut surface 27 for seating the trailing edge, such surfaces being separated by a narrow access slot 28.

For the purpose of clamping the leading edge of the blanket, leading edge clamping springs 30 are provided anchored at 31 in the bottom of the cavity and having a blanket gripping surface 32 opposed to the seating surface 26. It will be understood that a plurality of the clamping

springs 30 are used arranged side by side and having individual gripping surfaces. To insure retention of the leading edge of the blanket, the seating surface 26 is penetrated at spaced intervals by pins 33 presenting sharpened points on which the leading edge of the blanket is impaled while being held by the gripping surfaces.

In somewhat similar fashion a plurality of trailing edge clamping springs 40 are provided, in the form of leaf springs, anchored, or pivoted, at 41 in the bottom of the recess and having blanket gripping surfaces 42 on their free ends.

In accordance with the present invention the clamping force at the trailing edge is augmented by take-up springs having an associated cam and cam follower for applying two components of force to the trailing edge of the blanket, a first component which holds it against the seating surface and a second component which acts inwardly along the seating surface to take up any slack in the blanket which may be developed as a result of continuous running. More specifically in accordance with the invention, the clamping springs at the trailing edge of the blanket are bowed to provide a camming surface, and cam followers are provided in the form of plungers which are movable endwise under the urging of the take-up springs so that any yielding at the edge of the blanket, due to development of the slack caused by constant running, results in take-up movement at the gripping surfaces to maintain the blanket tight on the cylinder. Thus, referring to FIG. 4, a typical trailing edge clamping spring indicated at 40, is bowed, by bending either smoothly or abruptly, to form a camming surface 50. Such camming surface is engaged by a cam follower 51 which is in the form of a pin transversely fitted in a plunger 52 which extends through the cavity 25. The plunger has end portions 53, 54 which are slidable in bores 55, 56 formed in the body 20. Bearing against the end 54 of the plunger is a take-up spring in the form of a coil spring 57.

The plunger 52 is movable in a direction which is generally perpendicular to the spring 40, taken as a whole, and, because of the angling of the surface 50 of the spring and the direction of the plunger movement, a force is applied to the clamping spring along a line which is angularly related to the trailing edge seating surface. Thus, the force which is produced at the seating surface has, as indicated in FIG. 4, a first component F1 which is perpendicular to the seating surface and which thus holds the trailing edge of the blanket seated, and a second component which is parallel to the surface and which is in such direction to pull the trailing edge of the blanket inwardly. Thus it will be seen that the take-up spring 57 performs a dual function; not only does it augment the force of the clamping spring 40 to hold the trailing edge, but it also serves to apply a constant inward pull upon the trailing edge. Since the seating surface 27 is stationary, any take-up movement of the plunger is accompanied by additional bowing of the clamping spring which it engages.

In accordance with one of the more detailed features of the construction, the angle  $\alpha$  which exists between the cam surface on the clamping spring and the direction of plunger movement may be made sufficiently shallow so that the plunger cannot retrogress. This insures that movement at the gripping surface 42 will be in the inward, or blanket-tightening, direction only under the urging of the force  $F_2$ .

Since a plurality of clamping springs 40 are provided along the trailing edge of the blanket, each having a plunger 52 and take-up spring 57, the clamping and take-up action will be the same at all the regions of clamping along the trailing edge. This not only insures that the trailing edge of the blanket is securely held along its length but individual clamping springs and plungers may act as needed to take up any localized slack.

For the purpose of simultaneously releasing all of the clamping springs at the trailing edge and compressing their associated take-up springs, a control member in the form of a cam shaft is provided extending through the body 20 and positioned to engage the ends of all of the plungers 52. In the present instance this is accomplished by a cam shaft 60 which rotates in a bore 61 and which has, aligned with each of the plungers 52, relieved areas defining camming surfaces 62. The end of the shaft is squared as shown at 63 for turning by a wrench or the like. When the shaft is rotated in a counterclockwise direction as indicated at FIG. 3, the cam surfaces 62, engaging the end of the plungers, move the plungers to the right, compressing the springs 57 and retracting the cam followers 51. At the same time, a lifting surface 65 on each plunger engages the front surface of the associated clamping spring causing it to be lifted clear of the seating surface 27 and permitting the trailing edge of the blanket to be withdrawn.

The same cam shaft which serves to retract the clamping springs at the trailing edge is also utilized to clamp, or produce retraction of, the clamping springs at the leading edge. Thus, as shown in FIG. 2, each of the leading edge clamping springs 30 has an associated clamping pin 71 mounted on a plunger 72 having ends 73, 74. The end 74 is engaged by a return spring 75. Thus when the shaft is turned to the position shown in FIG. 2, the plunger 72 is released, and the clamping springs 30 are retracted so that the leading edge of the blanket may be inserted or removed. The portion of the cam shaft aligned with each of the plungers 72 is relieved to define cam surfaces 76. When the cam shaft is rotated to bring the cam surfaces 76 into engagement with the ends of the plungers, the plungers are moved forcing the pins 71 to engage the clamping springs 30, bowing them as shown in FIG. 4. Since all of the springs 30 are simultaneously clamped, the leading edge of the blanket is positively held.

While the operation of the clamping assembly will be apparent in view of the foregoing description, it may be helpful to summarize it briefly. With the cam shaft rotated to the position shown in FIG. 2, the clamps at the leading edge of the blanket are retracted permitting the leading edge to be inserted to the position shown. The cam shaft is then rotated to the condition shown in FIG. 3 which causes clamping at the leading edge and retraction of the clamps at the trailing edge, permitting the trailing edge to be inserted as shown. Following this the cam shaft is rotated to the position shown in FIG. 4 which releases the clamping and take-up springs so that they are effective to clamp the trailing edge. In the event that any slack is developed, each of the pins 51 rides along its surface 50 producing a component of inward movement to draw the blanket inwardly so that the slack is taken up. Reversing the sequence of movement of the cam shaft permits the ends of the blanket to be withdrawn and a new blanket to be inserted. In the case of large cylinders it will be understood that several of the disclosed clamping mechanisms may be used for clamping separate blanket sections. The term "blanket" shall be understood to be a general one including various packings, sheets, or coverings which may be employed on a printing press cylinder. The term "leaf spring" shall be understood to cover a spring formed of a leaf of spring metal having any desired number of layers. The term "outwardly bowed" will be understood to mean bowing in such direction that application of force to the center portion to effect gripping is accompanied by an increase in the degree of curvature or bow.

We claim as our invention:

1. In a cylinder having a groove in the surface extending lengthwise thereof, a clamping assembly having an elongated body fitted in the groove including sides defining a longitudinally extending cavity having an access slot, means in said cavity for clamping the leading edge of the blanket, an undercut seating surface in the

cavity for seating the trailing edge of the blanket, a clamping spring in the form of a leaf spring secured at the bottom of the cavity and having a blanket gripping surface at its free end in opposed relation to the seating surface, means including a take-up spring for applying force to the clamping spring in such a direction that two components of force are applied by the gripping surface upon the trailing edge of the blanket, one component normal to the seating surface and a second component inwardly along the seating surface, so that upon development of any slack in the blanket under running conditions, the gripping surface undergoes movement in a direction to take up the slack.

2. In a cylinder having a groove extending lengthwise thereof, a clamping assembly having an elongated body fitted in the groove including sides defining a longitudinally extending cavity having an access slot, means in said cavity for clamping the leading edge of a blanket, an undercut seating surface in the cavity adjacent the slot for seating the trailing edge of the blanket, a clamping spring in the form of an outwardly bowed leaf spring secured at the bottom of the cavity and having a blanket gripping surface at its free end in opposed relation to the seating surface, means including a take-up spring bearing upon the center portion of the clamping spring, and control means for permitting application of force by the take-up spring against the clamping spring to increase the degree of bowing thereby to produce relative inward movement of the blanket gripping surface along the seating surface for takeup of slack in the blanket.

3. The combination as claimed in claim 2 in which a force transmitting connection is interposed between the take-up spring and the clamping spring for applying force to the clamping spring at an angle producing a first component of force at the gripping surface normal to the surface and a second component directed inwardly for taking up slack which may develop in the blanket under running conditions.

4. The combination as claimed in claim 2 in which a cam and cam follower are interposed between the take-up spring and the clamping spring for applying two components of force to the gripping surface.

5. The combination as claimed in claim 2 in which the clamping spring is bowed to provide a camming surface thereon having an associated cam follower connected to the take-up spring, the cam follower being guided for movement along a path at an angle to the cam surface which is sufficiently shallow as to obviate retrograde movement, and means for manually releasing the clamping spring for insertion or removal of the trailing edge of the blanket.

6. The combination as claimed in claim 2 in which the clamping spring is bowed to provide a camming surface having an associated cam follower, a plunger for mounting the cam follower for movement in a direction at an angle to the camming surface, the take-up spring being arranged to press against the plunger, and means for manually retracting the plunger against the force of the take-up spring for separating the gripping surface from the seating surface for insertion and removal of the trailing edge of the blanket.

7. The combination as claimed in claim 2 in which the clamping spring is bowed to provide a camming surface, a plunger mounted for movement generally at right angles to the clamping spring, a pin projecting laterally from the plunger and engaging the camming surface, the take-up spring being arranged to press against the plunger, and a cam shaft engaging the end of the plunger for manually retracting the same against the force of the take-up spring for separating the gripping surface from the seating surface for insertion and removal of the trailing edge of the blanket.

8. In a cylinder having a groove extending lengthwise thereof, a clamping assembly having an elongated body fitted in the groove including sides defining a longitudinal

5

ly extending cavity having an access slot, means in said cavity for clamping the leading edge of the blanket, an undercut seating surface in the cavity adjacent the slot for seating the trailing edge of the blanket, a plurality of bowed clamping springs secured at the bottom of the cavity and having extensive blanket-gripping surfaces at their free ends in opposed relation to the seating surface, a plurality of plungers for engaging the bowed springs respectively mounted for movement generally perpendicular to the springs and having respective take-up springs and manually operated means for simultaneously compressing all of said take-up springs and for simultaneously lifting all of said clamping springs from the seating surface for insertion and removal of the trailing edge of the blanket.

9. The combination as claimed in claim 8 in which the manually operated means is in the form of a cam shaft extending the length of the body and having a set of cam surfaces thereon for engaging the ends of the plungers for moving them simultaneously in a direction to retract the clamping springs.

10. In a cylinder having a groove extending lengthwise thereof, a clamping assembly having an elongated body fitted in the groove including sides defining a longitudinally extending cavity having an access slot, leading and trailing edge seating surfaces adjacent the slot and in undercut relation with respect thereto for seating the leading and trailing edges of a blanket, a set of leading edge

6

clamping springs mounted in the bottom of the cavity and having gripping surfaces at their free ends opposed to the leading edge seating surface, a set of trailing edge clamping springs anchored at the bottom of the cavity and having gripping surfaces at their free ends opposed to the trailing edge seating surface, means including a set of plungers arranged in a plane substantially perpendicular to the clamping springs for engaging the latter, take-up springs for bearing against the plungers associated with the trailing edge clamping springs for applying force thereto under running conditions and means including a cam shaft having cam surfaces thereon for engaging the ends of the plungers for moving the same in a direction to retract the clamping springs for insertion and removal of the leading and trailing edges of the blanket.

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