May 9, 1950 G. B. HIRSCH 2,507,470

BOBBIN CASE REMOVING AND REPLACING MECHANISMS FOR SEWING MACHINES

Filed Oct. 17, 1946 3 Sheets-Sheet 1

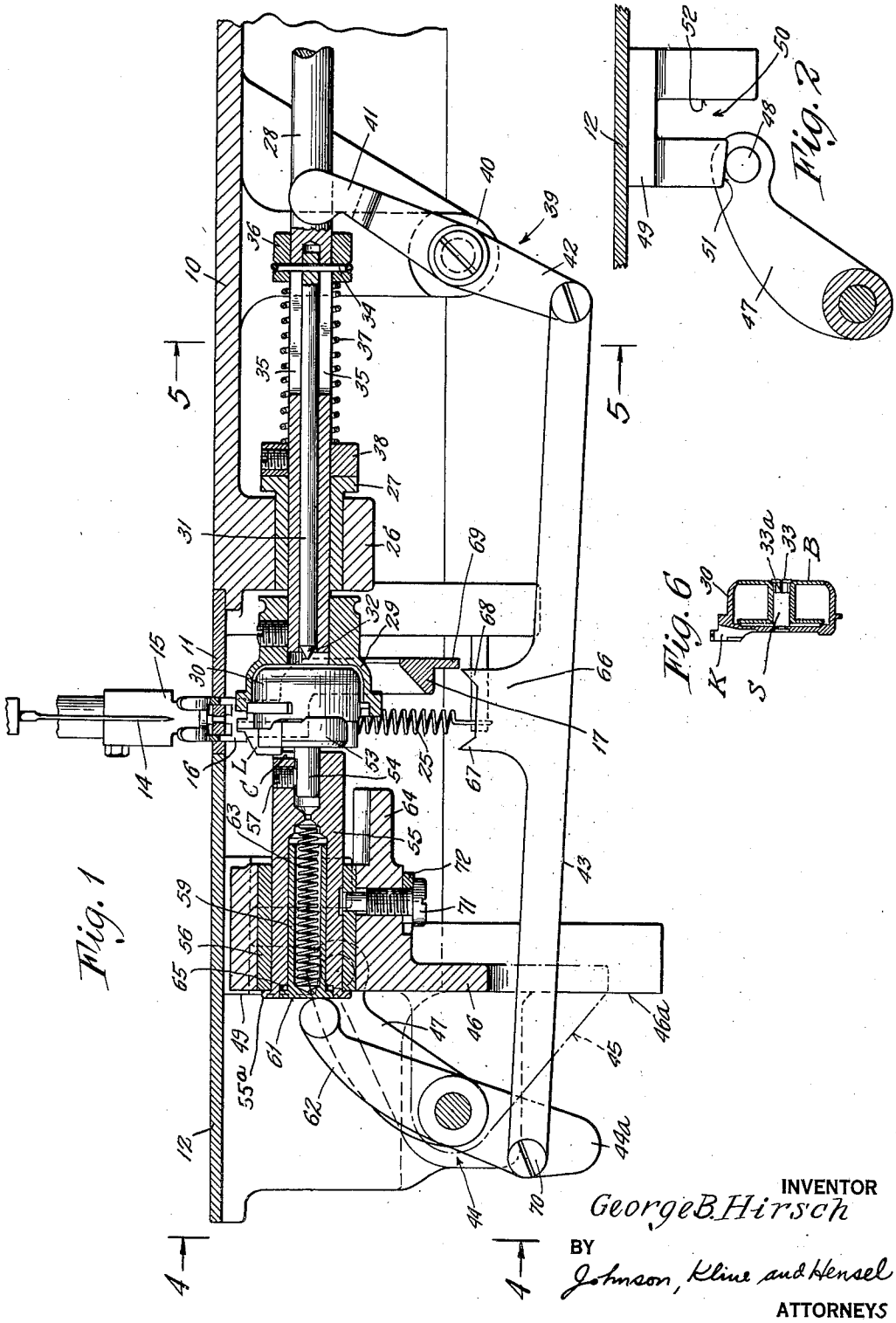


Fig. 1

Fig. 2

Fig. 6

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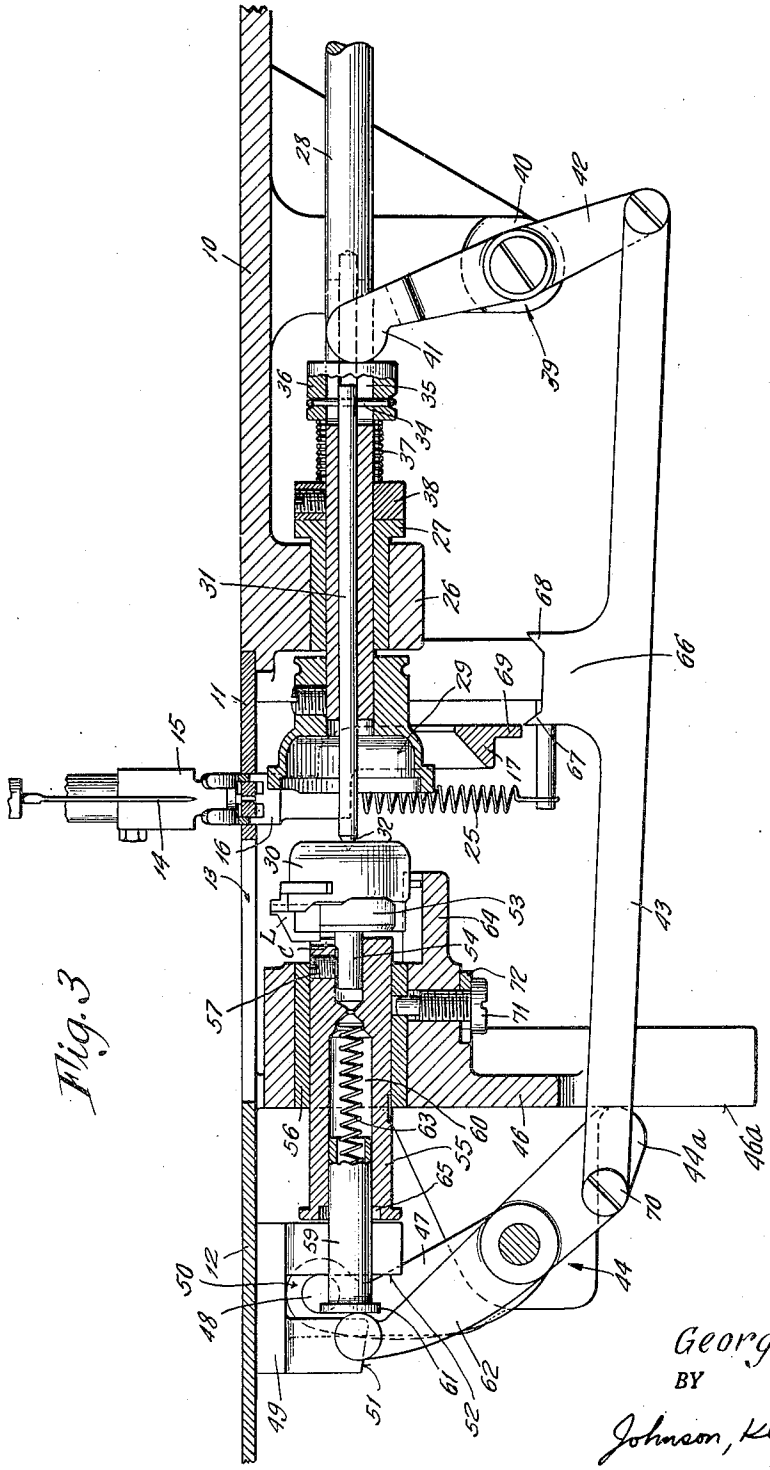


Fig. 3

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Fig. 4

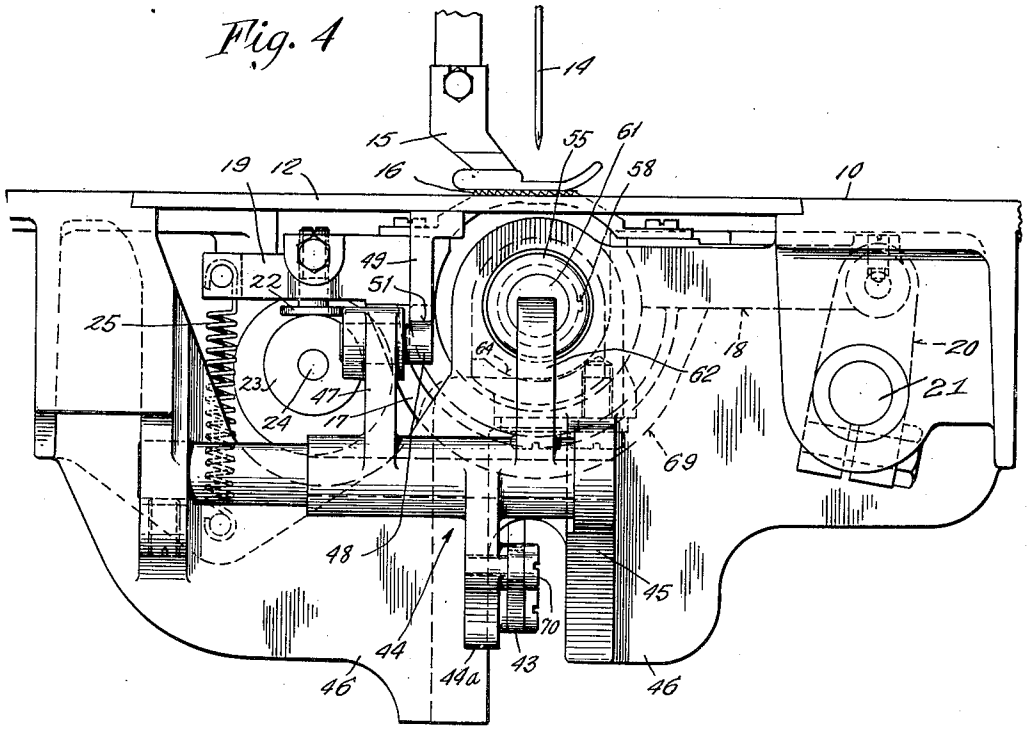
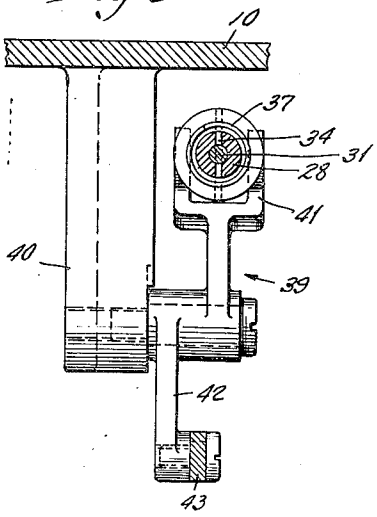


Fig. 5



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BOBBIN CASE REMOVING AND REPLACING MECHANISMS FOR SEWING MACHINES

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18 Claims. (Cl. 112—181)

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This invention relates to sewing machines, and more particularly to bobbin case removing and replacing mechanisms associated with the loop-takers of the said machines.

An object of the invention is to provide in a sewing machine an improved mechanism which facilitates the removal and replacement of the bobbin and bobbin case.

Another object of the invention is to provide a mechanism as above which is simple in construction, economical to fabricate, and which is reliable in operation over a long period of use.

In accomplishing the above object there is provided by the invention, a novel mechanism arranged to shift the bobbin and bobbin case of the machine from a point in operative relation to the hook or loop-taker to a convenient and accessible location, all without disturbing, moving, or disconnecting the said loop-taker. This is of great advantage, since the setting of the loop-taker with respect to the reciprocating needle of the machine is very critical, and there is thus avoided by the invention the problem of providing a separable coupling or clutch between the loop-taker and its actuating shaft as required by prior constructions, and which clutch must accurately position the loop-taker in its original setting each time the clutch becomes engaged.

A feature of the invention is the provision of a mechanism as above which is quick, convenient and positive in its operation thereby eliminating loss of time when changing bobbins. Such loss of time is of extreme importance in the garment manufacturing trades.

Another feature of the invention is the provision of automatic means for ejecting and returning the bobbin case and bobbin to a position for easy removal and replacement and also the provision of positive automatic locking means associated therewith for preventing inadvertent breakage of the machine needle during such automatic operation.

Yet another feature of the invention is the provision of guard or support means which minimize the likelihood of the bobbin case from falling out of desired position before its manual removal and after its replacement.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a vertical section through the bed of a sewing machine made in accordance with the invention, the section being taken along the axis of the loop-taker actuating shaft.

Fig. 2 is a fragmentary elevation of a portion of the bobbin-shifting mechanism of the invention, which portion is shown in dotted lines at the left end of Fig. 1.

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Fig. 3 is a section like Fig. 1, but showing the parts of the mechanism in shifted position, ready for removal of the bobbin and bobbin case from the machine.

Fig. 4 is an end elevation of the mechanism, looking in the direction of the arrows 4, 4 of Fig. 1.

Fig. 5 is a fragmentary view partly in elevation and partly in section, taken on the line 5—5 of Fig. 1, and

Fig. 6 is an axial section through the bobbin and bobbin case of the machine.

As shown, the sewing machine of the present invention comprises a horizontal bed 10 having a throat plate 11 and a cover slide 12, the latter being mounted in an opening 13 in the bed. The machine has stitching means comprising a needle 14, presser foot 15 and feed dogs 16, which latter are mounted on a segment-shaped feed bar 17 having extensions 18 and 19 by which it is actuated to give the said dogs the required four-directional movement. The extension 18 of the feed bar is pivotally connected with a lever 20 carried by an oscillating shaft 21, and the extension 19 mounts a follower 22 for engagement with a roller 23 carried on an eccentric shaft 24. The extension 19 of the feed bar is connected with an extension spring 25 in the usual manner to maintain the engagement between the follower 22 and roller 23.

The movement of the feed bar 17 and feed dogs 16 is synchronized with that of the needle 14 by the usual mechanism so that when the needle is in lowered position the feed dogs are also lowered, and vice versa.

The bed 10 of the machine has a depending portion 26, Figs. 1 and 3, in which is mounted a bearing sleeve 27 journaling a loop-taker actuating shaft 28, the latter adjacent the bearing 27 carrying a rotary hook or loop-taker 29. Mounted within the loop-taker 29 is a bobbin case 30. The bobbin case is hollow and supports within it a bobbin "B," see Fig. 6, which is carried on a stud "S" rigid with the case.

According to the present invention improved means are provided for enabling the bobbin case 30 and bobbin therein to be quickly and conveniently removed from its operating position adjacent and within the loop-taker 29 for replacement of the bobbin. This means operates in response to opening movement of the cover slide 12, and shifts the bobbin and the bobbin case 30 axially out of the loop-taker 29 and directly under the opening 13 of the bed uncovered by the slide so as to be readily accessible.

This is done without disturbing the loop-taker 29 from its setting on the actuating shaft 28, thus obviating the need for a precise automatic clutch

mechanism arranged to reengage only at a single, accurately adjusted rotative position. The shifted or accessible position of the bobbin case 30 is shown in Fig. 3, and the shifting mechanism is so organized that the bobbin case is securely held in the shifted position and yet is easily removable therefrom by the fingers of the operator, and is guarded against inadvertent dislodgment and dropping out.

Accordingly, referring to Figs. 1 and 3, the loop-taker actuating shaft 28 has an ejecting pin 31 carried in an axial bore thereof, said pin having a tapered end 32 adapted to be received in a recess 33 in the end wall of the bobbin-carrying stud "S" of the bobbin case 30, and engage the said wall. Preferably the recess 33 is formed by a countersink in the intersection of deep cross-slots 33a, Fig. 6, in the stud "S," the said cross-slots enabling the stud-end to be compressed during removal and application of bobbins and to spring back to a larger diameter for retaining a bobbin in place.

The other end of the ejecting pin 31 has a transverse driving pin 34 which extends through opposite longitudinal slots 35 in the shaft 28 and is anchored in a sleeve 36 slidably mounted on the said shaft.

For the purpose of yieldably holding the sleeve 36 and ejecting pin 31 in a retracted position shown in Fig. 1, a compression spring 37 is provided on the shaft 28, engaging the sleeve 36 and also engaging a collar 38 fixedly secured to the shaft 28 adjacent the bearing 27. If desired, in place of the collar 38 any well known equivalent device may be used, such as a snap ring or the like.

When the ejecting pin 31 is in the retracted position of Fig. 1, the bobbin case 30 may occupy its normal operating position within the loop-taker 29 for the purpose of sewing. The retracted position of the pin 31 is such that the end 32 thereof is spaced from the bobbin case 30 a substantial degree, as shown in Fig. 1, to enable the thread loop to be swept past the case without interference. When the ejecting pin 31 is shifted to an advanced or projecting position as shown in Fig. 3, it ejects the bobbin case 30 from the loop-taker 29 and shifts the case axially to a position directly under the opening 13 in the bed 10.

For the purpose of actuating the ejecting pin 31, a lever 39 is provided, mounted intermediate its ends on a depending portion 40 of the machine bed 10. One end 41 of the lever 39 is bifurcated and shaped for engagement with the slidable sleeve 36 so as to shift the latter along the shaft 28 from the retracted position of Fig. 1, thereby shifting the ejecting pin so as to displace the bobbin case 30 from the loop-taker 29. The other end 42 of the lever 39 is connected through a link 43 with a lever 44 which is mounted intermediate its ends on a bracket extension 45 of a depending portion 46 of the machine bed 10.

The lever 44 has an arm 47 carrying a pin 48 which is engageable with and adapted to be driven by a depending lug 49 secured to the underside of the cover slide 12. The lug 49 is provided with a slot 50 for receiving the pin 48, and has a camming or locking surface 51, also for engagement with the pin 48.

Referring to Figs. 1 and 2, when the ejecting pin 31 is in its retracted position, the arm 47 of the lever 44 is so located that the pin 48 thereof engages the locking surface 51 of the lug 49 at

the time that the cover slide 12 is closed. For this condition the lever 44, and consequently the ejecting pin 31 is locked against inadvertent shifting. Normally, for these positions of the parts a clearance exists between the bifurcated end 41 of the lever 39 and the sleeve 36 on the loop-taker actuating shaft 28, the said clearance existing on account of the cam action of the lug surface 51, and being maintained at the lever end 41 by spring means to be hereinafter described, the said spring means operating to maintain the driving pin 48 in engagement with the locking cam surface 51 of the lug 49.

When the cover slide 12 is opened, that is, shifted to the left as viewed in Fig. 3, the locking surface 51 of the lug 49, being on a slight angle, will depress the driving pin 48 and shift the lever 44 slightly clockwise. As the locking surface 51 clears the driving pin 48, the latter will be free to enter the slot 50 of the lug 49, and with continued movement of the cover slide 12 the driving pin will engage the wall 52 of the slot. The movement of the lug 49 to the left therefore will drive the lever 47 counterclockwise through an arc, and the said movement will be transmitted through the link 43 and lever 39, and through the sleeve 36 to the ejecting pin 31 so as to drive the latter to its projecting position.

For the purpose of restraining rotation of the bobbin case 30, and for gripping and holding the latter during the shifting movement thereof to accessible position, means are provided including a retainer or hanger 53 for engagement with the bobbin case and bobbin therein, the said retainer having a shank 54 carried in a plunger 55 slidably mounted in a bearing sleeve 56 in the depending portion 46 of the machine frame or bed. The shank 54 of the retainer is secured against turning in the plunger 55 by a set screw 57, and a lug "L" on the retainer is accommodated in a cut "C" in the end of the plunger to positively key the latter and retainer together. The lug "L" of the retainer is accommodated in a slot "K" of the bobbin case 30, Fig. 6, thereby to key the said case and the retainer together. Also, the plunger 55 is prevented from turning in the bearing sleeve 56 by a key 58, Fig. 4.

The plunger 55 is axially movable in the sleeve 56 between an extended or operative position shown in Fig. 1 and a retracted position shown in Fig. 3, which latter position is that occupied in holding the bobbin case 30 and bobbin carried therein in their extended positions projecting from the loop-taker 29, ready for removal.

Means are provided under the control of the lever 44 for maintaining a continual pressure on the plunger 55, which pressure tends to yieldably hold the latter in its extended or operative position, the said means comprising a sleeve or follower 59 slidably carried in an axial bore 60 in the plunger, the said follower having a head 61 for engagement with the end of an arm 62 secured to the lever 44 to move therewith. Within the follower 59 a compression spring 63 is provided, having one end engaging the end of the bore 60 in the plunger 55, the said spring thereby tending to yieldably hold the follower 59 and plunger 55 apart as shown in Fig. 3. As a result, the head 61 of the follower 59 is maintained in engagement with the lever arm 62, and also the bobbin case retainer or hanger 53 carried by the plunger 55 is maintained in engagement with the bobbin case 30. The exact position of the plunger 55 when in the extended or operative

position shown in Fig. 1 is extremely important, and it will be noted that for this position a positive contact is effected between a flange 55a of the plunger and the end of the sleeve 56, this pressure being maintainned by the compression spring 63. This positive contact insures correct relationship of the bobbin case 30 with respect to the loop-taker 29. During the shifting movement of the bobbin case the pressure maintained on it by the retainer 53 will hold the case positioned on the end 32 of the ejecting pin, and prevent the case from dropping.

When, however, the bobbin case is being supported in the shifted position shown in Fig. 3, it may be easily removed from the grip of the ejecting pin 31 and retainer 53 by moving the latter and the plunger 55 slightly to the left, compressing the spring 63. This movement of the retainer and plunger is accomplished at the time that the bobbin case 30 is grasped by the fingers for removal, by the mere act of pressing the case 30 slightly to the left so as to disengage the end 32 of the ejecting pin from the case.

During such removal of the bobbin case through the opening 13 in the bed 10, if the case should slip from the operator's grasp, it will be supported against falling to an inaccessible place by the provision of a trough 64 which extends from the portion 46 of the frame to a location under the shifted bobbin case.

Preferably the width of the trough 64 is approximately equal to the diameter of the bobbin case 30, or does not greatly exceed the said diameter, so that the fingers which grasp the case may extend downward slightly past the edges of the trough. By this arrangement the grasping of the case is facilitated, since the fingers may be properly positioned without interference, to engage the case on diametrically opposite sides. The likelihood of the case slipping from the grasp is therefore minimized.

The action of the compression spring 63 and bobbin case retainer or hanger 53 which is yieldably held by the said spring against the bobbin case is such that a desirable gripping action is had for holding the case in its shifted position, either prior to removal or after reinsertion, and this is an important advantage since it prevents inadvertent dropping of the bobbin case, and the expenditure of time which would be required in retrieving the case.

Referring to Fig. 1, when the parts of the shifting mechanism are in the normal position wherein the machine is in condition to sew, a clearance 65 exists between the head 61 of the follower 59 and the plunger 55. This clearance enables the follower 59 to be shifted slightly to the right during the initial opening movement of the cover slide 12, thereby to accommodate for the initial clockwise movement of the lever 44 effected by the camming action of the locking surface 51 of the lug 49. It should be noted that the slope of the locking surface 51 of the lug 49 provides a detent or restraining action on the slide 12 which tends to yieldably hold it in closed position.

It will be understood that during the actuation of the shifting mechanism for the bobbin case 30 the compression springs 63 and 37 are in opposition. During the initial or starting movement of the cover slide 12 the levers 44 and 39 will be shifted slightly in a clockwise direction. This will increase slightly the clearance between the bifurcated end 41 of the lever

39 and the cooperable sleeve 36, and also take up the clearance 65 between the head 61 of the follower 59 and the plunger 55. No movement of the ejecting pin 31 will occur during this initial movement of the cover slide 12.

When the slide 12 is moved further, as the locking surface 51 clears the driving pin 48, the latter will be engaged by the surface 52 of the slot 50 in the lug 49. Further movement of the cover slide 12 will then drive the levers 44 and 39 and cause shifting of the plunger 55 and ejecting pin 31 to the left, these parts carrying between them the bobbin case 30. The follower 59 engaged by the lever arm 62 will move more rapidly than the ejecting pin 31 because the levers 44 and 39 are so proportioned. However, due to the provision of the compression spring 63, the plunger 55 and bobbin case hanger 53 will be maintained against the bobbin case 30 and will move at the same rate as the latter and as the ejecting pin 31. During this movement the compression spring 63 will be continually expanding, and will reach its maximum expansion when the parts have completed their shifting movement and are in the position shown in Fig. 3, this position being determined by engagement of the lower end 44a of the lever 44 with the wall 46a of the portion 46 of the machine frame. For this position, also, the compression spring 37 will have reached its maximum compression, and the said spring will continually apply pressure to the lever 39 and link 43 and therefore to the lever 44, tending to hold the pin 48 thereof in engagement with the wall 52 of the lug 49. This pressure of the spring 37 will be offset to some extent by the pressure of the compression spring 63 which is exerted by the head 61 of the follower on the lever arm 62. The spring 37 when compressed exerts a greater pressure than the spring 63 when the latter is in extended position, but the resultant pressure is not sufficient to overcome friction of the linkage and lever parts, and of the cover slide 12 so as to inadvertently shift the latter closed. However, the closing movement of the cover slide is facilitated by the said resultant pressure of the springs, so that the slide closes easily, especially during the initial closing movement.

For the purpose of automatically locking the shifting mechanism when the needle 14 is in lowered position and passing through the throat plate 11, to thereby prevent breakage of the needle, the link bar 43 has a lateral extension 66 having ears 67 and 68 for engagement with a flange 69 on the lower portion of the feed bar 17. Thus, referring to Fig. 1, if the needle 14 is in its lowered position the said bar 17 will be lowered and the flange 69 thereof will engage and obstruct the ear 68 of the link 43, and prevent shifting of the latter and consequent opening of the cover slide 12 and shifting of the mechanism. Only when the feed bar 17 is in raised position, corresponding with the raised position of the needle 14, may the cover slide 12 be opened and the shifting mechanism actuated for shifting the bobbin case 30.

Referring to Fig. 3, if the mechanism is in shifted position with the cover slide 12 open, and if the needle 14 should inadvertently be lowered, the resultant lowering of the feed bar 17 will cause the flange 69 thereof to engage and obstruct the ear 67 of the link 43. The mechanism is thus again locked, this time in the open position, and cannot be shifted and result in the breakage of the needle 14. However,

upon the needle 14 and feed bar 17 being raised, the ears 67 and 68 of the link bar 43 will again clear the flange 69 of the feed bar and enable the mechanism to be shifted by closing the cover slide 12.

If it should be desired to open the cover slide 12 without shifting the bobbin case 30, this may be accomplished by removing the pivot screw 70 from the lever 44 so as to disconnect the latter from the link bar 43. Also, a dog-point set screw 71 is provided in the portion 46 of the frame, which when tightened, bears against the plunger 55 and prevents the latter from shifting axially. Normally the set screw 71 is tightened against a movable flat link 72 which extends under the head of the screw 71 and prevents the point of the screw from engaging and locking the plunger 55.

There is thus provided by the present invention a simple and reliable mechanism for automatically shifting the bobbin of a sewing machine to a position of easy access in response to opening of the cover slide on the machine bed, all without disturbing or moving the loop-taker 29. After the bobbin case has been so shifted, it is easily removable for the replacement of the bobbin, and reinsertable, and these operations may be quickly performed without loss of time. Should the bobbin case slip from the grasp while being removed, the trough 64 will prevent its dropping to an inaccessible place which would delay its recovery. Positive, automatically operative means are also provided for preventing actuation of the shifting mechanism when the needle of the machine is in lowered position, thereby preventing breakage of the needle and further loss of time.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. A sewing machine having a bed formed with an opening; a movable cover plate for the said opening; a loop-taker; a bobbin case adjacent the said loop-taker; means mounting said bobbin case for horizontal straight line movement; and means operatively connecting the cover plate and said last-named means to shift the bobbin case to a position of convenient access under said opening in response to movement of the cover from over said opening.

2. A sewing machine having a bed formed with an opening; a movable cover plate for the said opening; a loop-taker; a bobbin case adjacent the said loop-taker; rotation-restraining means engaging the said bobbin case; and means for axially shifting the bobbin case in a straight line, said means being operatively connected to the cover plate and operative upon movement of the cover plate from over said opening, to simultaneously shift the bobbin case from the loop-taker to a position of convenient access under the opening and move the rotation restraining means therewith.

3. A sewing machine having, in combination a bed formed with an opening; a movable cover plate for the said opening; a reciprocating needle; a loop-taker; a bobbin case adjacent the said loop-taker; means under control of the said cover plate for axially shifting the said bobbin case from the loop-taker to a position of convenient access; and a mechanism locking against movement the said means for shifting the bobbin case when the needle is in lowered position.

4. A sewing machine having a bed formed with an opening; a movable cover plate for the said

opening; a loop-taker; a bobbin case adjacent the said loop-taker; and means under control of the said cover plate and including a pair of gripping members movable into engagement with the front and rear face of the bobbin case for shifting the latter from the loop-taker to a position of convenient access.

5. A sewing machine having a bed formed with an opening; a loop-taker; a bobbin case adjacent the said loop-taker; and means including a manually operable member movably mounted on the machine bed and including a pair of gripping members engageable with the front and rear face of the bobbin case and operable by the said member for shifting the bobbin case from the loop-taker to a position of convenient access under the said opening.

6. A sewing machine having a bed formed with an opening; a loop-taker; a bobbin case adjacent the said loop-taker; and means including a manually operable member movably mounted on the bed, and including a pair of gripping members engageable with the bobbin case and operable by the said manually operable member for shifting the bobbin case from the loop-taker to a position of convenient access, the said gripping members being coaxial with the bobbin case, one of the said members having a positive driving connection with the manually operable member, and the other gripping member being spring-connected to the manually operable member.

7. A sewing machine having a bed formed with an opening; a movable cover plate for the said opening; a loop-taker; a bobbin case adjacent the said loop-taker; means under control of the said cover plate and including a pair of gripping members movable into engagement with the front and rear faces of the bobbin case for shifting the latter from the loop-taker to a position of convenient access; and a rest located to extend under the bobbin case when the latter is in shifted position, for supporting the said case in circumstances where it is moved downward while between the gripping members.

8. A sewing machine having a bed formed with an opening; a loop-taker; a bobbin case adjacent the said loop-taker; a retainer mounted on the bed and movable between retracted and extended positions, the said retainer engaging and holding the bobbin case against turning and in operative position adjacent the loop-taker; and longitudinally movable means for axially shifting with a straight line movement the said bobbin case from the loop-taker to a position of convenient access, the said retainer moving with the bobbin case when the latter is shifted away from the loop-taker by said means.

9. A sewing machine having, in combination, a bed formed with an opening; a movable cover plate for the said opening; a reciprocating needle; feed dogs; a feed bar carrying the feed dogs, the said bar being coordinated with the needle, a loop-taker; an actuating shaft for the loop-taker; a bobbin case adjacent the said loop-taker; means under control of the said cover plate, including an ejecting pin axially slidable in the said actuating shaft and engaging the bobbin case, and including a linkage between the ejecting pin and the cover plate for shifting the latter from the loop-taker to a position of convenient access; and a mechanism for locking against movement the said means for shifting the bobbin case when the feed bar is in a predetermined position corresponding to lowered position of the needle, the said mechanism includ-

ing lugs on the linkage, and including a projection on the feed bar, engageable with the said lugs.

10. A sewing machine having, in combination, a bed formed with an opening; a movable cover plate for the said opening; a reciprocating needle; feed dogs; a feed bar carrying the feed dogs, the said bar being coordinated with the needle; a loop-taker; a bobbin case adjacent the said loop-taker; means under control of the said cover plate for shifting the said bobbin case from the loop-taker to a position of convenient access; and a mechanism locking against movement the said means for shifting the bobbin case when the feed bar is in a predetermined position corresponding to lowered position of the needle.

11. A sewing machine having a bed formed with an opening; a movable cover plate for the said opening; a loop-taker; an actuating shaft for the loop-taker; a bobbin case adjacent the said loop-taker; and means under control of the said cover plate, including an ejecting pin axially slidable in the said actuating shaft and engaging the bobbin case, and including a retainer movably mounted on the bed and engaging the bobbin case opposite to the point of engagement of the ejecting pin for shifting the case from the loop-taker to a position of convenient access.

12. A sewing machine having a bed formed with an opening; a movable cover plate for the said opening; a loop-taker; an actuating shaft for the loop-taker; a bobbin case adjacent the said loop-taker; and means under control of the said cover plate, including an ejecting pin axially slidable in the said actuating shaft and engaging the bobbin case, and including a retainer movably mounted on the bed and normally engaging the bobbin case opposite to the point of engagement of the ejecting pin, for shifting the case from the loop-taker to a position of convenient access, the said retainer being keyed against turning and having means cooperable with the bobbin case for locking the latter against turning during sewing operations of the machine.

13. A sewing machine having, in combination, a bed formed with an opening; a movable cover plate for the said opening, having a depending lug rigid therewith; a lever mounted under the bed and engaging the said depending lug for operation thereby; a loop-taker; an actuating shaft for the loop-taker; a bobbin case adjacent the said loop-taker; an ejecting pin passing axially through the actuating shaft and engageable with the bobbin case; a second lever mounted under the bed, for operating the said ejecting pin; and a link bar connecting the said levers for simultaneous operation, the said cover plate when moved to uncover the opening, actuating the ejecting pin and shifting the bobbin case to a position of convenient access under the said opening.

14. A sewing machine having, in combination, a reciprocating needle; a bed formed with an opening; a movable cover plate for the said opening, having a depending lug rigid therewith; a lever mounted under the bed and engaging the said depending lug for operation thereby; a loop-taker; an actuating shaft for the loop-taker; a bobbin case adjacent the said loop-taker; an ejecting pin passing axially through the actuating shaft and engageable with the bobbin case; a second lever mounted under the bed, for operating the said ejecting pin; a link bar connecting the said levers for simultaneous operation, the said cover plate when moved to uncover the opening, actuating the ejecting pin and shifting the bobbin case to a position of convenient access under the said opening; and a mechanism for locking against movement the said link bar when the needle is in lowered position.

15. A sewing machine having a bed formed with an opening; a movable cover plate for the said opening; a loop-taker; a bobbin case adjacent the said loop-taker; means under control of the said cover plate and including a pair of gripping members engageable with the bobbin case for shifting the latter from the loop-taker to a position of convenient access; and a rest located to extend under the bobbin case when the latter is in shifted position, for supporting the said case in circumstances where it is moved downward while between the gripping members, and the said rest being sufficiently narrow to enable an operator's fingers when grasping the said case to extend past the edges of the rest.

16. A sewing machine having a bed formed with an opening; a movable cover plate for the said opening; a loop-taker; an actuating shaft for the loop-taker; a bobbin case adjacent the said loop-taker; and means under control of the said cover plate and including an ejecting pin axially slidable in the said actuating shaft and engaging the bobbin case for shifting the latter from the loop-taker to a position of convenient access.

17. A sewing machine having a bed formed with an opening; a movable cover plate for the said opening; a loop-taker; a bobbin case adjacent the said loop-taker; and means under control of the said cover plate for gripping and shifting the said bobbin case from the loop-taker to a position of convenient access, the said means including a retainer member movably mounted under the said bed and engageable with the bobbin case, and spring means applying a reduced pressure to said retainer when the cover plate is opened to reduce the gripping pressure of the retainer and facilitate removal of the bobbin case.

18. A sewing machine having a bed formed with an opening; a movable cover plate for the said opening; a loop-taker; a bobbin case adjacent the said loop-taker; and means under control of the said cover plate for gripping and shifting the said bobbin case from the loop-taker to a position of convenient access, the said means including a retainer member movably mounted under the said bed and engageable with the bobbin case, a follower member connected with the cover plate, and means connected to said retainer and applying a reduced pressure to said retainer when the cover plate is opened to reduce the gripping pressure of the retainer and facilitate removal of the bobbin case.

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