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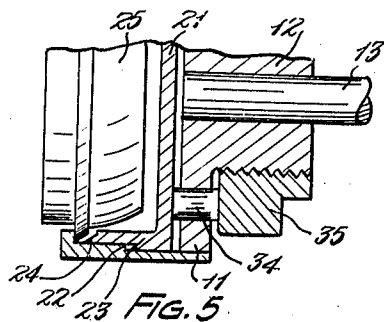
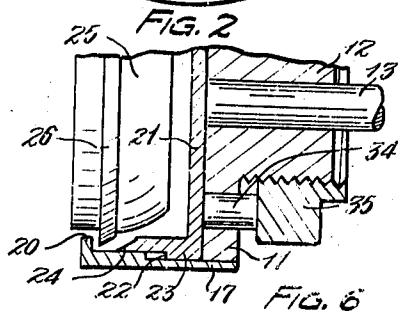
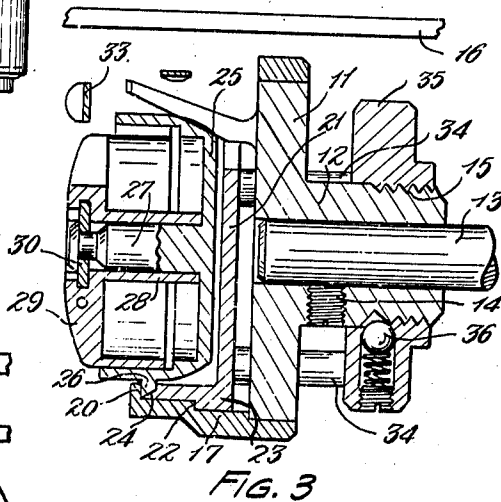
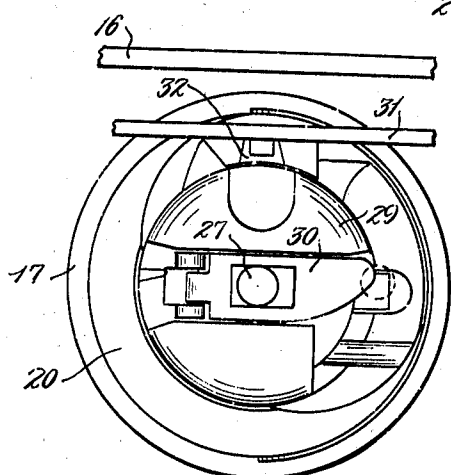
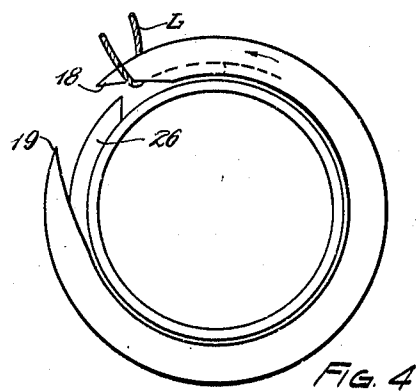
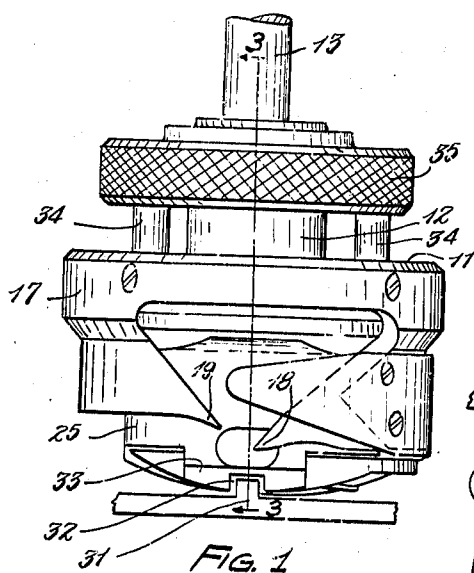
C. E. COLEGROVE

2,332,964

ROTARY LOOP TAKER FOR SEWING MACHINES

Filed May 15, 1941

2 Sheets-Sheet 1



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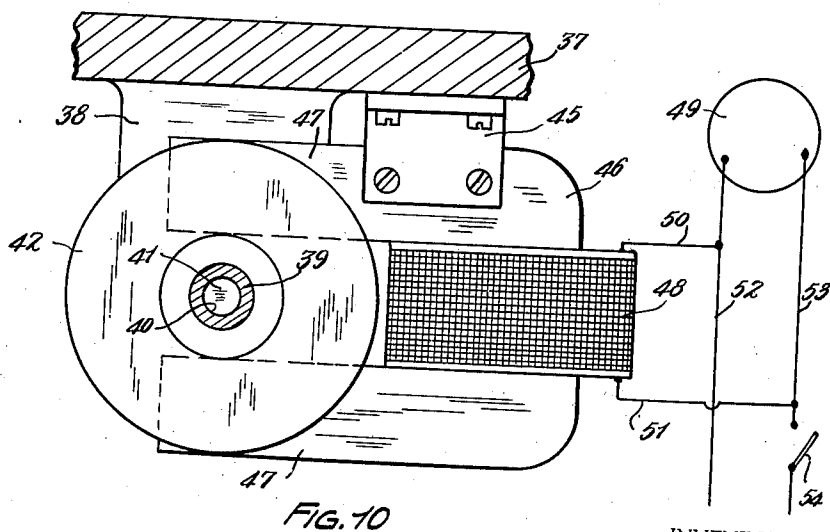
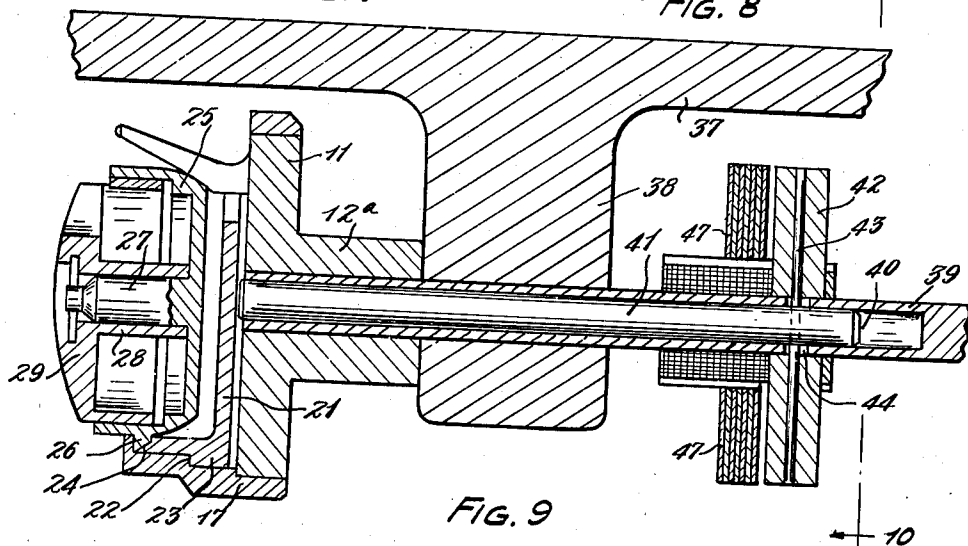
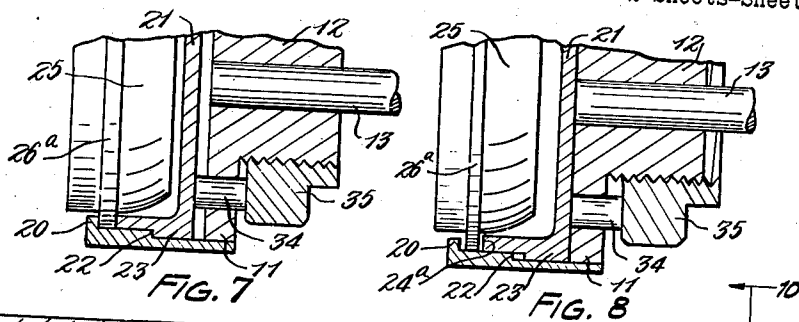
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2 Sheets-Sheet 2



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2,332,964

ROTARY LOOP TAKER FOR SEWING MACHINES

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Application May 15, 1941, Serial No. 393,572

28 Claims. (Cl. 112—228)

This invention relates to a loop taker for a sewing machine as, for example, a "lock stitch" sewing machine. The invention relates more particularly to a loop taker of the type known as a rotary loop taker or revolving hook loop taker.

As is well known in the art, loop takers of the rotary or revolving hook type include a rotatable cup-shaped body which has a loop seizing beak for manipulating the loop in the upper or needle thread. A bobbin case carrier is mounted within the cup-shaped body but held against rotation therewith or therein and receives the bobbin which carries the thread. In this connection it will be understood that suitable means usually carried by the bed plate of the sewing machine cooperates with a portion of the bobbin case carrier to hold the latter against rotation while the body rotates relative thereto. The bobbin is mounted in a bobbin case supported in the bobbin case carrier against rotation relative thereto. The loop seizing beak of the rotatable body enters the loop in the upper or needle thread and carries one side of said loop in front of the rim of the body while taking the other side of said loop to the rear of the bobbin case carrier.

The rotatable body is provided with a circular raceway for a peripheral bearing rib on the non-rotatable bobbin case carrier. The body usually has a portion cut away to form the loop seizing beak and to provide also an opening for the upper or needle loop thread to permit the passage of that side of the loop which is carried to the rear side of the bobbin case carrier. The bobbin case carrier has a portion of its periphery cut away to provide a similar opening, wherefore the raceway in the body and the bearing rib on the bobbin case carrier are not continuous throughout their circumferences.

In other words, the construction provides gaps in the cooperating bearing surfaces of the rib and raceway and these gaps can cause what is known in the art as "clogging." This "clogging" may cause serious difficulty in the efficient operation of a sewing machine of this type and can result even in temporarily stopping the operation of the machine.

"Clogging" will not occur if the upper or needle thread loop is properly or normally formed and the loop seizing beak carries such loop in the correct manner around the bobbin case and bobbin case carrier. On the other hand, should the upper or needle thread loop be improperly formed as, for example, if it should be too slack or if loose threads should accumulate in the vicinity of the loop taker, such improperly formed loop

or loose threads may be picked up by the loop seizing beak or hook and be drawn between the raceway in the body and the peripheral bearing rib on the bobbin case carrier. Under such circumstances it frequently happens that the thread which is improperly drawn into the raceway becomes so tightly wedged therein as to prevent the free and efficient operation of the loop taker or even to completely stop its operation. When such an occurrence takes place it is necessary usually to take the loop taker apart so that the wedged thread can be removed from the raceway. This is a serious disadvantage as taking the loop taker apart is a fairly complicated manipulation which the usual operator is not competent to perform, particularly as such operator ordinarily is not equipped with the proper tools for this purpose.

An object of the invention is to provide a construction for a sewing machine loop taker of the type specified and which is so designed that the loop taker can be maintained in proper working condition readily and conveniently by any operator.

Another object of the invention is to provide a loop taker such as specified in the last named object and wherein the proper maintenance of the same can be obtained without disassembling the loop taker mechanism.

A still further object is to provide a loop taker mechanism which is so constructed that should any thread become wedged between the raceway in the rotatable body and the bearing rib on the bobbin case carrier such thread can be readily and quickly removed by the operator without disassembling the loop taker mechanism.

Another object of the invention is to provide in connection with a loop taker mechanism, a power operated arrangement enabling the loop taker to be maintained readily and easily in proper operating condition and free of "clogging."

Further and additional objects and advantages not hereinbefore specified will subsequently become apparent during the detailed description which is to follow of several embodiments of the invention.

The present invention contemplates attaining the objects above specified and the objects and advantages later to become apparent by providing in the loop taker means for enlarging or expanding in a transverse direction the raceway in the rotatable body and thus providing substantial clearance between the raceway and the peripheral rib on the bobbin case carrier, wherefore when the loop taker is rotated any thread which

has entered the raceway can then escape therefrom and pass into the interrupted or cutaway portion of the bearing surface on the bobbin case carrier. When such thread has been eliminated from the raceway the latter can be restored to its normal transverse dimension providing a running fit for the peripheral rib on the bobbin case carrier.

In varying the transverse dimension of the raceway simple and convenient means is provided which may be manually or power operated and which does not require any disassembling of the loop taker or the use of tools.

Referring to the accompanying drawings illustrating several embodiments of the invention,

Fig. 1 is a top plan view of a rotary loop taker and a portion of the horizontal operating shaft for the same and illustrates a portion of the keeper which is carried by the bed plate of the sewing machine and engages a cooperating portion of the bobbin case carrier to hold the latter and the bobbin case against rotation.

Fig. 2 is a front end elevational view of the loop taker shown in Fig. 1.

Fig. 3 is a longitudinal sectional view through the loop taker shown in Fig. 1 and is taken substantially on line 3—3 of Fig. 1 looking in the direction of the arrows.

Fig. 4 is a somewhat diagrammatic view illustrating the upper or needle thread loop which has been picked up by the loop seizing beak of the loop taker, which operation if improperly performed may result in what is known as "clogging."

Figs. 5 and 6 are fragmentary longitudinal sectional views through the loop taker similar to Fig. 3 but on a smaller scale and showing certain of the parts in different relationships than the relationship in which said parts are shown in Fig. 3.

Figs. 7 and 8 are fragmentary longitudinal sectional views through a loop taker differing in construction from that shown in the previously referred to views, in that the peripheral rib on the bobbin case carrier and the raceway of the rotatable body are of different configuration from the previously illustrated form; it being noted that in Fig. 7 the parts are positioned so that the raceway is of normal transverse dimension while in Fig. 8 said parts are positioned so that the raceway is enlarged or expanded.

Fig. 9 is a longitudinal sectional view through a modified embodiment of the invention which is power operated, and

Fig. 10 is an end view, partly in elevation and partly in section, taken approximately along line 10—10 of Fig. 9 looking in the direction of the arrows, and, in addition, shows diagrammatically the manner in which the field winding of the magnet may be in the circuit for the main operating motor of the sewing machine.

The loop taker shown in Figs. 1 to 6 inclusive comprises a body which includes the disk 11 having a centrally disposed hub or sleeve portion 12 fixedly mounted upon the horizontally extending shaft 13. The shaft 13 is rotatably supported in suitable bearings and is connected with and suitably driven by the operating mechanism of the sewing machine as will be well understood. The sleeve or hub portion 12 is fixed to the shaft 13 by means of one or more set screws 14 or by some other suitable securing means. The outer end of the hub 12 is externally threaded, as indicated at 15, for a purpose later to be described.

It will be seen that the disk 11 rotates on

a horizontal axis which is located below and extends parallel to the needle plate 16 of the sewing machine and is positioned in proper relation to the needle, feed means and other functional parts of the stitch forming mechanism as will be well understood.

The body of the loop taker also includes the hook ring 17 which, in this instance, is shown as separate from the disk 11 but fitting the periphery of the latter and secured thereto by suitable means such as screws.

It will be understood that the hook ring 17 of the body is cut away as is usual in loop takers to provide the loop seizing beak 18 and the loop controlling tail 19. The hook ring 17 is provided at its outer end and remote from the disk 11 with an arcuate inwardly and radially extending flange 20 that forms the outer side of a raceway in the body and in which is journaled the peripheral bearing rib on the bobbin case carrier later to be referred to.

The body further includes a cup-shaped member 21 which is mounted within the hook ring 17 and has its outer or open end located so as to form the other or inner face of the raceway for the bearing rib of the bobbin case carrier. The member 21 is capable of limited longitudinal or axial movement in the ring 17, the limits of such movement being defined by the distance between the disk 11 and an internal shoulder 22 formed in the hook ring 17. The cup-shaped member 21 at its inner or bottom end is provided with an external annular rib 23 extending into the space between the disk 11 and the internal shoulder 22 and limiting the longitudinal displacement or movement of the member 21 in opposite directions. The outer or open end of the member 21 is beveled, as indicated at 24 in Figs. 3, 5 and 6.

It will be noted that in Fig. 3 the rib 23 of the member 21 is in engagement with the internal shoulder 22 and when such relationship exists the raceway in the body for the peripheral rib of the bobbin case carrier has its normal working transverse dimension. If the cup-shaped member is displaced longitudinally toward the disk 11 to move the rib 23 away from the shoulder 22, as indicated in Fig. 5, the transverse dimension of the raceway is enlarged. If such longitudinal movement of the member 21 is continued until said member contacts the disk 11, as indicated in Fig. 6, then the transverse dimension of the raceway is enlarged to the maximum extent.

The bobbin case carrier is indicated at 25 and is substantially cup-shaped and fits within the body as will be well understood. The bobbin case carrier is provided with the peripheral annular rib 26 extending into the raceway formed by the ring 17, its flange 20 and the outer or open end of the cup-shaped member 21. The peripheral rib 26 is tapered complementary to the taper of the outer or open end of the member 21 in the forms shown in Figs. 1 to 6 inclusive.

It will be seen that when relative rotation takes place between the body and the bobbin case carrier 25, during the rotation of the body, said rib 26 and the raceway will have relative rotation, it being understood there is a running working fit between the rib and raceway. The bobbin case carrier is provided with an outwardly extending centrally disposed post 27 which slidably receives the centrally disposed sleeve 28 of the bobbin case 29, as is well known in the art. Also, as will be apparent to one skilled in

the art, suitable fastening means, indicated at 30, is provided on the bobbin case for securing the same in position upon the post 27 of the bobbin case carrier.

It will be understood that the bobbin on which the thread is wound is mounted on the sleeve 28 of the bobbin case and is housed within said case and the bobbin case carrier when these two latter parts are in assembled relationship.

The bobbin case carrier 25, bobbin case 29 and the bobbin are held against rotation with the body by means of a keeper 31 carried by the bed plate of the sewing machine and engaging in a notch 32 formed in an upstanding portion 33 at the outer end of the bobbin case carrier 25, as is usual in loop takers of this type.

In order to effect the expansion and contraction of the raceway the following arrangement is employed. The disk 11 of the body is provided with a plurality of circumferentially spaced openings preferably arranged concentrically to the axis of the disk while a plurality of pins 34 are slidable in these openings with their left hand ends, as viewed in the drawings, contacting the bottom of the cup-shaped member 21. The right hand ends of the pins 34 are engaged by a nut 35 screwed on the threaded portion 15 of the hub 12. A spring pressed ball detent 36 is carried by the nut 35 and retains the latter in adjusted position upon the hub 12.

When the nut 35 is screwed to its most left hand position, as viewed in Fig. 3, it pushes the pins 34 against the cup-shaped member 21 and moves the latter toward the left, as viewed in the drawings, until the rib 23 on said member engages the internal shoulder 22 of the ring 17. At this time the tapered outer or open end of the member 21 is positioned against the peripheral rib 26 of the bobbin case carrier with a working or bearing fit and the raceway defined by the flange 20 and the inclined open end of the member 21 has its normal working transverse dimension. When this condition exists the rib 26 and the raceway can rotate relative to each other with a working fit such that the bobbin case carrier does not have lateral movement relative to the body when the said body is rotating.

In the event of "clogging" i. e., threads working into the raceway, the operator merely backs off the nut 35 to relieve the pressure on the pins 34 and the cup-shaped member 21, with the result that said member is free to move toward the right as viewed in the drawings to enlarge or expand the transverse dimension of the raceway until it contacts the disk 11, at which time the raceway will have a maximum expanded transverse dimension as shown in Fig. 6. In Fig. 5 the cup-shaped member is shown as displaced only part way toward the right.

It will be understood that when the nut 35 is thus backed off and the loop taker is rotated any threads which cause the "clogging" can escape from the enlarged or expanded raceway. When the raceway has been freed of such threads the nut 35 can again be screwed to its most left hand position and the parts restored to normal operating condition.

It will have been seen that in order to free the raceway of the "clogging" threads the operator merely performs the simple operation of backing off the nut 35 and that such operation does not require any tools or any particular aptitude on the part of the operator.

It should also be observed that the amplitude

of movement of the member 21 in order to enlarge the transverse dimension of the raceway is sufficient to allow any "clogging" threads to escape from the raceway but is not so great as to render the mechanism inoperative. Consequently should the operator forget to screw the nut 35 back to its most left hand position after it has been backed off, the loop taker is still operative although perhaps its operation would be noisy.

It will be noted that the outer or open end of the member 21 is inclined or tapered and that the peripheral rib 26 on the bobbin case carrier is complementary, and this arrangement is employed since it facilitates the disengagement of clogging threads from the raceway as when the member 21 is backed off, the peripheral rib 26 can be positioned out of contact with any wall portion of the raceway.

In Figs. 7 and 8 the loop taker shown therein is identical in construction with the loop taker previously referred to except for the transverse configuration of the raceway in the body and of the peripheral rib on the bobbin case carrier. Consequently the same reference numerals are employed on these two figures as in the previous figures to indicate the corresponding parts. The outer or open end 24a of the member 21, as shown in Figs. 7 and 8, instead of being inclined is straight, while the peripheral rib 26a of the bobbin case carrier is rectangular in cross section. It will be noted that Fig. 7 shows the adjusting nut screwed to its most left hand position and the member 21 held in its most left hand position to provide the normal working transverse dimension for the raceway. In Fig. 8 the nut 35 has been backed off to expand or enlarge the transverse dimension of the raceway when it is desired to free the same of "clogging" threads.

In place of utilizing manually operated means for expanding or contracting the raceway in the body, power operated means may be employed for this purpose. An example of one form of such power operated means is shown in Figs. 9 and 10 by way of illustration and will now be described, it being understood, however, that the arrangement for expanding or contracting the raceway in the body of the loop taker by power may take various other forms.

The body, bobbin case carrier and bobbin case shown in Fig. 9 are in general identical with the corresponding parts of the loop taker shown in Figs. 1 to 6 inclusive and accordingly the same reference characters are utilized as far as possible to designate these parts.

A portion of the sewing machine bed plate is indicated in section at 37 in Figs. 9 and 10 and a support 38 projects downwardly from the underside of the bed plate and forms a front bearing for the horizontal drive shaft later to be referred to that is connected to the loop taker. The disk 11 of the body of the loop taker is provided with a hub portion 12a that is secured to the left hand end of the horizontal drive shaft 39. This drive shaft 39 is rotatably supported in a suitable bearing formed in the support 38 and in other suitable bearings not shown. The shaft 39 is connected with and driven by the operating mechanism of the sewing machine, which mechanism, in turn, may be driven by an electric motor 49, indicated diagrammatically in Fig. 10. The operating mechanism, the connection between it and the shaft 39 and the motor 49 and the other elements of the sewing ma-

chine have not been shown as they are well known in the art.

The shaft 39 is provided with a bore 40 extending inwardly of the shaft from the left hand end thereof, as clearly shown in Fig. 9, while a push rod 41 is slidably mounted in said bore and contacts at its left hand end the cup-shaped member 21 of the loop taker. An armature 42, shown by way of illustration as a circular disk, is mounted on the shaft 39 to rotate with said shaft but have limited axial movement relative to said shaft by means of a pin 43 carried by the armature 42 and passing through diametrically opposed longitudinally extending slots 44 formed in the shaft 39. The pin 43 also passes through and fits an opening in the push rod 41 and it will be seen that when the armature 42 moves endwise relative to the shaft 39 the push rod 41 will correspondingly move relative to said shaft and in the bore 40.

An electromagnet is secured to the underside of the bed plate 37 by means of a bracket 45 which is attached to the pole piece 46 of the electromagnet. The pole piece 46 is shown in this instance as being substantially U-shaped with its legs 47 extending horizontally above and below the shaft 39 and beyond the same as clearly shown in Fig. 10. The pole piece 46 of the electromagnet carries the usual field winding 48 which may be connected with any suitable source of electrical energy. Preferably the field winding 48 of the electromagnet is connected by the leads 50 and 51 to conduits 52 and 53 forming the electric circuit for the driving motor 49 of the sewing machine previously referred to, in such manner that the electromagnet is energized and deenergized simultaneously with the closing and opening of the main control switch 54 for said driving motor. That is to say, the electromagnet would be energized when the sewing machine is operating, and deenergized instantly that the operation of the machine ceases.

It will be seen that when the electromagnet is energized the armature 42 is attracted by the legs 47 of the pole piece 46 and hence is displaced relative to the shaft 39 toward the left with a resultant displacement toward the left of the push rod 41. This displacement of the armature 42 and push rod 41 toward the left moves the member 21 toward the left until the rib 23 thereof contacts the internal shoulder 22 of the ring 17. At this time the outer or open end 24 of the member 21 has a running fit with the peripheral rib 26 of the bobbin case carrier 25. That is to say, the raceway in the body of the loop taker for the rib 26 has its normal working transverse dimension.

It would be well to point out at this time that the parts are so sized that the limits of the displacement movement toward the left as determined by the engagement of the rib 23 with the shoulder 22 never brings the armature 42 into contact with the legs 47 of the pole piece 46, and consequently no rubbing action between the armature and the legs of the pole piece ever takes place.

When the electromagnet is deenergized the thrust on the push rod 41 terminates, and hence the member 21 is free to be displaced toward the right, as viewed in the drawings, to enlarge or expand the transverse dimension of the raceway in the body for the peripheral rib 26 and allow the escape of any threads which may have got-

ten into said raceway and caused clogging of the same.

In Fig. 4 there is diagrammatically illustrated the manner in which the loop seizing beak 18, of the loop taker picks up the loop L of the upper or needle thread. If the loop L is correctly formed the loop taker will carry the loop properly around the bobbin case. On the other hand, if a slack loop is formed through improper manipulation, or if loose threads accumulate in the vicinity of the loop taker, such slack loop or loose threads are liable to be picked up by the loop seizing beak 18 and be drawn between the raceway and the bearing rib 26 on the bobbin case carrier 25, resulting in "clogging."

A rotary loop taker embodying the present invention enables the slack loop, loose threads, or other obstruction causing the "clogging" to be readily cleared from the raceway.

The clearing of the raceway does not require the disassembling of the loop taker, any particular skill or knowledge on the part of the operator, or the use of tools for such purpose.

It should be understood that the present invention is not to be limited to the specific embodiment thereof illustrated herein merely as examples, but that the invention is susceptible of all variations and adaptations within the scope of the appended claims.

Having thus described my invention, I claim:

1. A rotary loop taker for a sewing machine comprising a relatively rotatable cup-shaped body and bobbin case carrier therein, said body and carrier being provided with a cooperating raceway and bearing rib, and means operatively associated with said body remotely from the open end thereof and extending into the hollow interior of the body for positively adjusting the width of said raceway.

2. A rotary loop taker for a sewing machine comprising a relatively rotatable cup-shaped body and bobbin case carrier therein, said body and carrier having a cooperating raceway and bearing rib, and positive means operatively associated with said body for maintaining the normal working width of said raceway or for enabling the width thereof to be enlarged and including a part located within the hollow interior of said body.

3. A rotary loop taker for a sewing machine comprising a relatively rotatable cup-shaped body and bobbin case carrier therein, said body and carrier having a cooperating raceway and bearing rib, and means for positively maintaining the normal working width of said raceway or for enabling the width thereof to be enlarged and including a movable part extending into the hollow interior of said body and a movable element operatively associated with said body and part, and having a portion defining a side wall of said raceway.

4. A rotary loop taker for a sewing machine comprising a relatively rotatable cup-shaped body and bobbin case carrier therein, said body and carrier having a cooperating raceway and bearing rib; and means for maintaining the normal working width of said raceway or for enabling the width thereof to be enlarged and including a movable element operatively associated with said body and having a portion defining a side wall of said raceway, and means for positively moving said element and operable from the exterior of said body and including a movable part extending into the hollow interior of said body.

5. A rotary loop taker for a sewing machine comprising a relatively rotatable cup-shaped body and bobbin case carrier therein, said body and carrier having a cooperating raceway and bearing rib, a movable element operatively associated with said body and having a portion defining a side wall of said raceway; and means for positively moving said element to vary the width of said raceway and including a slidable member engaging said element, and means for actuating said member.

6. A rotary loop taker for a sewing machine comprising a relatively rotatable cup-shaped body and bobbin case carrier therein, said body and carrier having a cooperating raceway and bearing rib, a movable element operatively associated with said body and having a portion defining the inner side wall of said raceway, a movable member supported by said body and engaging said element to move the latter to vary the width of said raceway, and means for moving said member.

7. A rotary loop taker for a sewing machine comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, a slidable element operatively associated with said body and having a portion defining a side wall of said raceway, a movable member supported by said body and engaging said element, and means operatively associated with said body for positively moving said member to move said element and vary the width of said raceway.

8. A rotary loop taker for a sewing machine comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, a movable element operatively associated with said body and having a portion defining a side wall of said raceway, a slidable member supported by said body and engaging said element, and manually operated means operatively associated with said body for positively moving said member to move said element to vary the width of said raceway.

9. A rotary loop taker for a sewing machine comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, a movable element operatively associated with said body and having a portion defining a side wall of said raceway, a movable member supported by said body and engageable with said element, and adjustable means acting on said member to move the latter positively and, in turn, move said element to vary the width of said raceway.

10. A rotary loop taker for a sewing machine comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, a movable element operatively associated with said body and having a portion defining a side wall of said raceway, a movable member supported by said body and engageable with said element, and means for moving said member to move said element to vary the width of said raceway and including a threaded portion on said body and a nut cooperating therewith and engageable with said member.

11. A rotary loop taker for a sewing machine comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, a movable element operatively associated with said body and having a portion defining a side wall of said raceway, a movable member operatively asso-

ciated with said body and engageable with said element, and power-operated means for moving said member to move said element to vary the width of said raceway.

12. A rotary loop taker for a sewing machine comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, a movable element operatively associated with said body and having a portion defining a side wall of said raceway, a movable member operatively associated with said body and engageable with said element, and electrically actuated means for moving said member to move said element and vary the width of said raceway.

13. A rotary loop taker for a sewing machine comprising a rotatable body and a bobbin case carrier mounted in said body and provided with a circumferentially extending bearing rib, a movable element mounted in said body, said body and said element having cooperating portions forming the side walls of a raceway for said rib, a movable member supported in said body and engaging said element, and means operatively associated with said body for positively moving said member to move said element and vary the width of said raceway.

14. A rotary loop taker for a sewing machine comprising a rotatable body, a bobbin case carrier mounted therein and provided with a circumferentially extending bearing rib, a movable element housed in said body, said body and said element having cooperating portions forming the side walls of a raceway for said rib, a slidable pin supported by said body and engaging with said element, and means for moving said pin to move said element and vary the width of said raceway.

15. A rotary loop taker for a sewing machine comprising a rotatable body, a bobbin case carrier mounted therein and provided with a circumferentially extending bearing rib, a movable element housed in said body, said body and said element having cooperating portions forming the side walls of a raceway for said rib, a slidable pin supported by said body and engaging with said element, and power-operated means for moving said pin to move said element and vary the width of said raceway.

16. A rotary loop taker for a sewing machine comprising a rotatable substantially cup-shaped body having an axially disposed external hub portion, a substantially cup-shaped movable element nested in said body, said body and said element having cooperating portions forming a raceway, a bobbin case carrier mounted in said body and provided with a circumferentially extending rib engaging in said raceway, a plurality of circumferentially spaced slidable pins projecting through the base of said cup-shaped body and engaging the base of said cup-shaped element, and means carried by said hub portion of said body and engaging said pins and adjustable axially of said body to move said pins and said element to vary the width of said raceway.

17. A rotary loop taker for a sewing machine comprising a rotatable substantially cup-shaped body having an axially disposed external hub portion, a substantially cup-shaped movable element nested in said body, said body and said element having cooperating portions forming a raceway, a bobbin case carrier mounted in said body and provided with a circumferentially extending rib engaging in said raceway, a plurality of circumferentially spaced slidable pins project-

ing through the base of said cup-shaped body and engaging the base of said cup-shaped element, and means carried by said hub portion of said body and engaging said pins and adjustable axially of said body to move said pins and said element to vary the width of said raceway, said body and said element having cooperating means limiting the extent of relative movement between said body and said element.

18. A rotary loop taker for a sewing machine comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, a movable element operatively associated with said body and having a portion defining a side wall of said raceway, a movable member operatively associated with said body and engaging said element, and means for moving said member to move said element to vary the width of said raceway and including an electromagnetic device.

19. A rotary loop taker for a sewing machine comprising a rotatable substantially cup-shaped body having an axially disposed external hub portion, a substantially cup-shaped movable element nested in said body, said body and said element having cooperating portions defining a raceway, a bobbin case carrier housed in said body and provided with a peripheral bearing rib engaging in said raceway, an operating shaft for said body having a hollow portion extending in and secured to said hub and in communication with the interior of said body, a rod slidable in said hollow portion of said shaft and engaging said movable element, and means for moving said rod to move said element and vary the width of said raceway.

20. A rotary loop taker for a sewing machine comprising a rotatable substantially cup-shaped body having an axially disposed external hub portion, a substantially cup-shaped movable element nested in said body, said body and said element having cooperating portions defining a raceway, a bobbin case carrier housed in said body and provided with a peripheral bearing rib engaging in the said raceway, an operating shaft for said body having a hollow portion extending into said hub and in communication with the interior of said body, a rod slidable in said hollow portion of said shaft and engaging said movable element, and power operated means for moving said rod to move said element and vary the width of said raceway.

21. A rotary loop taker for a sewing machine comprising a rotatable substantially cup-shaped body having an axially disposed external hub portion, a substantially cup-shaped movable element nested in said body, said body and said element having cooperating portions defining a raceway, a bobbin case carrier housed in said body and provided with a peripheral bearing rib engaging in the said raceway, an operating shaft for said body having a hollow portion extending into said hub and in communication with the interior of said body, a rod slidable in said hollow portion of said shaft and engaging said movable element, and means for moving said rod to move said element and vary the width of said raceway and including an electromagnetic device and an operative connection between said device and said rod.

22. A rotary loop taker for a sewing machine comprising a rotatable substantially cup-shaped body having an external axially disposed hub portion, an operating shaft for said body and having a hollow portion extending in and secured to

said hub portion and in communication with the interior of said body, a movable substantially cup-shaped element nested in said body, said body and said element having cooperating portions defining a raceway, a bobbin case carrier mounted in said body and provided within a peripheral rib engaging in said raceway, a slidable rod mounted in said hollow portion of said shaft and engaging said movable element, the hollow portion of said shaft being provided with diametrically opposed axially elongated slots, an electromagnet embracing said hollow portion of said shaft, an armature slidable on said hollow portion on said shaft, and means carried by said armature and extending through said slots and said rod whereby movement of said armature moves said rod and shifts said element to vary the width of said raceway.

23. A rotary loop taker for a sewing machine comprising a rotatable substantially cup-shaped body having an external axially disposed hub portion, an operating shaft for said body and having a hollow portion extending in and secured to said hub portion and in communication with the interior of said body, a movable substantially cup-shaped element nested in said body, said body and said element having cooperating portions defining a raceway, a bobbin case carrier mounted in said body and provided with a peripheral rib engaging in said raceway, a slidable rod mounted in said hollow portion of said shaft and engaging said movable element, the hollow portion of said shaft being provided with diametrically opposed axially elongated slots, an electromagnet embracing said hollow portion of said shaft, an armature slidable on said hollow portion of said shaft, and means carried by said armature and extending through said slots and said rod whereby movement of said armature moves said rod and shifts said element to vary the width of said raceway; said body and said element having cooperating portions limiting movement of said element relative to said body while said armature is so located that it never contacts the pole pieces of said magnet.

24. A rotary loop taker for a sewing machine comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, a movable element operatively associated with said body and having a portion defining a side wall of said raceway, a movable member operatively associated with said body and engaging said element, and means for moving said member to move said element to vary the width of said raceway and including an electromagnetic device having pole pieces and an armature operatively connected with said member, said armature being so disposed relative to said pole pieces that it never contacts the latter.

25. In combination in a sewing machine, operating means for the sewing machine mechanism including a rotary loop taker; said loop taker comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, and means for maintaining the normal working width of said raceway or for enabling the width thereof to be enlarged; and operative connections between said last means and said operating means and including cooperating elements such that said last means functions to maintain the normal working width of said raceway only when the operating means is functioning to operate said sewing mechanism.

26. In combination in a sewing machine, a main driving electric motor, an electrical circuit for energizing and deenergizing said motor and including a switch, a rotary loop taker comprising a relatively rotatable body and bobbin case carrier, said body and carrier having a cooperating raceway and bearing rib, and means for varying the width of said raceway including a movable element operatively associated with said body and having a portion defining a side wall of said raceway; means for moving said element and including an electrically operated device, and means electrically connecting said device and said circuit intermediate said motor and said switch whereby said device is energized or deenergized simultaneously with the energization or deenergization of said motor.

27. A rotary loop taker for a sewing machine comprising a body and a bobbin case carrier relatively rotatable within said body, said body and

5 carrier being provided with a cooperating bearing rib and raceway therefor having its inner side wall movable, and means operatively associated with the loop taker for positively moving said inner side wall to positively maintain the normal working width of said raceway or to enable the width thereof to be enlarged.

10 28. A rotary loop taker for a sewing machine comprising a relatively rotatable cup-shaped body and bobbin case carrier mounted therein, said body and carrier being provided with a cooperating raceway and bearing rib, said raceway being formed in part by a movable element, and means operatively associated with said body and element and including a single operating member adjacent the closed end of said body for positively moving said element and adjusting the width of said raceway.

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