March 17, 1936. C. E. COLEGROVE ET AL 2,034,506

SEWING MACHINE

Filed April 10, 1933

FIG. 2

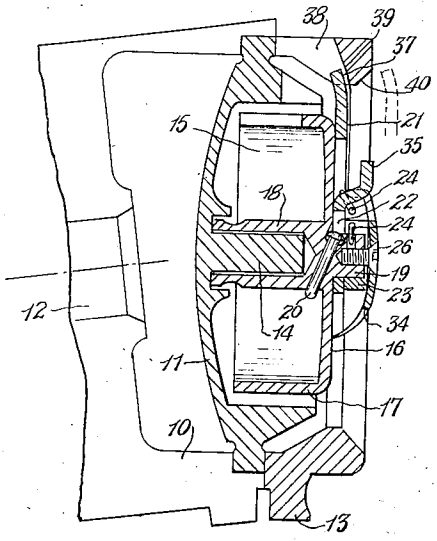
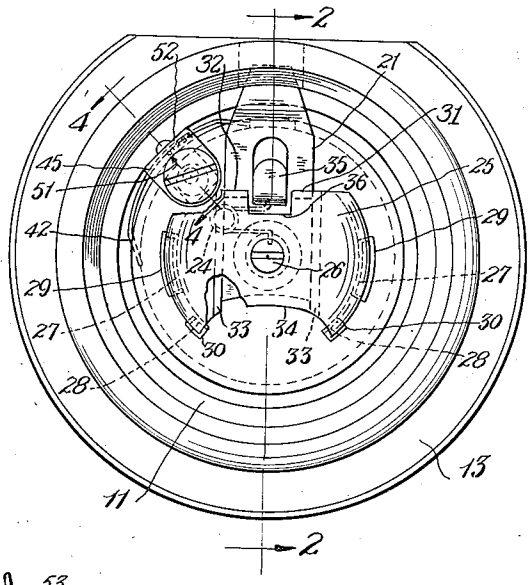


FIG. 1



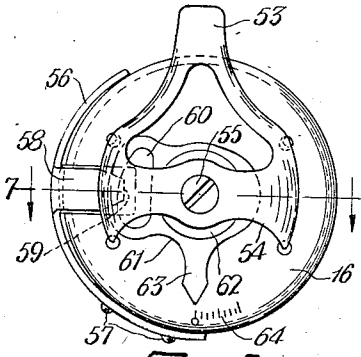


FIG. 5

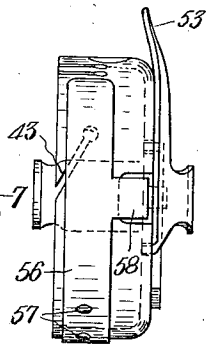


FIG. 6

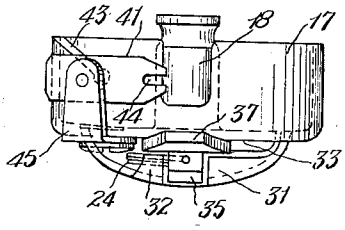


FIG. 3

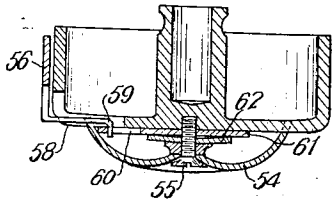


FIG. 7

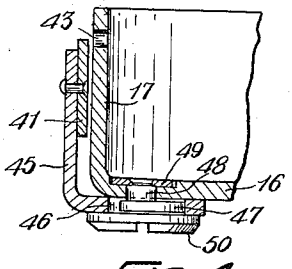


FIG. 4

INVENTORS:
CHARLES E. COLEGROVE
JOHN A. ANTEL

Kerr Hudson & Kent
ATTORNEYS

Patented Mar. 17, 1936

2,034,506

UNITED STATES PATENT OFFICE

2,034,506

SEWING MACHINE

Charles E. Colegrove, Lakewood, and
John A. Antel, Cleveland, Ohio

Application April 10, 1933, Serial No. 665,300

7 Claims. (Cl. 112—231)

This invention relates to improvements in sewing machines, and has reference particularly, to bobbin cases, latching means therefor, means for holding the bobbins in the cases, and thread tensioning means for use upon bobbin cases in sewing machines of the revolving shuttle, revolving hook, and oscillating shuttle types.

One of the objects of the invention is the provision of simple and effective means for latching a bobbin case to the cover of the rotary or oscillating shuttle raceway.

Another object is the provision of novel means for retaining the bobbin in the bobbin case while the latter is being inserted into or removed from the shuttle, the bobbin retaining means being actuated preferably simultaneously with the withdrawal of the retaining latch for the bobbin case.

Other objects and features of novelty will appear as we proceed with the description of those embodiments of the invention which, for the purposes of the present application, we have illustrated in the accompanying drawing, in which

Figure 1 is an elevational view of a shuttle mechanism embodying the invention;

Fig. 2 is a vertical sectional view of the same taken substantially along the line 2—2 of Fig. 1, this view being inclined slightly from the vertical, bringing the shuttle into a vertical plane, whereas in a machine it stands in a plane at a small angle to the vertical;

Fig. 3 is a top plan view of the bobbin case;

Fig. 4 is a fragmental sectional view on a larger scale, this view being taken substantially along the line 4 of Fig. 1.

Fig. 5 is a rear elevational view of a modified form of bobbin case.

Fig. 6 is a side elevational view of the construction shown in Fig. 5, and

Fig. 7 is a transverse sectional view taken substantially along the line 7—7 of Fig. 5.

In the drawing, a shuttle raceway is indicated at 10, wherein a shuttle 11 is mounted to rotate. The shuttle may be driven in any known or desired manner from a shaft 12, the driving mechanism forming no part of the present invention. 13 is a cover that is secured by any suitable means to the raceway 10, thereby holding the shuttle 11 in place. The shuttle has a central stem 14.

The bobbin case, to which we have applied generally the reference numeral 15, comprises a rear wall 16 that is flat for the most part, a cylindrical side wall 17, and a central hub having a portion 18 within the bobbin case and a portion 19 extending rearwardly from the case. The portion 18 is hollow in order to receive rotatably the stem 14 of the shuttle.

A hole is drilled diagonally through the rearwardly extending portion 19 of the hub into the forward portion 18 thereof, and out in front of the rear wall 16 of the case. In this hole is slidably mounted a pin 20 which has a rounded lower extremity or other cam surface, while the upper end of the pin is slightly enlarged to prevent its entering the hole beyond the extent illustrated in Fig. 2.

A latch plate or finger 21 is arranged to slide radially upon the rear surface of the bobbin case 15, being provided with a slot 22 which is of a proper width to freely receive the rear portion 19 of the hub on the bobbin case. In order to hold the latch 21 against the rear surface of the case a collar or washer 23 is mounted upon the hub 19 behind the latch 21. The latch is urged radially outward by a spring 24.

The part 25 is a dome that is secured by means of screw 26 to the hub 19. At its edges this dome may be provided with tongues 27 and 28 which fit into slots 29 and 30, thereby fixing the dome against rotation about the screw 26. The dome 25 holds in place the washer 23, and at its forward end it may have inwardly turned lips 31 and 32 which act as guides to assist in holding the latch plate 21 against the rear wall of the case. We may attach guide strips 33 to the rear wall of the case underneath the dome 25 on one or both sides of the latch plate 21, for the purpose of guiding the movements of the latter in a straight radial path, but as will be obvious, these guides may be carried by the dome 25 if desired. The rear end of the dome is cut away at 34 so as to provide a thumb hold.

Just forward of the dome we strike up out of the latch plate 21 a lip 35, which serves as a finger hold and latch retractor. The forward edge of the dome is preferably cut away at 36 in order to clear the finger hold 35 when the latch is retracted.

We remove the corners at the forward end of the latch to provide a more or less tapered extremity, and this extremity is deflected inwardly as shown at 37 in Fig. 2. The extremity of the latch is adapted to enter a socket or recess 38 in the cover 13, and the wall of the socket with which the latch engages is also beveled, as indicated at 39, so as to impart an inward force to the latch when the operator permits it to be extended by the spring 24. The outer surface of the cover 13 is also beveled at 40, so that if the latch is not retracted when the operator inserts

the bobbin case into the shuttle, the latch will be cammed backward to pass through the opening in the cover 13, the dotted line position of the latch in Fig. 2 indicating how the latch approaches the beveled surface 40 when the latch is not positively retracted. When the operator retracts the latch the head of the pin 20 is engaged by the rear end of the latch and the pin is forced inwardly of the bobbin case and into tight engagement with a bobbin arranged upon the hub 18. The pin 20 thus acts to retain the bobbin in the case until the case has been secured in the shuttle.

We employ a thread tensioning device which comprises a spring 41 that is preferably secured or anchored at its rear end 42 to the cylindrical wall 17 of the case. This spring has a natural radius of curvature less than the radius of curvature of the cylindrical wall 17, so as to be arched upon that wall as indicated in Fig. 1. The thread from the bobbin (not shown) extends through a slot 43 in the case and runs along from the inner end of that slot beneath spring plate 41 to the notch 44 in the spring plate. 45 is an angle bracket which may be secured in some manner, as by riveting, to the spring 41, and has one arm extended along the rear wall 16 of the case toward the center of the latter. In this radial arm or bracket 45 there is an opening 46 which receives a cam or eccentric 47 that is carried by or is integral with a short shaft 48, which is rotatably mounted in an opening in the rear wall 16 of the case. On its forward surface this wall is preferably recessed around the shaft opening in order to receive a washer 49 flush with the surface of the wall, and the inner end of the washer may be riveted over so as to prevent the shaft from being pulled out of the case. On its outer end the shaft 48 has a relatively large head 50 which may be slotted to take a screw-driver, this head overhanging the opening 46. It will be obvious that as the head 50 is rotated in one direction by means of a screw-driver, the cam 47 will exert an inward pull on the bracket 45 and press the spring 41 toward the wall 17 of the case, thereby increasing the thread tension, and that as the cam is rotated in the opposite direction the resiliency of the spring 41 will cause it to bow outwardly again, thereby relieving the tension. In order to assist the operator in making this adjustment, we may provide an index hand 51 on the head 50 of the adjusting shaft and a scale 52 on the bracket 45.

In the modification of Figs. 5, 6 and 7, we have illustrated a somewhat different form of tensioning means. In these figures the bobbin case does not have a rearwardly extending hub portion, and the latch member 53 is not retractable, but is part of a stamping which includes a bowed member 54, having prongs entering holes in the back wall of the case, which member is fastened to the case centrally of the latter by means of a screw 55.

The tensioning spring 56 is more or less similar to spring 41, being secured to the case at one end by means of rivets 57, and having a slightly arched portion which covers the major part of slot 43 through the cylindrical wall of the case. In this instance, instead of attaching a separate bracket to the spring, we form a bracket arm 58 integral with the spring, and bend it to extend toward the center of the case. On its inner extremity however it is provided with a flange 59 which extends into a slot 60 in an adjusting plate 61. The plate 61 is provided with an aperture to loosely receive screw 55, and a spring washer 62 tends to hold it in any given position of adjustment. The outer side of the slot 60, with which the flange 59 engages, is formed eccentrically so as to have a camming effect upon the flange 59 when the plate 61 is rotated about its pivotal mounting. A pointer arm 63 constitutes a handle by means of which the plate may be conveniently rotated, and also cooperates with a gauge scale 64 on the rear wall 16 of the case for indicating the tension provided by various adjustments. It will be obvious that as the pointer arm 63 is swung toward the right in Fig. 5, the flange 59 on the inner end of bracket arm 58 will be drawn toward the center of the case, thereby drawing the tensioning spring 56 down upon the cylindrical surface of the bobbin case and increasing the thread tension, whereas movement of the pointer 63 toward the left leaves the spring 56 free to bow itself outwardly again, thereby relieving the tension.

Having thus described our invention, we claim:

1. In a sewing machine, a shuttle raceway, a cover therefor, a bobbin case, said cover having a socket therein, a radially slidable latch mounted on the outer side of the bobbin case, said latch being adapted to enter said socket, means tending to move said latch radially outward, a finger hold projecting from said latch, and a fixed projection in said bobbin case opposite said finger hold, whereby the bobbin case may be handled and the latch retracted at the same time by the thumb and finger of an operator's hand.

2. In a sewing machine, a shuttle raceway, a cover therefor, a bobbin case having an outwardly extending hub, said cover having a socket therein, a radially slidable latch provided with a slot in which the said hub is slidably received, the outer end of said latch being adapted to enter said socket, means mounted on said hub overlying said latch to hold it against the outer face of the shuttle case, means tending to move said latch radially outward, means for guiding the latch, and an outwardly projecting finger hold on the latch by means of which it may be retracted.

3. In a sewing machine, a shuttle raceway, a cover therefor, a bobbin case having an outwardly extending hub, said cover having a socket therein, a radially slidable latch provided with a slot in which said hub is slidably received, the outer end of said latch being adapted to enter said socket, a dome mounted upon said hub and having edge portions engaging said bobbin case, spring means interposed between said case and latch tending to move the latch radially outward, said spring means being covered by said dome, and an outwardly projecting finger hold on the latch in front of the dome, said dome being formed on the opposite side to afford a thumb hold for the operator.

4. In a sewing machine, a shuttle raceway, a cover therefor, a bobbin case, said cover having a socket therein, a radially slidable latch mounted on the outer side of the bobbin case, said latch being adapted to enter said socket, means tending to move said latch radially outward, a finger hold on the latch to facilitate its retraction, said latch and socket having inclined engaging surfaces tending to force the bobbin case inwardly as the latch moves outwardly to operative position.

5. In a sewing machine, a bobbin case having a central inner hub, said hub having an inclined perforation therethrough from the back of the

case to the front thereof, a pin in said perforation, a retaining latch slidably mounted on the back of the case, and means upon said latch adapted to engage the outer end of the pin and force it inwardly when the latch is retracted.

6. In a sewing machine, a bobbin case having a central hub extending both inwardly and outwardly, said hub having an inclined perforation therethrough extending from the back of the case into the front of the case, a pin slidably mounted in said perforation, said pin being slightly longer than the perforation and having a rounded inner extremity, whereby it will be cammed outwardly when a bobbin is pushed onto the inner part of said hub, a latch slidably mounted on the outer surface of the bobbin case, and having a slot therethrough for the reception of the outer portion of said hub, the latch at one end of the slot being adapted to engage the outer extremity of the pin and push it inwardly when the latch is retracted.

7. In combination, a bobbin case having a central hub extending both forwardly and rearwardly from the rear wall of the case, said hub having a perforation extending diagonally therethrough from behind the rear wall of the case into the interior of the case, a pin of slightly greater length than the length of said perforation slidably mounted in said perforation, said pin having a cam surface at its inner end, whereby it is adapted to be slid outwardly when a bobbin is pushed onto said hub within the case.

CHARLES E. COLEGROVE.
JOHN A. ANTEL.