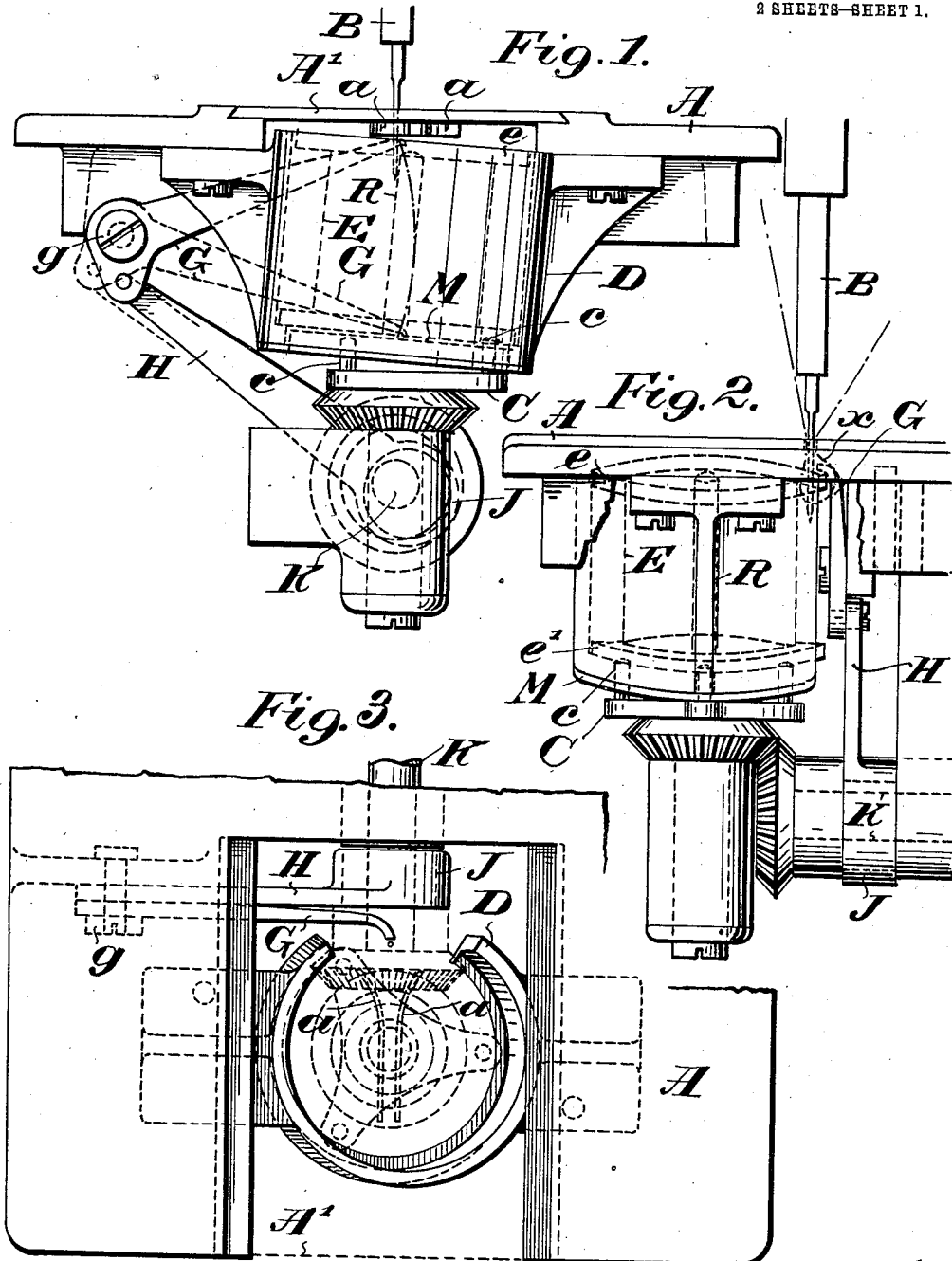


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SEWING MACHINE.
APPLICATION FILED JUNE 17, 1911.

1,065,655.

Patented June 24, 1913.
2 SHEETS—SHEET 1.



Witnesses.

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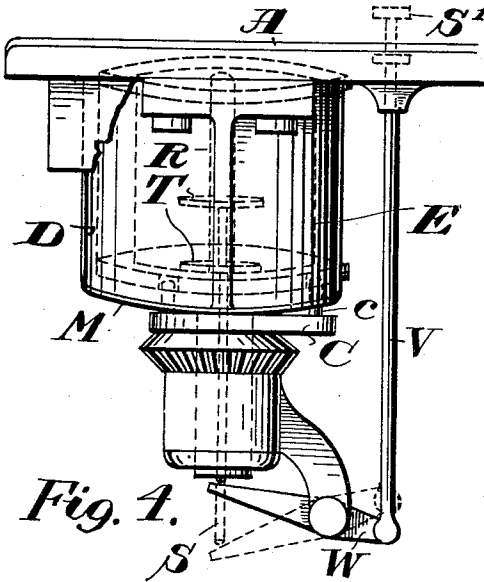


Fig. 1.

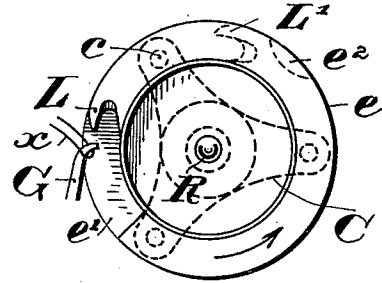


Fig. 5.

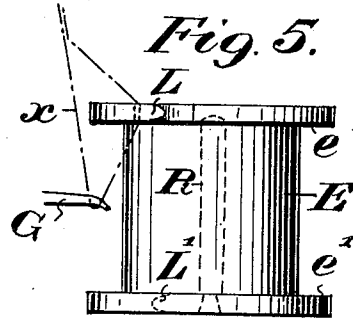


Fig. 6.

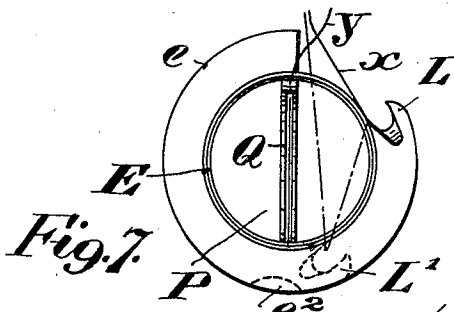


Fig. 7.

Fig. 8.

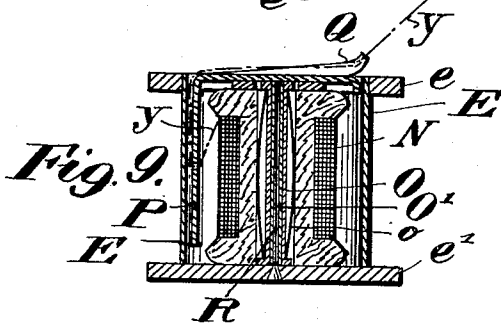
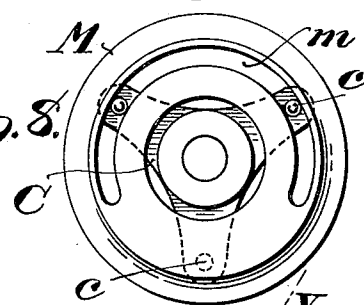
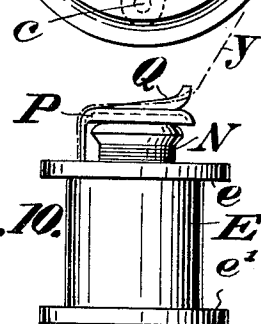


Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

FREDERICK J. T. BELL, OF BURY, AND HARDY C. BELL, OF PADIHAM, ENGLAND.

SEWING-MACHINE.

1,065,655.

Specification of Letters Patent.

Patented June 24, 1913.

Application filed June 17, 1911. Serial No. 633,769.

To all whom it may concern:

Be it known that we, FREDERICK JOHN TURNER BELL, a resident of Bury, and HARDY CECIL BELL, a resident of Padiham, both in the county of Lancaster, England, have invented new and useful Improvements in Sewing-Machines, of which the following is a specification.

This invention relates to that class of sewing machine which is known as the two-reel lock stitch, and in which the underthread is placed in the form of a cheese, bobbin spool, cop or the like in which it comes from the manufacturer within a rotary casing which is driven in such a manner by means intermittently engaging with and disengaging from it that the loop of needle thread formed by it can pass completely around and over the casing.

More particularly this invention relates to that type of machine in which the rotary casing or holder which contains the bobbin or the like of underthread is rotated by means of pins mounted in a face plate or equivalent rotating on an axis which is inclined to the axis of rotation of the casing or bobbin holder so that the pins alternately engage with and disengage from corresponding driving holes in the holder or casing so as to permit, in their disengaged positions, the formation of a loop of needle thread around such holder or casing and the disengagement therefrom of the loop so formed.

This invention relates to a casing or holder of the construction disposition and arrangement hereinafter described and any requisite accessories so as to permit the bobbin or the like (hereinafter called a bobbin) of underthread to be put into place within or be withdrawn from the casing or holder vertically or about vertically through the bed plate of the sewing machine. Devices may also be provided for preventing the loop of thread from such a bobbin fouling the driving pins.

The accompanying drawings illustrate how our improvements may be carried into effect.

Figures 1 and 2 are elevations at right angles to each other of the race or the like which contains the rotating bobbin casing. Fig. 3 is a plan view of such part. Fig. 4 is a view illustrating the parts by which a bobbin carrier is removed from the bobbin casing. Figs. 5, 6, 7 are different views of

the rotary bobbin casing, Fig. 6 showing it without its bobbin carrier. Fig. 8 is a plan view of a guard plate which prevents the loop of needle thread, while passing around the rotary bobbin casing, from dropping into and being entangled with the driving gear. Fig. 9 is a sectional view of the rotary bobbin casing with the stationary bobbin carrier and the bobbin in place. Fig. 10 is a view of the bobbin casing with the bobbin carrier and bobbin half lifted out.

Referring to the drawings A is the bed plate of the machine.

B is the needle bar.

C is a rotary face plate provided with pins *c* projecting from its upper face disposed to alternately enter and leave holes in the bottom of the rotary needle casing in such a manner that one of such pins at least is in engagement with the casing to drive it while the other or others is or are out of engagement therewith to permit the proper passage of the needle thread loop around the casing and over the underthread. Such an arrangement is well known and needs no further description here.

In the drawings we have shown the face plate provided with three driving pins, the bottom of the rotary casing being correspondingly perforated, but it is to be understood that this arrangement of three pins for driving is not herein claimed.

D is a box or casing attached to the underside of the bed plate with its axis slightly angularly inclined to the vertical axis of the driving plate C. This box serves as a race in which the rotary bobbin casing rotates and is formed with a gap at one side for the needle to enter and primarily form the needle thread loop in the usual manner. E is the bobbin casing concentrically placed within the box D to rotate therein and driven by engagement with the driving pins *c* of the face plate C in the manner already indicated. By this arrangement of race and bobbin casing the bobbin which is placed in the casing as later described can be withdrawn about vertically from its casing when desired through an opening in the bed plate, which opening is normally covered or closed by a sliding plate A¹.

G is an arm mounted on the center *g* and capable of being operated through a connecting link H from an eccentric J mounted on the shaft K from which the driving face plate C is driven, so that the arm G is

capable of movement downward and up again so as to occupy the two extreme positions indicated in Fig. 1 for each rotation of the driving face plate and the bobbin casing. The end of this arm enters the loop of needle thread as soon as it is formed and pulls it downward as hereinafter described. The bobbin casing is provided with upper and lower flanges e e' in each of which is formed a hook L L' , the hook L' on the lower flange being somewhat in rear of the hook L on the upper flange in the direction of rotation. There is a gap in each flange in front of its hook.

The operation of the apparatus illustrated is as follows:—The loop of needle thread x is first formed in the gap of the race or box D in the usual manner, the gap preceding the upper hook L of the rotating casing having at this time also arrived at the gap in the race to permit this. The end of the downward oscillating arm G then enters the loop thus formed and draws it downward. The needle having risen the hook L of the upper flange of the casing engages with the needle thread loop and begins to carry it around with it, in its rotation. Fig. 5 shows the upper hook just about to enter the needle loop which is being drawn downward by the arm G . As the rotation of the casing continues the arm G continues to descend. Fig. 6 shows the arm about half way down its stroke and shows how the first upper hook L has carried the needle thread loop with it partly around its path of rotation. As the rotation of the casing and the downward movement of the arm both continue the arm passes downward through the gap formed in the lower flange before the hook in such flange and such lower hook in turn engages with the needle thread loop in the manner similar to that in which it has been engaged by the upper. When this engagement of the lower hook is effected the arm begins to rise (passing upward through the small gap e^2 formed in the lower flange) and is completely disengaged from the needle thread loop which is now being carried around by the casing over its upper surface and under its lower surface. See Fig. 7. When the rotation is almost completed the needle thread is slid and pulled completely over the casing by the pull of the take up motion of the machine (not shown) and is passed over the underthread y which is issuing from the bobbin carrier within the rotary casing. The described operations are then repeated.

M is a guard plate which is a fixture at the bottom of the box or race D and on which the rotary bobbin casing rotates and rests. In the form shown this plate is rectangularly dished but it may be flat. This plate is provided with a slot m concentric to its center as shown in Fig. 8, such slot being of such di-

mensions and being so formed that although it permits the passage through it of the driving pin c to engage with the bottom of the rotary casing E it is solid or unbroken where the pins are disengaged from such casing. Thus although it affords an opening for the engaging pins it is solid over the disengaged pins and prevents the passage of the needle loop thread downward on to the tops of the disengaged pins.

The bobbin N of underthread is forced over spings o placed on the outside of a tube O which rotates upon a second tube O' which is rigidly secured to the body P of the bobbin carrier. Such tube O' in turn is placed over the axial pin R which is rigidly secured to the rotary casing. See Fig. 9. Such pin is thus capable of smoothly and concentrically rotating within the bobbin carrying tubes and the bobbin itself freely rotates. The body of the bobbin carrier P is slotted to permit the threading of the underthread y of the bobbin N through it as indicated, and the thread is then led away by being placed in a slit along a rib Q on the top of the bobbin carrier as shown in Figs. 7 and 9. To prevent the bobbin carrier rotating when in use projections or lugs a a on the under side of the cover plate A' come one on each side of such rib Q when the bobbin carrier and the cover plate are both in place. See Fig. 1. The position of these lugs is also indicated by the dotted lines a a in Fig. 3. These lugs and the ribs only fit loosely together so that the loop of needle thread can be easily pulled between them. They are of course smooth and rounded. The lugs a a open out widely at the leading ends so that they will always engage with the rib Q on the top of the bobbin carrier.

The bobbin carrier P and its bobbin may be lifted axially and vertically out of its casing by means of the rib Q but to enable it to be more easily disengaged than by such lifting it may be lifted by the rod S which passes axially upward through the shaft of the face plate C and up into the pin R which is made hollow for the purpose. Fig. 4. This pin is slotted and a cross pin attached to a loose disk T passes through such slot and rests upon the upper end of the rod S . The bobbin carrier rests on this disk T . The rod S can be moved upward to raise the disk T to the higher position indicated in Fig. 4 and consequently also lift the bobbin by pressure on the finger piece S' which pressure and the consequent movement is transmitted to the rod S through the rod V and the two armed lever W . On the pressure being relieved from the finger piece this finger piece rises, the rod V falls by gravity or by spring pressure and the bobbin carrier may be put properly into place within the casing E through the upper

opening of the latter. The rod is a loose fit in the axial bores of the face plate shaft and the pin R and it may be bent or flexibly jointed.

5 What we claim is:—

10 1. The improvements in sewing machines comprising a rotary bobbin casing having upper and lower hooks, a reciprocating arm for moving the needle thread loop from the upper hook to the lower one, and driving means for the rotary casing which driving means are intermittently in and out of engagement with the rotary casing in such a manner that the loop of needle thread 15 passes completely over and around said casing, substantially as set forth.

20 2. The improvement in sewing machines, comprising a rotary bobbin casing having upper and lower hooks, a reciprocating arm for moving the needle thread loop from the upper hook to the lower one, and driving means comprising pins which alternately engage with and disengage from the bobbin casing in such a manner that the loop of 25 needle thread passes completely over and around said casing, substantially as set forth.

30 3. The improvement in sewing machines, comprising a rotary bobbin casing having upper and lower hooks, a reciprocating arm for moving the needle thread loop from the

upper hook to the lower one, driving means comprising pins which alternately engage with and disengage from the bobbin casing in such a manner that the loop of needle 35 thread passes completely over and around said casing, and a guard plate to prevent the needle thread loop fouling the driving means, substantially as hereinbefore described.

40 4. The improvement in sewing machines, comprising a rotary casing having upper and lower hooks, a reciprocating arm for moving the needle thread loop from the upper hook to the lower one, driving means 45 for the rotary casing which driving means are intermittently in and out of engagement with the rotary casing in such a manner that the loop of needle thread passes completely over and around said casing, a 50 bobbin carrier contained in said rotary casing, and means for lifting the bobbin carrier in said casing, substantially as hereinbefore described.

55 In witness whereof we have hereunto set our hands in the presence of two subscribing witnesses.

FREDERICK J. T. BELL.
HARDY C. BELL.

Witnesses:

JOHN O'CONNELL,
LLEWELLYN THOMAS.