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ROTARY HOOK MECHANISM FOR SEWING MACHINES

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2 Sheets-Sheet 2

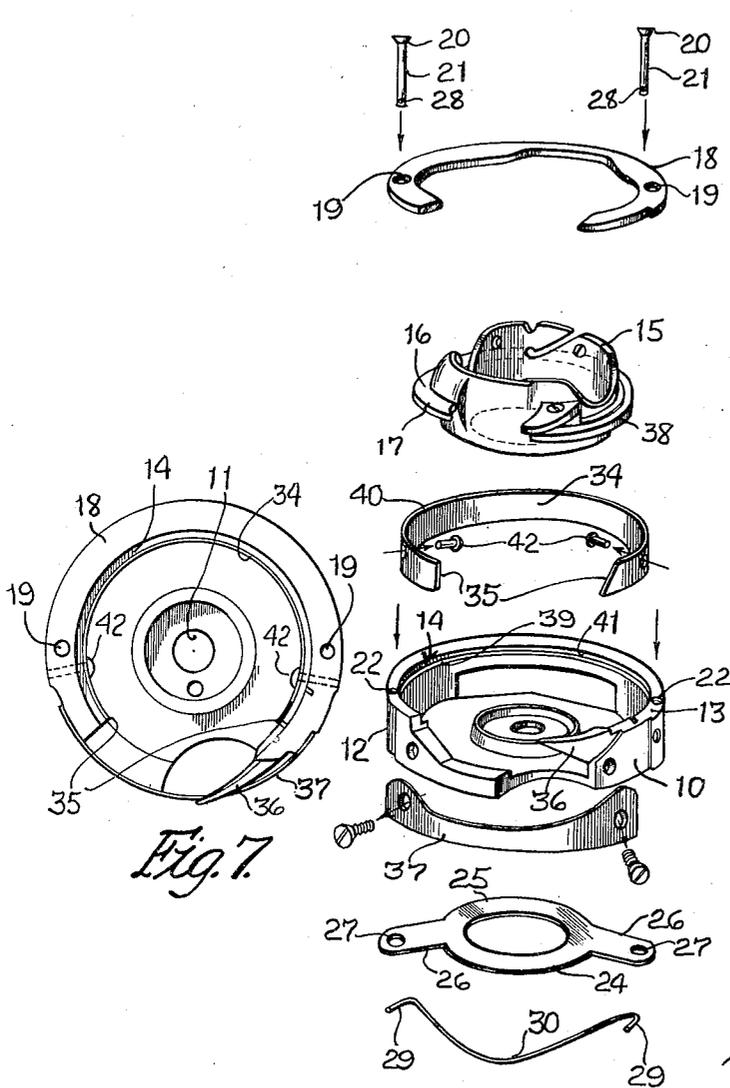


Fig. 6.

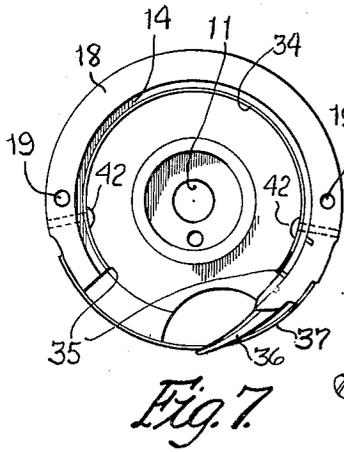


Fig. 7.

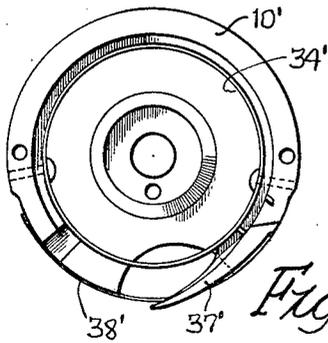


Fig. 8.

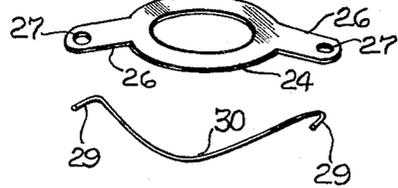


Fig. 9.

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ROTARY HOOK MECHANISM FOR SEWING MACHINES

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This invention relates to rotary hook mechanism for sewing machines. More particularly the invention has to do with a simplified construction for associating a bobbin case with the rotary hook, this being accomplished in a manner such as will eliminate clashing between the bobbin case and the rotary hook, the contemplated construction having a predetermined tolerance or clearance between the bobbin case and the hook such as will eliminate interference of the rotary hook with respect to the bobbin case by reason of the admission between the bobbin case and the rotary hook of foreign matter such as the lint from the thread.

In the operation of sewing machines there is always present a certain amount of lint from the thread. A certain amount of this lint between operating parts of the machine finds its way between the bobbin and the rotary hook. The constant accumulation of this lint will eventually interfere with the proper operation of the hook, requiring the bobbin and rotary hook to be frequently disassembled to permit removal of the accumulated lint, this being particularly so where the relation between the bobbin case and the rotary case is of precision construction allowing no tolerance or clearance between the operating parts of the assembly.

Not only is it an object of my invention to provide a simplified construction to prevent clashing between the bobbin case and the hook, but it is also an equally important object of the invention to arrange the bobbin case with respect to the rotary hook in a manner such as will eliminate in a large measure interference of the rotary hook with respect to the bobbin case caused by the accumulation of lint or pieces of thread. In accomplishing this latter object, I dispense with the necessity of providing the usual thread cutters in the trackway of the hook.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a top plan view of the hook and bobbin case in assembled relation with respect to each other;

Fig. 2 is a bottom plan view of the same;

Fig. 3 is a sectional detail view taken substantially on line 3—3 of Fig. 1;

Fig. 4 is a sectional detail view taken substantially on line 4—4 of Fig. 1;

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Fig. 5 is a side elevational view of the same taken substantially on line 5—5 of Fig. 1;

Fig. 6 is an exploded view illustrating the several parts comprising the invention;

Fig. 7 is a plan view of the hook with the bobbin case removed;

Fig. 8 is a plan view similar to Fig. 7, but illustrating a modified form of construction; and

Fig. 9 is a perspective view of the track ring embodied in the form of construction shown in Fig. 8.

I prefer to accomplish the several objects of my invention by the preferred forms of construction shown in the accompanying drawing. In this connection, the rotary hook is indicated at 10. In the bottom wall thereof is a centrally located opening 11 which receives the hook operating shaft (not shown) of the sewing machine. This hook provides side walls 12 having a relatively flat top surface 13. This side wall 12 provides a housing groove 14.

The bobbin case is indicated at 15. This bobbin case provides a laterally extending flange 16, the peripheral edge 17 of which extends into the groove 14 and is retained therein by a gib ring 18 of relatively flat formation and yieldably held in engagement with the top edge 13 of the wall 12 of the hook 10. This is accomplished by providing in the gib ring 18 perforations 19 providing seats for tapered edges 20 of connecting pins 21 projected through the perforations 19 and through the openings 22 formed in the side walls 12.

A spring plate 24 provides a central hub 25 from which extend in opposite directions with respect to each other the arms 26. These arms 26 are perforated as at 27 and through these perforations 27 extend the ends of the pins 21. The ends of the pins 21 which project through the perforations 27 are each provided with a transverse opening 28 to receive the angled end portions 29 of a connecting wire 30 whereby to complete the yieldable connection between the gib ring 18 and the hook 10.

The plate 24 is normally buckled in the form shown in Figs. 3 and 6 to bear the arms 26 against the angled end portions 29 of the connecting wire 30 and is of a degree of resiliency which, while effectively yieldably holding the gib ring flatly in contact with the top edge 13 of the hook 10, may be pressed back upon the bottom wall of the hook to facilitate removal of the wire 30 with respect to the pins 21 to permit removal of the gib ring 18. The flange 16 of the bobbin case 15 provides a tracking groove 31 formed in the

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underside 32 thereof. Positioned against the inside surface 33 of the wall 12 is a track ring 34, the top edge of which extends into the groove 14.

In the form shown in Figs. 1 to 6 inclusive, this track ring 34 is of split formation, the ends 35 of which are spaced from each other and when in assembled position in the hook are disposed on opposite sides of the hook 36 and thread guide 37. The outer wall 38 of the flange 16 provided by the formation of the groove 31 therein, normally rides on the bottom wall 39 of the groove 14, the top edge 40 of the track ring being slightly spaced from the flange 16. As shown in Figs. 3 and 4 particularly, a clearance is provided between the outer wall 38 and the outer side surface of the track 34. Likewise, a clearance is provided between the wall 38 and the adjacent wall 41 of the wall 12. The clearance between the track 34 and the wall 38 is less than the clearance between the walls 38 and 41. Should the hook by reason of centrifugal force or by other mechanical agencies be caused to shift laterally with respect to its central axis, clashing of the flange 16 against the wall 12 of the hook will be prevented by the engagement of the wall 38 with the track ring 34 and as there is a clearance between the gib ring 18 and the flange 16, no clashing between these parts can take place.

Should thread or lint from the material being worked upon, find its way into the spaces provided by the several clearances hereinbefore referred to, such thread or lint will not be accumulated in such clearances so as to interfere with the rotation of the hook 10 but will be effectively worked out of the clearances without in any way retarding the rotation of such hook. The gib ring 18, being yieldably connected to the hook, will be permitted by the spring plate 24 to yield a sufficient distance to free any thread or lint.

By the construction herein set forth, it is apparent that my improved hook and bobbin case assembly is substantially non-clogging and non-clashing. The tracking ring 34 is connected to the hook by means of suitable rivets 42. It is preferably formed of such material as will best serve the purpose.

In the modified form of construction shown in Figs. 8 and 9, the track ring 34' is formed in one piece and likewise adapted to be secured in place by suitable rivets. In making this track ring 34' in one piece, the top edge 35' tapers a predetermined degree to provide a narrow section 36' adapted to be disposed adjacent the hook 37' and thread guide 38'. The hook 10' is otherwise constructed in the same manner as that shown in Figs. 1 to 7 inclusive.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. For a combination comprising a rotary hook having side walls providing adjacent the top edge thereof a groove, a bobbin case having a flange projecting into said groove and said flange providing in its undersurface a groove, a gib ring for retaining said flange in the groove of the rotary hook, and a tracking member carried by

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the hook and having an edge portion engaging in the groove formed in the underside of said flange, said flange being spaced from the adjacent side walls of the groove in said hook and the top edge of said tracking member being normally spaced from the walls of the groove of said flange so that upon lateral shifting movement between said bobbin case and said hook said tracking member will restrain said flange from contacting said side walls of the groove of said hook.

2. For a combination comprising a rotary hook having side walls providing adjacent the top edge thereof a groove, a bobbin case having a flange projecting into said groove and said flange providing in its undersurface a groove, a gib ring for retaining said flange in the groove of the rotary hook, and a tracking member carried by the hook and having an edge portion engaging in the groove formed in the underside of said flange, there being a clearance between the flange and the side walls of the groove of said hook and between said flange and the said gib ring and between the top edge of said tracking member and the groove of said flange.

3. For a combination comprising a rotary hook having side walls providing adjacent the top edge thereof a groove, a bobbin case having a flange projecting into said groove and said flange providing in its undersurface a groove, a gib ring for retaining said flange in the groove of the rotary hook, and a tracking member carried by the hook and having an edge portion engaging in the groove formed in the underside of said flange, said flange being spaced from the adjacent side walls of the groove in said hook and the top edge of said tracking member being normally spaced from the walls of the groove of said flange so that upon lateral shifting movement between said bobbin case and said hook said tracking member will restrain said flange from contacting said side walls of the groove of said hook, and means for yieldably connecting the gib ring to the hook.

4. For a combination comprising a rotary hook having side walls providing adjacent the top edge thereof a groove, a bobbin case having a flange projecting into said groove and said flange providing in its undersurface a groove, a gib ring for retaining said flange in the groove of the rotary hook, a tracking member carried by the hook and having an edge portion engaging in the groove formed in the underside of said flange, there being a clearance between the flange and the side walls of the groove of said hook and between said flange and the said gib ring and between the top edge of said tracking member and the groove of said flange, and means for yieldably connecting the gib ring to the hook.

5. For a combination comprising a hook member having a side wall providing an internal groove, a bobbin case having a flange projecting into the groove and having riding contact with the bottom wall of said groove, said flange providing in its underside a groove, and a ring provided by said hook member and having an edge portion projecting into the groove of said flange, there being a clearance between said flange and the side wall of the groove of the hook member and a clearance between said top edge of said ring and the groove in said flange.

6. For a combination comprising a hook member having a side wall providing an internal groove, a bobbin case having a flange projecting

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into the groove and having riding contact with the bottom wall of said groove, said flange providing in its underside a groove, a ring provided by said hook member and having an edge portion projecting into the groove of said flange, there being a clearance between said flange and the side wall of the groove of the hook member and a clearance between said top edge of said ring and the groove in said flange, and means for yieldably retaining said flange in the groove of said hook member and for retaining the edge of said ring in the groove of said flange.

CHARLES H. PETSKEYES.

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