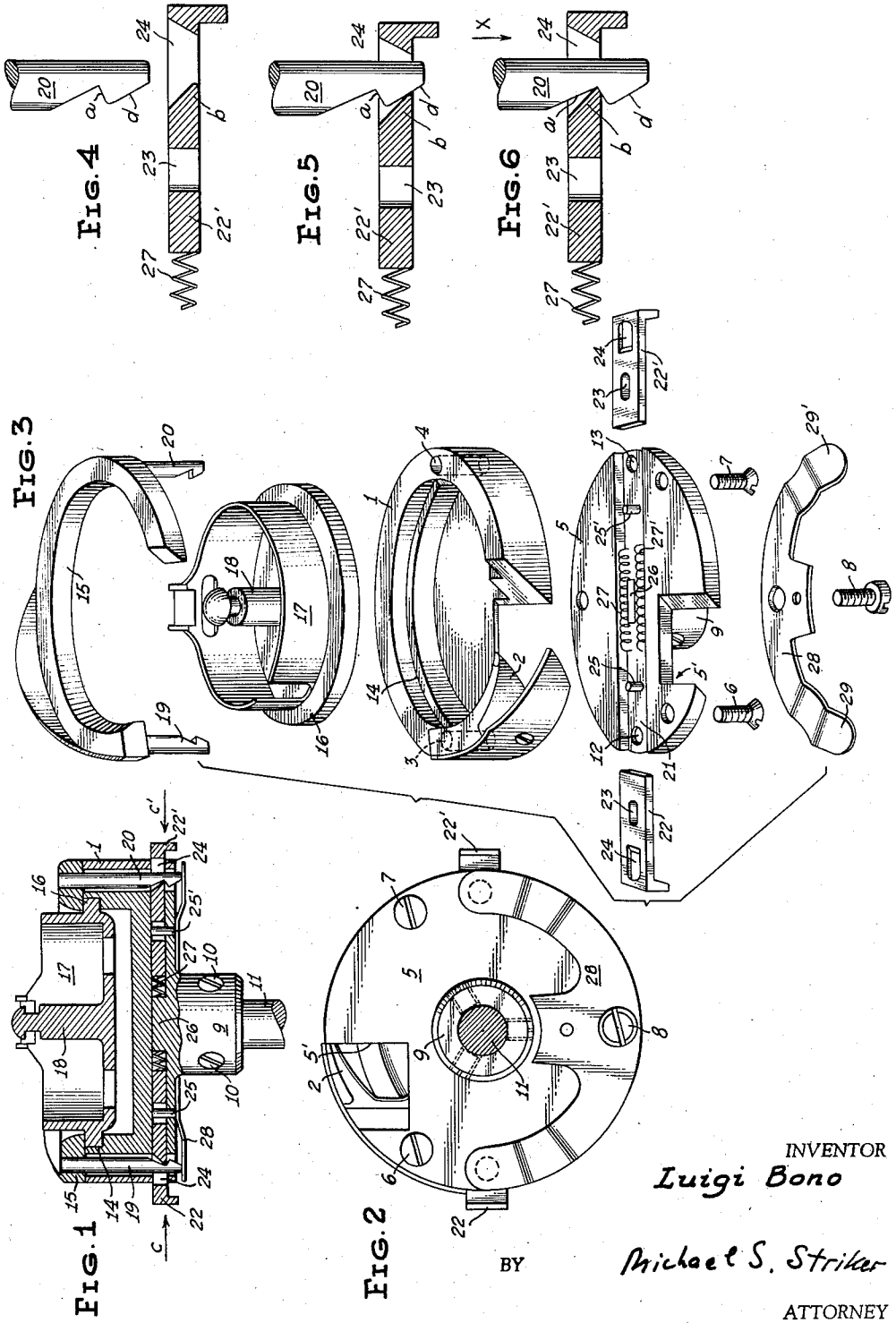
Jan. 20, 1959 L. BONO 2,869,495

ROTARY HOOK FOR SEWING MACHINES

Filed May 10, 1955



INVENTOR
Luigi Bono

BY Michael S. Striker

ATTORNEY

United States Patent Office

2,869,495

Patented Jan. 20, 1959

2,869,495

ROTARY HOOK FOR SEWING MACHINES

Luigi Bono, Pavia, Italy, assignor to Vittorio Necchi S. p. A., Pavia, Italy, a firm

Application May 10, 1955, Serial No. 507,367

Claims priority, application Italy April 2, 1955

4 Claims. (Cl. 112—230)

This invention concerns a rotary hook for double thread locked stitch sewing machines.

The usual rotary hooks are the widely known type consisting of a rotary unit, with take-up hook; a fixed bobbin case holder with an edge strips coupled with the throat of the rotary unit; and a bobbin-case holder retainer ring usually fixed by means of screws to the rotary unit; fianlly, the bobbin case containing the bobbin on which the under thread is wound, which is slipped into the bobbin case holder. The take-up hook rotates and catches the thread from the needle, winds it round the bobbin case holder and locks it with the under thread.

To clean moving parts touching one another, that is the edge strip of the bobbin case holder and the throat of the rotary unit, from dust, threads, fluff, etc. the bobbin case holder has to be taken out of the rotary unit.

This involves the use of tools to remove the retainer screws from the bobbin case holder retainer ring on the usual type of rotary hook, or other troublesome and lengthy operations which are inconvenient both in the home and for industrial purposes.

The rotary hook dealt with by this invention does away with these drawbacks, being characterised by the fact that the bobbin case holder retainer ring is detained on the rotating shaft by at least one retaining organ of the spring-loaded type so that the parts are released by means of the retaining organ movement opposing the spring-loaded unit which fixes the retainer ring in place.

The following description of the invention refers to the attached drawing, given merely by way of example without in any way limiting the scope of the invention.

Fig. 1 shows a cutaway view of a rotary hook according to the invention.

Fig. 2 shows the plan, seen from beneath.

Fig. 3 is a perspective view of the component parts of the rotary hook, positioned ready for assembly.

Figs. 4, 5 and 6 are cross-sections of three different positions of the connecting organ retaining the bobbin race on the rotary hook.

The rotary hook 1 has a take-up hook 2 and two through holes 3 and 4. It is fixed to flange 5 by means of three screws 6, 7 and 8. This flange has a relief 5' and a collar 9 fixed by screws 10 to the shaft 11 which rotates continuously by means of well-known elements.

Flange 5 further has two holes 12 and 13 parallel with the axis of the unit and located so that when the flange is fixed to the rotary unit 1 by screws 6, 7, 8 the holes 3 and 4 are respectively coaxial with holes 12 and 13 which are of the same diameter.

Rotary hook 1 is built with a relief 14 around it, partly closed at the top by the bobbin case race 15 so as to form a throat which houses the edge strip 16 of the bobbin case holder 17. The bobbin case holder is designed in the usual way with a centre pinion 18 inside on which a bobbin case (not illustrated) is slipped.

Race 15 carries two notched pins 19 and 20 to pass through holes 3 and 4 and fit into flange 5 where they are retained as described below.

Flange 5 has a diametral groove 21 on the side touching rotary unit 1.

This groove serves as a radial guide for the two slides 22 and 22' each of which has two slots 23 and 24.

Two studs 25 and 25' project from the bottom of groove 21 at the same distance each side of the centre of flange 5, and two helical springs 27 and 27' are located at each side of the centre, separated by block 26.

The two slides 22 and 22' fit in groove 21 with slots 23 engaged respectively on studs 25 and 25' so that oblong slots 24 register with holes 12 and 13.

Beneath flange 5, to which it is fixed by screw 8, is a pressure blade 28, the two tips of which are concave and aligned with holes 12 and 13.

The ends of notched pins 19 and 20 and the inner edge of slot 24 are shaped appropriately for retaining bobbin case race 15 on flange 5 (Figs. 4, 5, 6): pins 19 and 20 end with a notch *a*, while the inner edge of the slot slopes so as to form a tooth *b*. When pins 19 and 20 are pushed home through holes 3 and 4 of the rotary unit 1 and holes 12 and 13 of flange 5, teeth *b* of the slides 22 and 22' pushed against the outside of springs 27 and 27' are wedged in notches *a* on pins 19 and 20, thus retaining the bobbin case race in position against rotary unit 1. When it is desired to remove the bobbin case race 15 and hence the bobbin case holder 17 the edge 16 of which fits between 15 and rotary unit 1, pressure is brought to bear on the bent end of slides 22 and 22' in the direction of arrows *c* and *c'*, compressing springs 27 and 27' and disengaging retainer elements *a* and *b*; bobbin case race 15 can thus be easily slipped out by applying pressure on the two slides 22 and 22'.

This operation is further facilitated by the pressure blade 28 located beneath flange 5 which aids in ejecting bobbin case race 15; when the latter is to be removed, the two slides 22 and 22' are pressed and at the same time blade 28 presses its concave tips 29 and 29' against the tips of pins 19 and 20 released from teeth *b* until it touches the underside of flange 5; springs 27 and 27' release pressure from the slides and bear in the opposite direction to that shown by arrows *c* and *c'*, while the two teeth *b* of the two slides 22 and 22' bear wedge-wise against sloping surfaces *d* and *d'*, of pins 19 and 20, raising bobbin case race 15 further so that it can freely be removed together with the bobbin case container.

It is preferable for notch *a* to have a sloping lower edge, so that the radial pressure of tooth *b* on such edge, pursuant to the action of springs 27 and 27' in the opposite direction to arrows *c* and *c'*, develops an axial closing thrust in the direction of the arrow X (Fig. 6) and retains bobbin case race 15 against the rotary hook unit by pressure.

I claim:

1. For use in a sewing machine, in combination, a rotary hook having an open top and having a side wall extending at least partly about the axis of rotation of said rotary hook and formed with a pair of angularly spaced bores extending downwardly from the top face of said side wall substantially parallel to the axis of rotation of said rotary hook; a retaining ring engaging said top face of said rotary hook for cooperating with the latter to retain a bobbin case holder; a pair of pins respectively fixed to said ring and extending downwardly therefrom respectively into said bores of said rotary hook, so that said pins connect said ring to said hook for rotation therewith; releasable catch means formed in part by bottom free end portions of said pins and carried in part by said rotary hook for releasably retaining said ring against said top

face of said rotary hook; and spring means carried by said rotary hook and engaging at least one of said pins for urging said ring upwardly away from said top face of said rotary hook when said catch means is released.

2. For use in a sewing machine, in combination, a rotary hook having an open top and having a side wall extending at least partly about the axis of rotation of said rotary hook and formed with a pair of angularly spaced bores extending downwardly from the top face of said side wall substantially parallel to the axis of rotation of said rotary hook; a retaining ring engaging said top face of said rotary hook for cooperating with the latter to retain a bobbin case holder; a pair of pins respectively fixed to said ring and extending downwardly therefrom respectively into said bores of said rotary hook, so that said pins connect said ring to said hook for rotation therewith; and releasable catch means formed in part by bottom free end portions of said pins and carried in part by said rotary hook for releasably retaining said ring against said top face of said rotary hook, and for continually urging said ring downwardly against said top face of said hook; and urging means engaging at least one of said pins for urging said ring away from said top face of said hook when said catch means is released.

3. For use in a sewing machine, in combination, a rotary hook having an open top and a side wall extending at least partly about the axis of rotation of said hook, said side wall being formed with a pair of angularly spaced bores extending through said side wall in a direction substantially parallel to the axis of rotation of said rotary hook, said rotary hook further including a bottom wall having a top face formed with an elongated groove extending diametrally across said bottom wall, and the latter being formed with a pair of openings passing therethrough at the end portions of said groove, respectively, and respectively aligned with said bores; a pair of pins fixed to said bottom wall in said groove thereof and located between the axis of rotation of said hook and said bottom wall openings on opposite sides of said axis of rotation, respectively; a pair of catch members slidable in said groove toward and away from each other and

each formed with an elongated slot through which said pins respectively extend so that said pins limit the movement of said catch members in said groove, each of said catch members having a catch tooth directed away from the axis of rotation of said hook, said catch teeth of said catch members being respectively directed toward said openings of said bottom wall; a retaining ring engaging the top face of said side wall of said hook and cooperating with the latter for retaining a bobbin case holder, said retaining ring having a pair of catch pins respectively fixed thereto and extending downwardly therefrom through said bores and through said openings of said bottom wall, respectively, said catch pins respectively being formed with lateral notches directed toward the axis of rotation of said hook and located at the elevation of said catch teeth, respectively, when said ring engages said top face of said side wall, so that said catch teeth cooperate with said notches for retaining said ring in engagement with said hook; and spring means located in said groove between said catch members and engaging the latter for urging the same apart from each other and toward said catch pins so as to resiliently urge said catch teeth into said notches of said catch pins.

4. A structure as recited in claim 3 and wherein said catch pins respectively extend downwardly through and beyond said openings of said bottom wall when said retaining ring engages said top face of said hook and wherein a resilient means is fixed to said bottom wall and engages the bottom ends of said pins for urging the latter upwardly when said catch members are moved toward each other to release said pins and ring therewith.

References Cited in the file of this patent

UNITED STATES PATENTS

530,862	Teed	Dec. 11, 1894
1,981,834	Fleckenstein	Nov. 20, 1934
2,469,517	Petskeyes	May 10, 1949

FOREIGN PATENTS

493,748	Germany	Mar. 14, 1930
363,590	Italy	Oct. 8, 1938