Dec. 11, 1962 G. GUSTIN 3,067,703

COMBINATION ROTARY HOOK AND BOBBIN-HOLDING BASKET DEVICE FOR SEWING MACHINES

Filed Oct. 5, 1959 4 Sheets-Sheet 1

Fig. 1

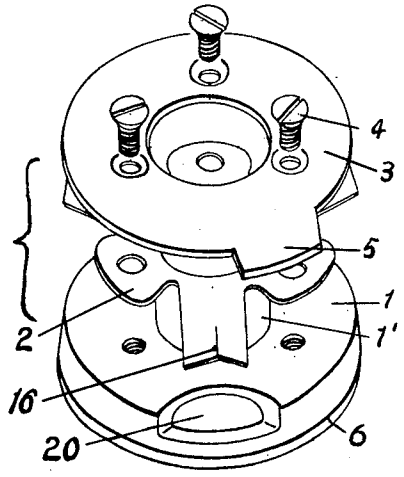
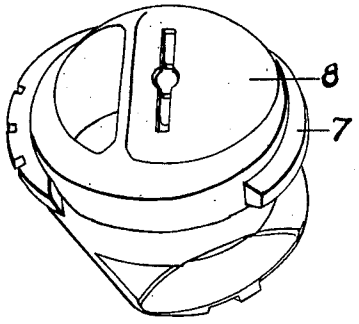


Fig. 2



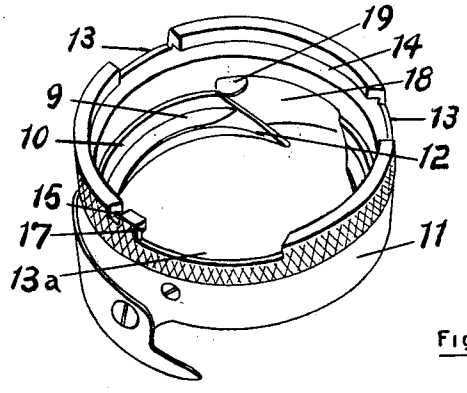


Fig. 3

Inventor

GIULIANO GUSTIN

By Irwin S. Thompson

Attorney

Dec. 11, 1962 G. GUSTIN 3,067,703

COMBINATION ROTARY HOOK AND BOBBIN-HOLDING BASKET DEVICE FOR SEWING MACHINES

Filed Oct. 5, 1959 4 Sheets-Sheet 2

Fig. 5

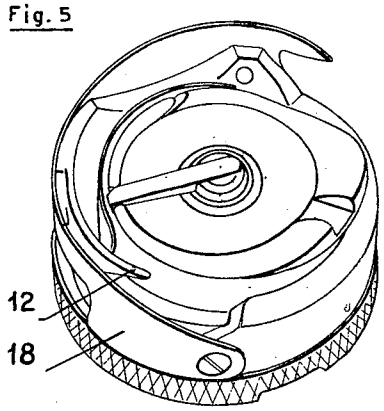
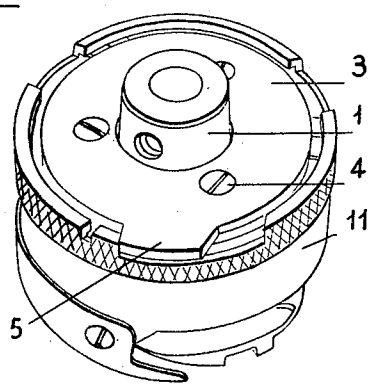


Fig. 6



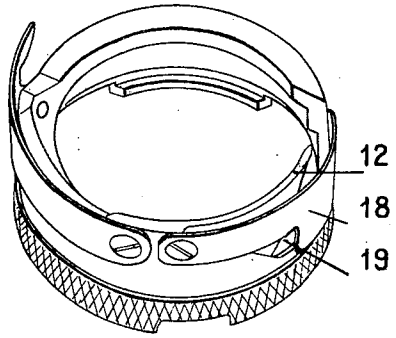


Fig. 4

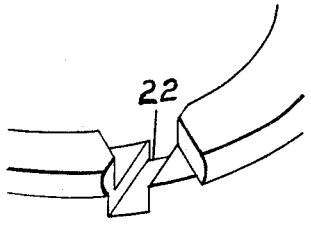
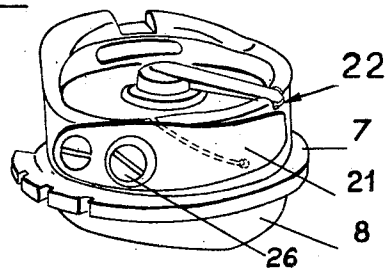


Fig. 8

Fig. 7



Inventor

GIULIANO GUSTIN

By Irwin S. Thompson

Attorney

Dec. 11, 1962 G. GUSTIN 3,067,703

COMBINATION ROTARY HOOK AND BOBBIN-HOLDING BASKET DEVICE FOR SEWING MACHINES

Filed Oct. 5, 1959 4 Sheets-Sheet 3

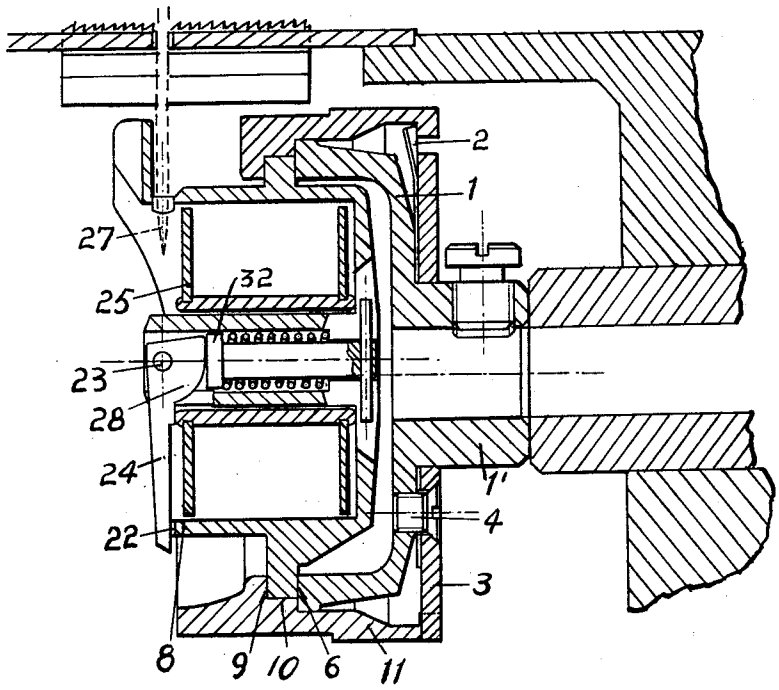


Fig. 9

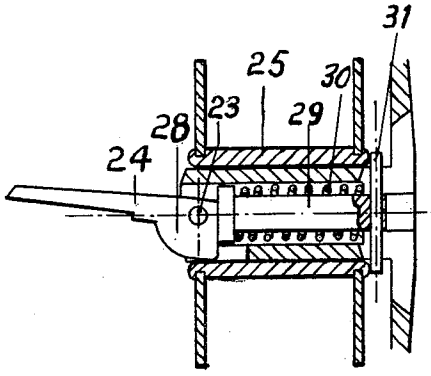


Fig. 10

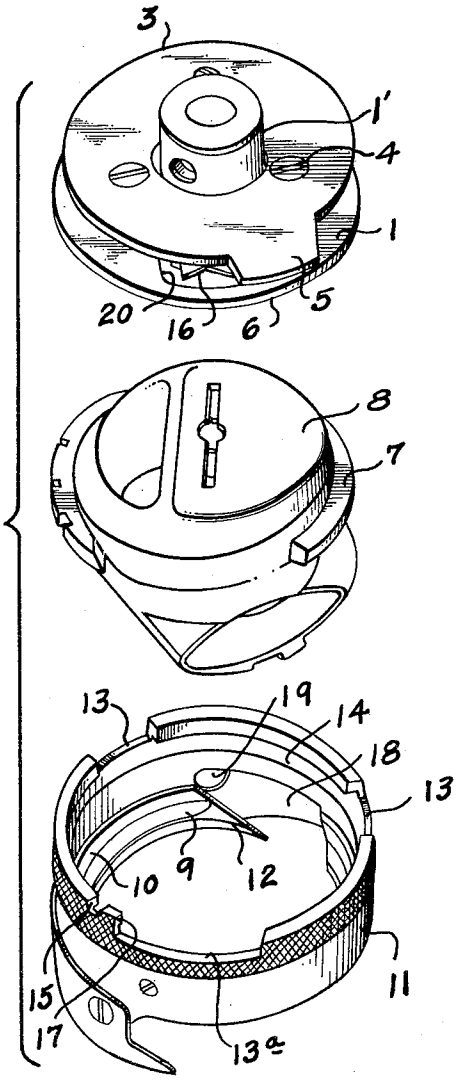
Inventor
GIULIANO GUSTIN
By Irwin S. Thompson
Attorney

Dec. 11, 1962 G. GUSTIN 3,067,703

COMBINATION ROTARY HOOK AND BOBBIN-HOLDING BASKET DEVICE FOR SEWING MACHINES

Filed Oct. 5, 1959 4 Sheets-Sheet 4

Fig. 11



INVENTOR.
GIULIANO GUSTIN
BY
Irwin S. Thompson
ATTORNEY

United States Patent Office 3,067,703 Patented Dec. 11, 1962

3,067,703

COMBINATION ROTARY HOOK AND BOBBIN-HOLDING BASKET DEVICE FOR SEWING MACHINES

Giuliano Gustin, Milan, Italy, assignor to S.p.A. Fratelli Borletti, Milan, Italy

Filed Oct. 5, 1959, Ser. No. 844,491
Claims priority, application Italy Nov. 5, 1958
8 Claims. (Cl. 112—230)

In sewing machines, and especially in those of domestic type, the usual construction of the rotary hook combined with a bobbin-carrying basket which is used to grip and tie the stitch is not adapted to ensure trouble-free operation. In fact, owing to the difficulty of removing and cleaning the hook which is presented when obstructions are formed in its sliding seat due to the penetration of waste or of pieces of thread, the hook renders the machine liable to sudden jamming owing to the effect of these obstructions, which results in considerable stresses. This makes it necessary to keep the machine idle until the assistance of a skilled person, who can remove the hook and replace it when cleaning has been carried out, is obtained.

This drawback does not arise, it is true, with hooks having a sliding seat open on one side, in which a fixed part of the hook is held in place by a member known as an eyepiece, but since this member, owing to functional requirements, must have a large clearance with the part retained in the seat, such hooks are not only noisy in operation, but can also oscillate in such a way as to impair the regularity of the seam.

The aim of the combination rotary hook and bobbin-holding basket device for sewing machines forming the subject of the present invention is to eliminate these drawbacks.

Said device is characterised in that a base, adapted to be fixed to the shaft, intended to rotate the hook of the machine, is connected by means of a bayonet connection to a closed ring which carries a hooked point at its periphery and forms the hook proper and within which is mounted the bobbin basket fixed, by means of a peripheral guide the projection thereon, between the edge of the base and a shoulder on the hook ring and adapted to retain the bobbin in it by means of a lever provided on said basket and lowerable on to the bobbin itself.

With this arrangement, complete dismantling of the device can be achieved, without the use of any tool, merely by rotating the hook ring manually, thus making it slide on the bayonet connection elements of the base so as to detach itself from the latter, and then extracting the bobbin-holding basket from the ring.

According to a further feature of the invention, the elements of the bayonet connection of the base to the hook ring are sprung.

An embodiment of the invention is illustrated in the accompanying drawings, in which:

FIG. 1 shows, in perspective view and separated from one another, the three parts which when connected together form the base,

FIG. 2 is a perspective view of the bobbin-holding basket,

FIG. 3 is a perspective view of the closed ring forming the hook,

FIG. 4 is a perspective view of the closed ring forming the hook shown inverted with respect to the view given in FIG. 3,

FIG. 5 is a perspective view of the assembled device,

FIG. 6 is a perspective view of the assembled device shown inverted with respect to the view given in FIG. 5,

FIG. 7 is a perspective view of the basket with the bobbin fitted therein,

FIG. 8 shows in perspective and on an enlarged scale a detailed of the notch of the basket through which the thread passes,

FIG. 9 is a longitudinal section of the device fully assembled and with the bobbin held in position by the retaining lever pivoted to the basket,

FIG. 10 shows the bobbin in the basket in longitudinal section, the basket being shown in part and with its retaining lever raised so as to free the bobbin, and

FIG. 11 is an exploded view similar to FIGS. 1 to 3 with the structure of FIG. 1 shown in an assembled position.

The part 1 of the base is provided with a hub 1' for fixing it to the hook-driving shaft of the machine and carries at the rear a flat spring 2 having two extensions and against which a plate 3 is applied which clamps the spring against the part 1, the plate 3 being connected to the part 1 and to the spring 2 by means of screws 4. The plate 3 is provided with a radial projection 5, apt to work as a stop-tooth.

The part 1 of the base forms with the outer surface 6 of its edge the inner abutment seat of the guide 7 of the bobbin-holding basket 8.

The other two seats on which the guide 7 slides, namely the axial abutment seat 9 and the radial abutment seat 10, form part of the hook proper 11 constituted by a ring carrying the aforesaid seats, the point 12 of the hook, and the zone of engagement with the base, this zone being formed by two apertures 13 permitting the introduction of the extensions of the spring 2, an aperture 13*a* for introducing the projection 5 of the plate 3, an annular groove 14 into which the aforesaid extensions of the spring 2 are introduced by drawing the ring resiliently against the base and a notch 15 in which is housed an indentation 16 of the spring 2, which in this way prevents the hook re-opening by itself once it has been closed.

The final position of the ring 11 on the base 1 is defined by the engagement of the projection 5 of the plate 3 against a face 17 formed by milling on the ring 11.

The engagement and the disengagement of the ring 11 are therefore carried out by rotating the ring on the base 1 by the amount permitted by movement of the stop tooth 5 of the plate 3 in the long recess 13*a* of the ring 11 and then effecting the introduction of the ring or the extraction thereof in the position in which the resilient extensions of the spring 2 are facing the notches 13 in the ring.

The device is fully assembled by first placing the bobbin-holding basket 8 in its seat in the ring 11 and then engaging the ring over the base 1, as has been said above.

A plate 18 for protecting the point 12 of the hook, for example in the event of the ring or the device being dropped, is fixed in bridge fashion over the milling of the ring 11 in correspondence with the point 12. This plate is open at 19, at the root of the point 12, so as to render it easy to remove the waste thread which is formed during sewing.

A similar aperture 20 is formed at the inner edge of the base 1 and this has the dual function of permitting better balancing and the ejection of dust. Owing to its special construction, the hook is completely balanced without resorting to special devices.

The basket 8 has a special arrangement of the tension spring 21 and the passage for the thread, which is held in position in the recess 22 by the tip of a lever 24 pivoted at 23, which lever retains the bobbin 25.

This arrangement allows adjustment of the tension spring 21 to be effected, by means of its screw 26, with a screw-driver applied to the lower part of the hook, a particularly convenient position whatever the use of the hook on the various possible types of sewing machine. Moreover, the passage for the thread located under the end of

the tip of the lever 24 which retains the bobbin and renders the insertion of the hook easy, since the thread tends, owing to its natural setting, to dispose itself in the correct position.

The hook is formed in such a way as to contain a bobbin 25 identical to those ordinarily employed in shuttle for machines of domestic type and carrying a quantity of thread distinctly greater than that carried by conventional rotary hooks.

Moreover, the needle 27 penetrates the hook outside the bobbin in such a manner that the point of the needle never brushes or damages the thread wound on the bobbin.

As has already been said, the member securing the bobbin is constituted by a locking lever 24 carrying a cam 28 adapted to act on the head or end of a small plunger 29, which is urged in the opposite direction against the lever 24 by a spring 30. The plunger 29 carries at its lower part a crosspiece 31 and at its upper part a head 32, so that by moving the lever 24 and releasing the bobbin 25 the latter is pushed and ejected by the cross-piece 31 connected to the plunger 29. Such an arrangement makes it particularly easy to extract the bobbin.

The device formed in the manner described offers the following advantages in use:

The possibility of removing the hook and the basket from the machine without using any tool, so that said elements can be carefully cleaned, or replaced if required, and re-mounted on the machine with every ease.

The possibility of keeping the base only fixed to the machine, which base can easily be cleaned without taking it apart, which enables the adjustment of the whole unit to be preserved unchanged when the hook and the basket are replaced after being removed from the machine.

A resilient yielding action of the connections of the various elements of the unit when foreign bodies penetrate between said elements in movements, owing to the presence of the spring extensions carried by the base, which, in the case of the obstructions in question, permit relative displacement of the base in the hook ring and with respect to the basket.

If, moreover, it is desired to consider the construction conditions of the device, it is worth observing that the construction of the hook is facilitated by the fact that its closed ring form obviates hardening deformations.

What I claim is:

1. A rotary hook device for sewing machines, comprising a hook-rotating shaft, a base having an edge and adapted to be mounted on the hook-rotating shaft, a hook-carrying ring having a shoulder and mountable onto said base, connecting means consisting of a bayonet connection for connecting said hook-carrying ring to said base, and a bobbin-holding basket to hold a bobbin therein, said basket arranged within the hook-carrying ring between said edge of the base and said shoulder of the hook-carrying ring.

2. A rotary hook device according to claim 1, in which said connecting means has spring means to provide a spring biased bayonet connection for connecting said hook-carrying ring to said base.

3. A rotary hook device according to claim 2 in which said spring means consists of a flat spring having extensions depending outwardly therefrom and being connected to said base, a groove disposed in said hook-carrying ring for receiving said extensions upon rotation of said hook-carrying ring when being connected to said base.

4. A rotary hook device according to claim 3 in which a plate having a radial projection is mounted on said base, a notch disposed in said hook-carrying ring to receive said radial projection and form a stop to arrange said extensions of said flat spring in the correct position in said groove to form the bayonet connection between said base and hook-carrying ring.

5. A rotary hook device according to claim 1 in which said hook-carrying ring has a hook containing a point mounted thereon, a protection plate mounted on said hook-carrying ring over said hook and point thereof to protect said point, said protection plate having an opening disposed at the root of said point.

6. A rotary hook device according to claim 5 in which an aperture is disposed in said hook-carrying ring in communication with said opening of said protection plate to permit easy removal of waste thread.

7. A rotary hook device according to claim 1 in which said bobbin-holding basket has one end of a lever pivotally mounted thereto to retain a bobbin within said bobbin-holding basket, a notch disposed in the top edge of said bobbin-holding basket for the passage of thread therein, the other end of said lever being disposed in said notch to retain the thread therein.

8. A rotary hook device according to claim 7 in which a plunger having a crosspiece mounted at one end is arranged in the center of said bobbin-holding basket, a head disposed at the other end of said plunger, a spring member arranged between said cross piece and head, said one end of said lever has a cam portion which moves said plunger within said bobbin-holding basket against the bias of said spring member when said lever is in bobbin retaining position, said crosspiece ejecting said bobbin from said bobbin-holding basket when said lever is moved from a bobbin retaining position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,096,369	Hohmann	May 12, 1914
1,188,818	Parkes	June 27, 1916
1,612,647	Plumly	Dec. 28, 1927
2,548,815	Petskeyes	Apr. 10, 1951
2,869,495	Bono	Jan. 20, 1959

FOREIGN PATENTS

281,418	Great Britain	Dec. 8, 1927
1,193,578	France	Apr. 27, 1959