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BOBBIN CASE HOLDER FOR SEWING MACHINES

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FIG. 1

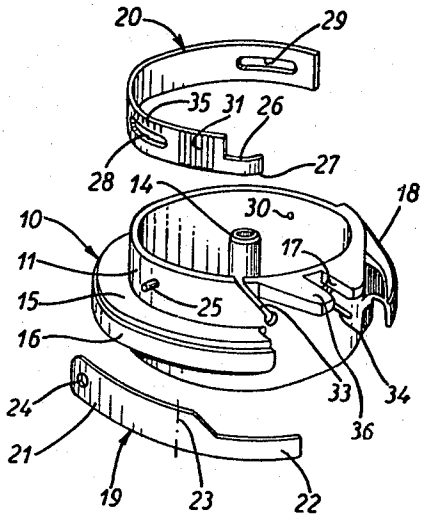
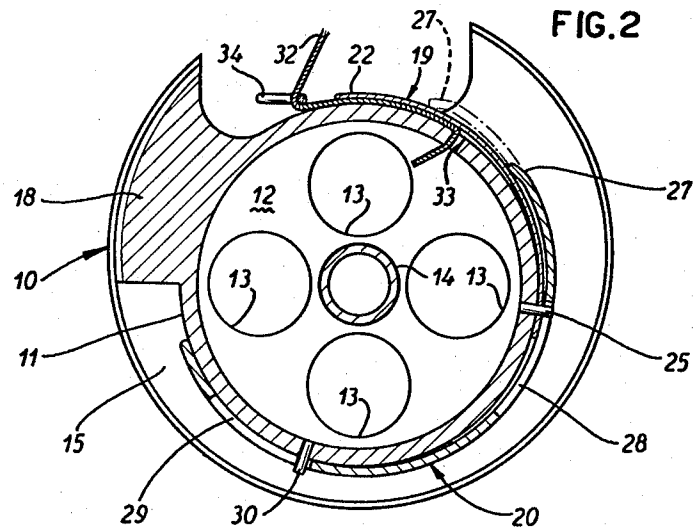


FIG. 2



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BOBBIN CASE HOLDER FOR SEWING MACHINES

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ABSTRACT OF THE DISCLOSURE

A bobbin case holder for sewing machines comprising an improved tensioning device for the lower thread, said device comprising an arcuate clamping member of varying radius fitted along the external cylindrical wall of the bobbin holder for clamping the lower thread against said wall, and a resiliently flexible arcuate leaf spring fitted on said wall over said clamping member, said leaf spring being circumferentially displaceable along the extent of said clamping member.

The present invention relates to an improved bobbin case holder for lock-stitching sewing machines, the improvement residing in that said holder is provided with an improved means to adjustably tension the thread which is drawn from said holder. Specifically, the thread whose tension is adjusted is the lower thread of the sewing machine.

Adjustable tensioning holders are already known wherein the thread tension adjustment is realized through a very gradual variation and wherein the degree of tension is variable is measured amounts. These known holders are distinct from still earlier devices which employed a pressure spring and an elastic lamination which was placed on the external cylindrical wall of the bobbin case.

A major object of this invention is to provide a tension adjustable holder device which constitutes an improvement over the heretofore known devices as regards simplicity of construction, efficiency in operation, low cost, and reduction in size of the essential elements.

The above and other objects of this invention will become readily apparent from the following detailed description of a preferred embodiment, which description is referred to the appended drawing, in which:

FIGURE 1 is an enlarged perspective view of the bobbin case holder with the tension regulating elements detached from the holder body; and,

FIGURE 2 is a top plan sectional view showing all the elements in assembled condition.

The bobbin case holder is denoted **10** and is adapted to be applied to a hook (not shown) of the type having an open race. The holder **10** is comprised of a cylindrical wall **11** which is closed at one end by a bottom wall **12** which, in turn, is provided with circular openings **13**. A hollow pin **14** extends upwardly and rigidly from the bottom **12** coaxially with the wall **11** and substantially for the full height of said wall. Pin **14** is adapted to have the thread bobbin (not shown) mounted thereon in a known manner within the chamber defined by wall **11**.

Along the outer surface of wall **11** and intermediate its ends there is provided a guide ring **15**, said ring having the shape of a cylindrical crown and being interrupted for a circumferential portion thereof, in accordance with known practice, and said ring having an axis which is eccentric relative to the axis of pin **14**, but which is coincident with the axis of the sewing machine hook carrying shaft.

The guide ring **15** is provided on its lower surface with a crown **16** of plastic material which is for the purpose of reducing friction between the ring **15** and the race of the hook.

On the portion of wall **11** which extends above ring **15** there is provided a U-shaped recess **17** in a flange **36** which extends radially from a portion of the upper end of wall **11**. The recess **17** is located in vertical alignment above the circumferential interruption in ring **15**, and said recess is adapted to engage a fixed fastening means on the sewing machine in order to fix the position of the bobbin case holder **10** relative to said machine.

In the vicinity of recess **17** a short circumferential portion of the upper end of wall **11** is joined to ring **15** by means of a projection **18** which is provided so as to facilitate the conveyance of the stretch of loop of the upper thread which laps the upper part of the bobbin case holder and of the bobbin.

The lower thread tensioning means comprises a resilient leaf element **19** and a tension regulating ring segment **20**. The leaf element **19** has an overall arcuate contour and is constituted by two coextensive arms **21** and **22** each of which conforms to an arcuate contour of different radius, said arcuate contours meeting along axis **23**. The radius of curvature of arm **21** conforms to that of wall **11** so that arm **21** fits flush against the outer surface of wall **11**. Arm **22**, on the other hand, has a smaller radius of curvature than arm **21**, and further, its center of curvature does not coincide with the axis of wall **11**, so that, when element **19** is assembled on holder **10**, arm **22** remains detached from wall **11** to a progressively increasing extent as the distance from axis **23** increases. As is seen in FIGURE 2, arm **22** constitutes a thread contact portion of element **19**.

Leaf element **19** is provided with a hole **24** at one end of arm **21**. This hole fits closely around pin **25** which fixedly extends from wall **11** and this engagement prevents any circumferential shifting of element **19** relative to holder **10**.

The outer end of arm **22** is reduced in height relative to the remainder of the element **19** so as to compensate for the thickness of flange **36** and to thereby avoid interference therewith when element **19** is assembled on the holder **10**.

The tension regulating ring segment **20** is constituted by a band of material wihch is bent along a circular arc and defines an arcuate extent of substantially greater than 180 degrees. The radius of the inner surface of ring segment **20** is equal to the radius of curvature of the outer surface of wall **11**.

Ring segment **20** includes an end portion **26** whose height or vertical width is reduced relative to the height of the remainder of the ring segment by an amount to permit portion **26** to fit against wall **11** without being obstructed by flange **36**. The terminal portion **27** of ring portion **26** is radially inwardly bent as is most clearly seen in FIGURE 2.

Ring segment **20** includes two identical elongate guide slots **28** and **29** through which extend, respectively, the pins or stud elements **25** and **30** when the member **20** is assembled on the holder **10**. Pins **25** and **30** are both rigidly fixed on wall **11** and extend generally radially therefrom. Ring segment **20** is, therefore, circumferentially slidable relative to wall **11** to an extent equal to the arcuate length of the slots **28** and **29**. Ring segment **20** is provided with a roughened outer surface such as knurling at **31** in order to facilitate gripping by a person for the purpose of circumferentially shifting segment **20** relative to holder **10**.

With specific reference to FIGURE 2 wherein all the parts are shown in assembled condition, it is seen that resilient leaf **19** is fitted against wall **11** with pin **25** extending through hole **24** and that ring segment **20** is fitted with a portion thereof over resilient leaf **19** and

with pins **25** and **30** extending through slots **28** and **29**. Since ring segment **20** extends around wall **11** for an arcuate extent of greater than 180 degrees and since its terminal portion **27** is inwardly bent, it securely grips itself onto the cylindrical wall **11** while undergoing a slight outward elastic deformation or arching in the region adjacent to terminal portion **27**, and said terminal portion **27** thereby resiliently presses inwardly against the arm **22** of leaf **19**.

The thread **32** of the bobbin is led from the interior of the bobbin case holder **10**, through slot **33** in said holder wall **11**, and then circumferentially between the outer surface of wall **11** and the inner surface of arm **22** of leaf **19**, and finally the thread is engaged with the thread guiding hook **34**. It is seen, therefore, that a braking force is exerted on thread **32** by its being pressed between arm **22** and wall **11**. By circumferentially shifting ring member **20** relative to wall **11**, terminal portion **27** is made to press inwardly against different locations on arm **22** and thereby the amount of braking force or tension against the thread is varied in accordance with the location of terminal portion **27** relative to arm **22**.

In order to establish determinable tension settings for the thread, pin **25** may be used as an index point and reference markings **35** may be provided on ring member **20** above slot **28** so that by aligning respective ones of said markings with pin **25** the tension on the thread can be varied according to fixed settings.

It is, therefore, seen from the above that a simple, efficient, and economical adjustable tensioning means is provided for adjusting the tension in lower thread **32**.

It is to be understood that the above described specific embodiment represents only one possible realization of the present inventive concept and that all obvious modifications thereof are intended to be within the scope of the following claim.

What is claimed is:

1. A bobbin case holder for a sewing machine, comprising a cylindrical wall adapted to receive a thread bobbin therein, said wall having a radial opening for the passage of thread therethrough, an adjustable thread tensioning means comprising a resilient leaf element extending along the outer side of said wall, a portion of said leaf element extending along an arc of smaller radius than that of said wall whereby said leaf element is spaced from said wall along the arcuate extent between the ends of said leaf element portion, said tensioning means further comprising a band of resilient material circumferentially embracing said wall along an arcuate extent thereof exceeding 180°, one end of said band radially overlapping said leaf element portion, said one end of said band being inwardly bent relative to the remainder of the arcuate extent of said band to form a bent-in end which radially bears against said leaf element portion, said band contacting said leaf element portion substantially only in the region of said bent-in end and being radially spaced from said leaf element portion along the remaining arcuate extent of radial overlap between said leaf element and said band, said band being circumferentially displaceable along said wall to thereby vary the point at which said bent-in end bears against said leaf element portion, wherein said leaf element comprises first and second arcuately coextensive portions, said first portion being of the same radius as said wall and lying flush thereagainst and said second portion being said arc of smaller radius than said wall, said bent-in portion of said band adjusting the tension of the thread as said bent-in portion is moved over said arc of said leaf element.

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