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BOBBIN FOR LOCKSTITCH SEWING MACHINES

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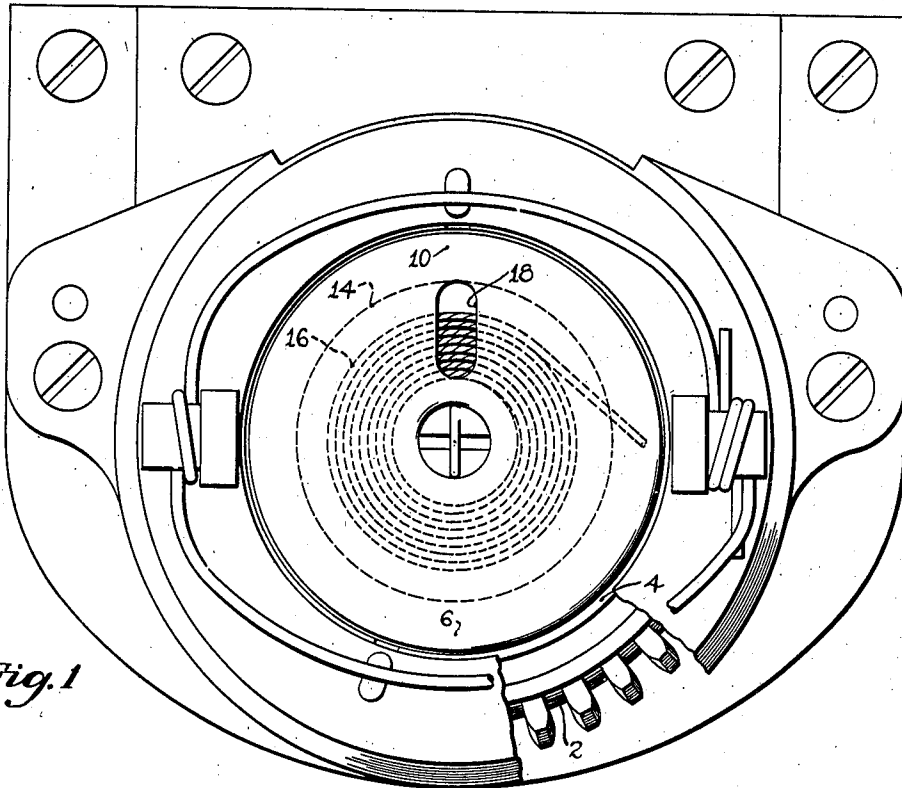


Fig. 1

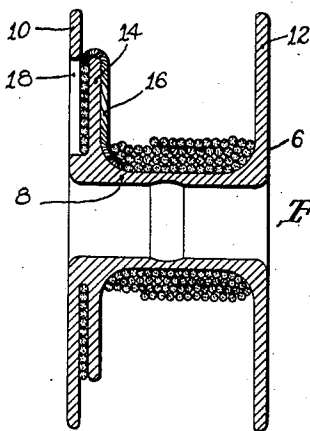


Fig. 2

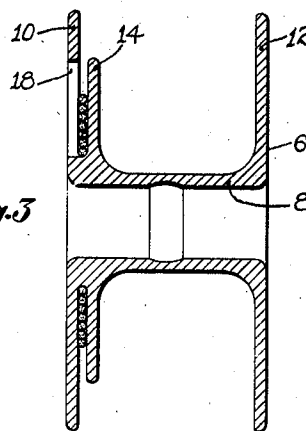


Fig. 3

Witness

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UNITED STATES PATENT OFFICE

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BOBBIN FOR LOCKSTITCH SEWING
MACHINES

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7 Claims. (Cl. 112—251)

The present invention relates to lockstitch sewing machines and more particularly to locking thread supply holding bobbins arranged to render possible an accurate indication of approaching exhaustion in locking thread during operation of a machine of the type disclosed in U. S. Letters Patent to the present inventor No. 1,169,909 of February 1, 1916, and an application for patent Serial No. 263,455, filed March 22, 1939, by the present inventor and Whitaker, as joint inventors from which has matured Patent No. 2,271,611, granted February 3, 1942.

In the machine of the application referred to, the supply of locking thread is supported within a hollow rotary loop taker in a bobbin having as a supply holder, a reel of ordinary form with a hub and side flanges between which the thread is wound. To enable the operator to inspect the supply of thread in the bobbin during operation of the machine, the side flanges of the reel are provided with sight openings which are uncovered as the locking thread is consumed by the sewing operations. The distance between the flanges on the reel is many times the diameter of the thread so that a rough estimate only of the amount of thread remaining in the bobbin can be made from an inspection of the supply through the sight openings. If the thread is wound on the hub of the reel in an irregular manner with a substantial amount bunched at one end, then it is difficult, if not impossible, to determine the amount of thread remaining by an inspection through the sight openings of the single flange exposed outside the interior of the shuttle, the thread wound on the hub adjacent the outermost flange of the reel only being visible.

The objects of the present invention are to provide a bobbin for a lockstitch sewing machine in which an accurate determination may be made of the amount of continuous thread regardless of how the main bulk of thread is applied to the bobbin and in which consumption of thread to a length below that by which a complete seam may be sewed is readily detectable.

With these and other objects in view, a feature of the invention contemplates the use of a bobbin in a lockstitch sewing machine comprising a reel having a hub, side flanges at least one of which is formed to enable inspection and means on the hub for holding a wound auxiliary length of thread adjacent the inspection flange, which length is sufficient in amount to complete the sewing of a seam, the auxiliary length being

clearly visible to the operator either through a sight opening in the inspection flange of the reel or by the use of transparent material such as synthetic resin in forming the inspection flange only or the reel in its entirety. As illustrated, the auxiliary length holding means is in the form of a central flange extending from the hub for supporting the length connecting the first end of thread applied to the reel during winding, separate from the main bulk of thread. When the thread is applied to a reel of this construction, the appearance of the bobbin will remain unchanged until the main bulk of thread is used up, at which time the thread of the auxiliary length will be reduced rapidly, giving a clear and exact indication of approaching exhaustion. Preferably the central flange is spaced from one of the side flanges by approximately the diameter of thread wound on the reel so that a single width winding only is present in the auxiliary length. As a result, the exposed side of the thread in the auxiliary length changes rapidly in appearance after the thread in the main bulk contained on the bobbin is used up.

These and other features of the invention and the advantages to be obtained thereby consist in the constructions, combinations and arrangements of parts hereinafter described.

Referring to the accompanying drawing which illustrate so much of the machine disclosed in the above-identified patent and application as is necessary for an understanding of the invention, Fig. 1 is a view in elevation, partly broken away, illustrating a shuttle, locking thread case and supply bobbin of a lockstitch shoe sewing machine constructed according to the features of the present invention; Fig. 2 is a sectional view taken along the diameter of the bobbin shown in Fig. 1, indicating the condition of the auxiliary length of thread in the bobbin before the main bulk of thread is exhausted; and Fig. 3 is a similar view of the bobbin indicating the condition after the main bulk of thread has been exhausted.

The machine of the patent and application is a lock-stitch outsole shoe sewing machine employing wax threads and having a curved hook needle for carrying loops of needle thread through the work and presenting them to a loop taker in the form of a cup-shaped rotary shuttle similar to that indicated at 2 in Fig. 1 of the present drawing. Within the hollow of the shuttle is mounted a circular locking thread case 4 for rotatably supporting a locking thread supply bobbin. The bobbin has a reel 6 formed with a central sleeve-

like hub portion joined at its ends to parallel flanges having sight openings through which the approximate amount of locking thread on the hub may be determined by inspection during sewing operations. The provision of sight openings in the flanges of the reel has a tendency to weaken the construction, so that when thread is wound under a heavy tension or an increase in moisture content of the thread occurs after being wound on the bobbin, the flanges may become cracked or distorted sufficiently to render their use troublesome as a result of increasing pressure of thread. To avoid reduction in strength of the flanges from the use of sight openings, it has been the practice to reduce the size of the openings to a point where minimum visibility results or to employ in the construction of the reel a material such as transparent or translucent synthetic resin, at least in the side flanges. A bobbin reel composed of transparent synthetic resin is disclosed in a co-pending application Serial No. 412,767 filed of even date herewith, by O. R. Haas. With any type of construction or materials employed, it is difficult, if not impossible, to determine exactly, while the machine is running, whether sufficient thread remains wound in the bobbin of the machine of the patent and application to complete sewing the entire seam of a shoe being operated upon.

To enable the operator to determine with certainty whenever there is insufficient locking thread remaining in the bobbin in the sewing machine of the present invention after the main bulk of thread has been used up, the reel 6 of the bobbin illustrated more particularly in Figs. 2 and 3, in addition to having a hub portion 8 and side flanges 10 and 12, is provided with an intermediate flange 14 spaced from the flange 10 by approximately the diameter of the locking thread indicated at 16 wound on the hub. Thus, the intermediate flange 14 holds an auxiliary single-width wound length of continuous thread close to the flange 10 and separate from the main bulk of thread on the bobbin. If the auxiliary length includes the first end of thread applied to the reel, it will be the last portion of the thread to become unwound after the main bulk is used up. The intermediate flange 14 has a smaller diameter than the side flanges but sufficiently large to hold an amount of thread which will complete the outseam of a single shoe so that after the main bulk of thread is used up, the auxiliary length will enable the operator to sew at least one more shoe. If the auxiliary length is reduced during the sewing of any outseam, then the operator will know by inspection of the auxiliary length that insufficient thread remains in the bobbin. Thus, an accurate determination of approaching exhaustion of thread in the bobbin is obtainable.

In order to render the auxiliary length of thread held separate from the main bulk by the flange 14 clearly visible to the operator, the flange 10 is formed to enable easy inspection of the thread adjacent thereto and is provided with a sight opening 18 extending the full radius of the flange 14 from the hub 8 to a point substantially opposite the outer edge of the flange 14. When the flange 14 is without perforation or sight opening, it retains its full structural strength to resist pressures set up between the flanges of the reel during winding or to withstand expansion of thread due to increasing moisture content. In place of the sight opening 18 in the inspection flange 10, the entire reel may be composed of

transparent synthetic resin as in the reel of the application of Haas above identified.

The nature and scope of the present invention having been indicated and a construction embodying the several features of the invention having been specifically described, what is claimed is:

1. A bobbin for a sewing machine comprising a reel having a hub, side flanges at least one of which is formed to enable easy inspection of successive turns in the adjacent thread on the reel, and means on said hub for holding separate from the main bulk of thread on the reel a wound auxiliary continuous length adjacent the inspection flange.

2. A bobbin for a sewing machine comprising a reel having a hub, side flanges, at least one of which is formed to enable easy inspection of successive turns in the adjacent thread on the reel, and means on said hub for holding a wound auxiliary continuous length at the first end of thread applied to the reel separate from the main bulk of thread supported by the reel when the supply is full to enable detection through the inspection flange of thread exhaustion on the reel below the auxiliary length.

3. A bobbin for a sewing machine comprising a reel having a hub, side flanges, at least one of which is formed to enable easy inspection of successive turns in the adjacent thread on the reel, and an intermediate flange extending from the hub between the side flanges for supporting an auxiliary continuous length at the first end of thread applied to the reel during winding separate from the main bulk of thread supported by the reel when the supply is full to enable detection through the inspection flange of thread exhaustion on the reel below the auxiliary length.

4. A bobbin for a sewing machine comprising a reel having a hub, side flanges, and an intermediate flange extending from the hub between the side flanges for supporting an auxiliary continuous length at the first end of thread applied to the reel during winding, separate from the main bulk of thread supported by the reel when the supply is full, one of said side flanges adjacent the auxiliary length of thread having a sight opening to render a condition of approaching thread exhaustion below the auxiliary length readily detectable.

5. A bobbin for a sewing machine comprising a reel having a hub, side flanges, at least one of which is formed to enable easy inspection of successive turns in the adjacent thread on the reel, and an intermediate flange on the hub spaced from the inspection flange by approximately the diameter of thread on the reel for holding separate from the main bulk of thread supported by the reel a single width continuous auxiliary length at the first end of thread applied to the reel when the supply is full to enable detection through the inspection flange of thread exhaustion on the reel below the auxiliary length.

6. A bobbin for a sewing machine comprising a reel having a hub, side flanges, and an intermediate flange of smaller diameter than the side flanges extending from the hub between the side flanges for supporting an auxiliary length at the first end of thread applied to the reel during winding, separate from the main bulk of thread supported by the reel when the supply is full, one of said side flanges adjacent the auxiliary length of thread having a sight opening extending from the hub substantially to a point opposite the edge of the intermediate flange to cause unwinding of

thread from the auxiliary supply to be immediately visible.

7. A bobbin for a sewing machine comprising a reel having a hub, side flanges, at least one of which is formed of transparent synthetic resin, and an intermediate flange on the hub spaced from the transparent flange for supporting an

auxiliary length at the first end of thread applied to the reel separate from the main bulk of thread supported by the reel when the supply is full to enable detection through the transparent flange of approaching thread exhaustion below the auxiliary length.

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