Oct. 21, 1952 W. V. GOODHUE 2,614,771

BOBBIN WITH STRAND END ATTACHING MEANS

Filed Feb. 14, 1949 2 SHEETS—SHEET 1

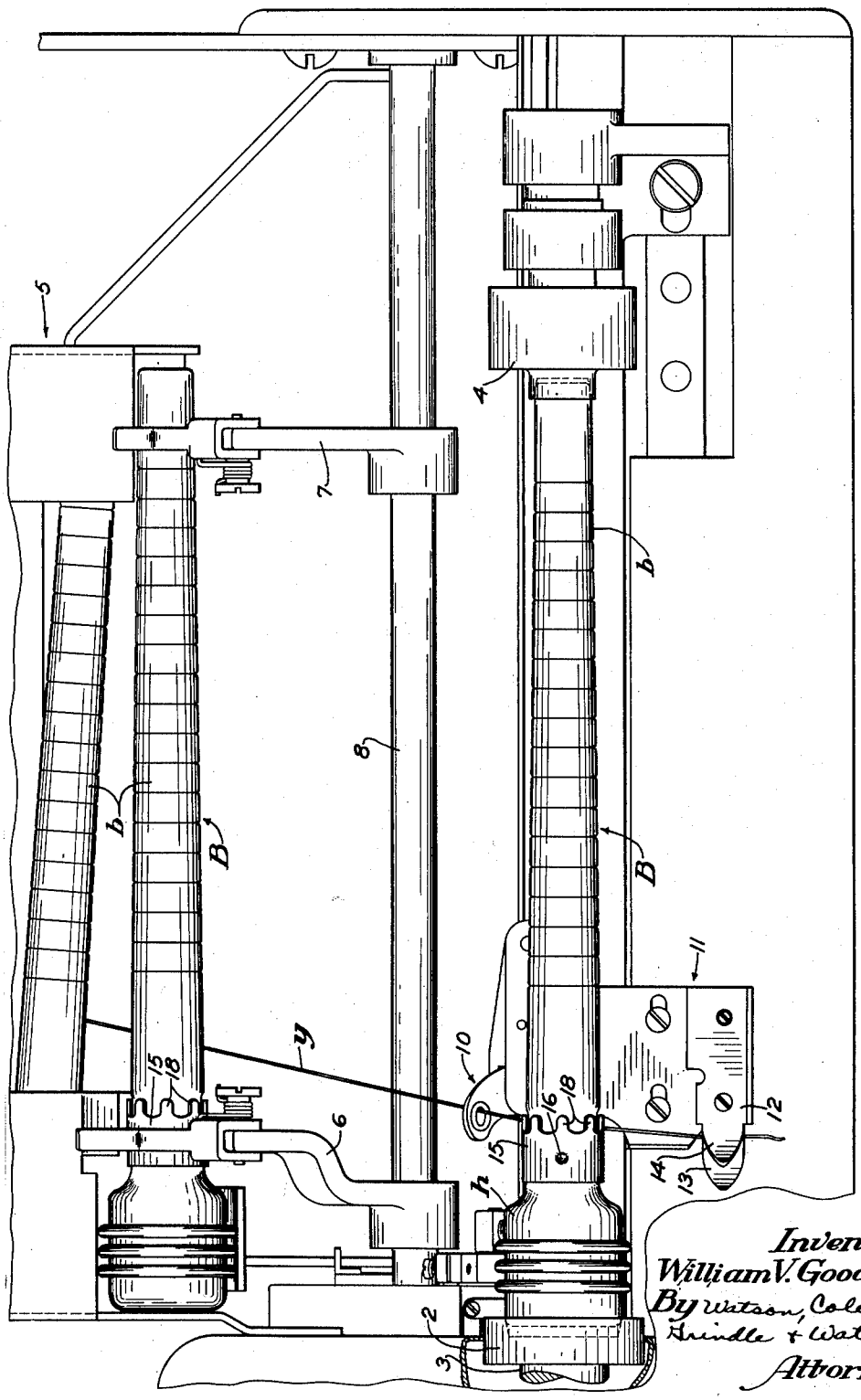



Fig. 1.

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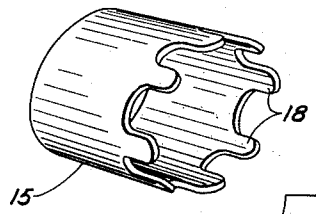



Fig. 5.

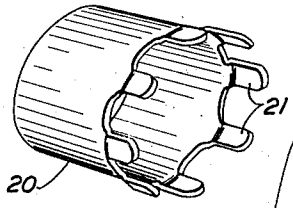



Fig. 6.



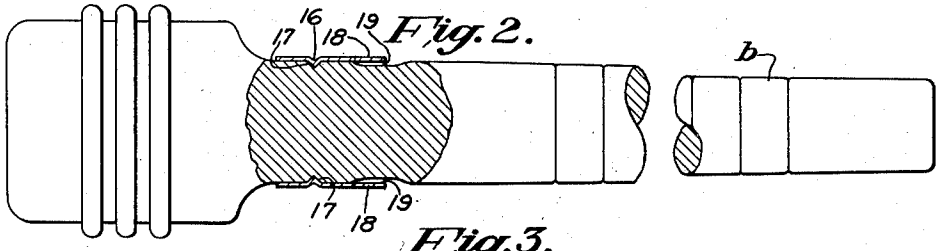




Fig. 2.

Fig. 3.

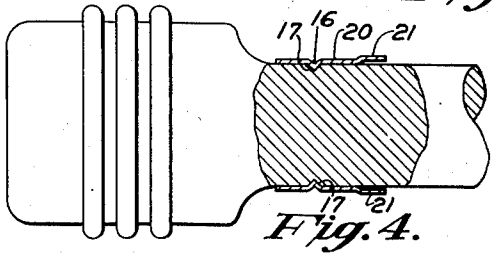



Fig. 4.

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# UNITED STATES PATENT OFFICE

2,614,771

## BOBBIN WITH STRAND END ATTACHING MEANS

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1 Claim. (Cl. 242—125)

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This invention relates to textile bobbins and other package cores for carrying or containing yarn and like filamentary materials and particularly to improved means for attaching the end of the yarn to the bobbin or core to provide for winding it thereon.

In the present specification and claim the term "bobbin" is used in a general sense to apply to any type of package core, yarn-carrier or container whatever its shape and the term "yarn" is employed to indicate all varieties of strand material.

As herein shown and described the improvements are applied to a conventional type of filling bobbin for use in the shuttles of looms, but it is to be understood that it may be used with other forms of bobbins and yarn-carriers such as spools, tubes, pirns and the like.

One object of the invention is to provide means on the barrel of the bobbin or spool for catching and holding the end of a strand of yarn to attach it thereto prior to winding it thereon.

Another object is to provide a device of the type specified which is particularly adapted for use with bobbins wound on automatic winding machines wherein the bobbins are doffed upon completion of the winding and fresh wooden bobbins donned on the winding spindles to effect continuous operation of the machine without manual manipulation.

Another object is to provide means on the barrel of the bobbin or spool having a prong or prongs under which the yarn strand may be drawn and held so that when rotation of the bobbin is commenced the yarn will wind thereon.

Another object is to provide a tubular sleeve or ferrule fixedly secured to the barrel of the bobbin and having prongs or fingers projecting therefrom in spaced relation to the barrel with which the end of the strand may be engaged and retained to fasten the yarn to the bobbin.

Further objects of the invention are set forth in the following specification which describes a preferred form of construction of the device, by way of example, with one modified form thereof, as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a side elevational view of a portion of an automatic bobbin winder showing the present invention applied to the wooden bobbins used in such machines and the manner of its operation during attachment of the end of the yarn to a bobbin;

Fig. 2 is an end elevational view of a portion of the machine shown in Fig. 1, illustrating the

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manner in which the strand is drawn into place beneath the prongs on the attaching device to fasten its end to the bobbin;

Fig. 3 is an enlarged view of a conventional type of wooden bobbin with its barrel shown partly in section to illustrate the present attaching device as applied thereto;

Fig. 4 is a similar enlarged view showing a modified form of attaching means;

Fig. 5 is a perspective view of the attaching means or ferrule shown in Fig. 3; and

Fig. 6 is a similar perspective view showing the ferrule in the form illustrated in Fig. 4.

In automatic bobbin winding machines of different types in use today the bare bobbins are fed to the winding mechanism and donned in connection with the winding spindles, usually between two axially-alined centers, and the yarn is attached to the bobbin by pinching it between the end of the bobbin and the hollow or cupped spindle-center which rotates the bobbin to wind the yarn thereon. Considerable difficulty has been experienced in securing the end of the yarn fast with the bobbin by means such as above described. Unless the yarn is placed accurately across the end of the cupped center of the winding spindle and held thereagainst under tension, when the bobbin is donned the yarn will not be fastened securely to the bobbin and cannot be wound thereon. Likewise, unless the end of the strand is held under considerable friction between the hollow cup on the winding spindle and the end of the bobbin it will pull out and consequently be released so that the winding operation cannot proceed.

To overcome the deficiencies of previous methods of attaching the end of a strand of yarn, thread or the like to a bobbin or other core to start winding it thereon the present invention provides means for positively gripping the yarn to the barrel of the bobbin to effect a secure connection of the strand therewith. While the invention is particularly adapted for use with automatic winding machines it may also be employed with other types of winders, for example, machines in which the end of the yarn is fastened manually to the barrel of the bobbin.

Fig. 1 of the drawings illustrates the essential parts of a bobbin winding machine embodying automatically-operated means for donning bare wooden bobbins in connection with the winding spindle thereof and attaching the end of the yarn to the barrel of the bobbin to start winding it thereon. In a machine of this type the bobbin B is usually supported and held between a hol-

low center or driver 2 at the end of the rotating winding spindle 3 and an axially-alined freely rotatable spindle-center 4; the driver 2 usually having a concavity or being cupped to receive the butt end or head *h* of the bobbin and the opposite spindle-center 4 also having a concaved recess for holding the tip end of the barrel *b* of the bobbin. Located above the winding spindle is a magazine 5 for containing a supply of bare bobbins B and means are provided, not herein shown, for doffing the wound bobbin by releasing it from the winding spindle centers, whereafter a fresh bobbin is carried down into position for donning it by connecting it to the winding spindle. The donning means may comprise a pair of arms 6 and 7 having gripping means for holding the bobbin B at its ends and carrying it down into alinement with the winding spindle centers 2 and 4 as the arms are rocked by rotating the rod or shaft 8 on which they are mounted. The strand of yarn *y* is traversed lengthwise of the barrel *b* of the bobbin B by a thread-guide 10 reciprocated from a cam or other suitable means, not herein shown, and means are provided for advancing the guide longitudinally of the bobbin to distribute the yarn in layers of relatively short extent to build the bobbin with a cylindrical periphery and tapered outer end. A machine of this type is illustrated and described in United States Letters Patent No. 2,302,715 of November 24, 1942, and its method of operation is well understood by those versed in the winding art.

As the winding of the bobbin is completed the thread-guide 10 will have been fed to the outer end of the wooden bobbin B and the finished bobbin is then doffed by releasing it from the spindle-centers 2 and 4 to drop it into a chute or other suitable means for collecting the bobbins prior to their transfer to a loom or other machine. After the wound bobbin has been doffed the thread-guide 10 is carried back toward the spindle-center 2 to start winding a new bobbin and a yarn-retriever 11 may be employed for cooperation with the thread-guide to return the strand of yarn into position for attaching it to a fresh bobbin after the latter has been donned in connection with the winding spindle. In the form of construction of the machine herein illustrated the thread-retriever 11 may be constituted as a slidable element having a clip 12 for seizing the yarn leading from the thread-guide 10 downwardly to the discharged or doffed bobbin which has been dropped into the chute after its release from the winding spindle. Automatically-operated mechanism is usually provided for returning the thread-guide to first position to start the winding of a new bobbin and for sliding the yarn-retriever back with the guide to hold a length of the yarn delivering from above in position for attachment to the fresh bobbin.

The machine illustrated herein utilizes the thread-guide 10 and thread-retriever 11 for carrying the yarn back into position to be engaged by the attaching means on the barrel *b* of the bobbin B. Instead of carrying the yarn clear back against the spindle-center 2 on the winding spindle 3 to lay it across the hollow end thereof, with the present improved attaching means it is only necessary that the yarn be carried back to approximately its initial winding position and the operation of fastening the end of the strand to the bobbin B is accomplished automatically and rendered more secure.

In a preferred form of construction the end-attaching device shown in Figs. 1, 2 and 3 may consist of a sleeve or ferrule surrounding the barrel *b* of the bobbin B adjacent its head *h* with prongs or fingers projecting therefrom at one end. For example, the attaching element may comprise a slightly tapered tube or sleeve 15 constructed of relatively thin metal, such as brass or the like, and fitted snugly to the tapered barrel *b* of the bobbin. For holding the sleeve or ferrule 15 rotatively and longitudinally of the barrel *b* of the bobbin B its metal may be indented at 16 with a prick-punch or other tool to project teeth or spurs 17 into its interior for biting into the wood or other material of the barrel. The forward end of the sleeve or ferrule 15 may be serrated to provide a plurality of prongs or fingers 18 adapted to catch the strand of yarn *y* thereunder as it is drawn along the peripheral surface of the barrel *b* of the bobbin B, see Fig. 2, to hold it as the bobbin starts to rotate. In order to provide a space between the under side of the prongs or fingers 18 and the periphery of the barrel *b* of the bobbin B the barrel may be scored or grooved as shown in Fig. 3 to form a recess 19 extending circumferentially thereof. Thus, as the yarn is drawn back by sliding it along the side of the barrel *b* it will ride in under one or more of the fingers 18 to be caught and held thereby as the bobbin starts to rotate to wind on the yarn.

Figs. 4 and 6 of the drawings illustrate a modified form of ferrule designated 20 in which the prongs or fingers 21 are bent or sprung outwardly to space them from the periphery of the barrel *b* of the bobbin B without the necessity for scoring or turning a groove or recess in its circumference. This latter form of construction avoids mutilating the barrel of the bobbin and provides that the present improved strand-attaching means or ferrule may be applied to bobbins already in use without alteration of their construction.

It has been stated that the present invention is particularly adapted for application to bobbins used in automatic winders, but it is to be understood that it may also be applied to other types of yarn-carriers such as the tubular cores for supporting various forms of yarn packages. The bobbin B shown herein is of the type used in automatic looms, but for certain other uses the bobbin or package-core may be headless and consist merely of a straight or tapered barrel and likewise, the present invention is applicable to use with spools or the like having heads at their ends. Moreover, its application to bobbins or package-cores for use in machines other than automatic bobbin winders is of advantage; for example, whenever the end of a yarn must be connected to the core before the winding starts its attachment may be accomplished manually by simply drawing the strand along the barrel of the bobbin, tube or the like and engaging it under one or more of the prongs or fingers on the ferrule 15 or 20.

Referring to Figs. 1 and 2 of the drawings, it will be understood that after the machine herein illustrated has operated to doff a wound bobbin a fresh bobbin B may be donned before the thread-guide 10 is returned to first position to again start the winding operation. After the bare bobbin has been applied to the winding spindle by seating its head *h* in the hollow spindle-center 2 and its opposite tip end in the recess of the spindle-center 4, the thread-guide 10 is slid to the left, as viewed in Fig. 1, with

the yarn-retriever 11 cooperating therewith; it being understood that the dropping out of the wound bobbin carries the yarn strand downwardly to engage it in the clip 12 so that it is pinched between the two spring-operated ears 13 and 14. The yarn *y* usually delivers from a source of supply arranged above and when the winding of a bobbin is finished the strand will be held in the guide 10 at the outer end of the completed bobbin so that as the latter drops during its doffing the strand will be drawn down into place between the ears 13 and 14 of the clip 12. Consequently, the yarn-retriever 11 may be moved back by or with the receding movement of the thread-guide 10 to carry the strand back and engage it with the attaching means or ferrule 15 immediately the fresh bobbin has been donned and connected to the spindle-center. As soon as the attachment is accomplished the winding spindle 3 is started automatically to wind the yarn on the barrel of the bobbin B and the length leading from its point of attachment to the bobbin downwardly to the doffed bobbin may be severed by suitable means, not herein shown or described as such cutting-off devices are well known and previously used in the present art. In accordance with the usual practice in automatic bobbin-winders, where the yarn is fastened to the bare bobbin by pinching it between the head of the bobbin and the spindle-center or cup, it must be severed near the starting point of the windings and consequently a loose end is left extending across the head of the bobbin. When the bobbins are doffed these loose ends are released and rendered liable to be caught in the winding mechanism to interfere with its functioning or to otherwise hamper the proper operation of the machine. With the present improved attaching means the end of the yarn may be severed adjacent the point where it is wound on the barrel of the bobbin so that no loose end will be left since the length leading to the doffed bobbin will be carried away or otherwise disposed of.

It is to be understood that with the present improved method of attaching the yarn it is caught under one or more of the fingers on the ferrule so that immediately the bobbin starts to rotate the strand will be caused to wind around the barrel of the bobbin to secure it thereto. That is to say, with fine yarns it is unnecessary to pinch the strand against the barrel of the bobbin but only to hold it as the bobbin rotates to cause the windings to attach it securely to the barrel of the bobbin. When winding relatively coarse yarns the strand may be pinched against the barrel of the bobbin, but such pinching or seizing is unnecessary in most cases for the reasons stated.



It will be observed from the foregoing description that the present invention provides an extremely simple means for attaching the end of a strand of yarn, thread or the like to a bobbin, spool or other type of package-core or carrier, and one which is efficient and dependable in operation for use in automatic bobbin winders or with different machines for manual operation.

While the improved device is herein illustrated in its preferred form of construction with one modification thereof, it is to be understood that variations may be made in the shape and arrangement of the device without departing from the scope or spirit of the invention. Therefore, without limiting myself in this respect, I claim:

In a weft or filling bobbin for use in automatic winding machines for winding filling yarn for the shuttles of looms, a substantially cylindrical barrel terminating in an enlargement or head at one end, and a tubular metal ferrule surrounding the barrel adjacent its head and fixedly secured thereto, said ferrule having its end remote from the head of the bobbin serrated to provide a plurality of closely spaced fingers completely encircling the entire circumference of the barrel and spaced from the peripheral surface thereof in substantially parallel relation thereto to provide for engaging a strand of yarn or the like thereunder as it is slid along the barrel from its tip end towards the head whereby to fasten the end of the yarn to the bobbin for winding it thereon.

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