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ADJUSTABLE SPINNING CAP

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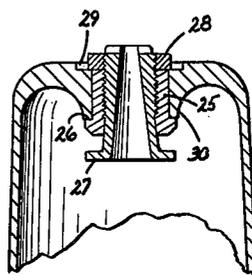
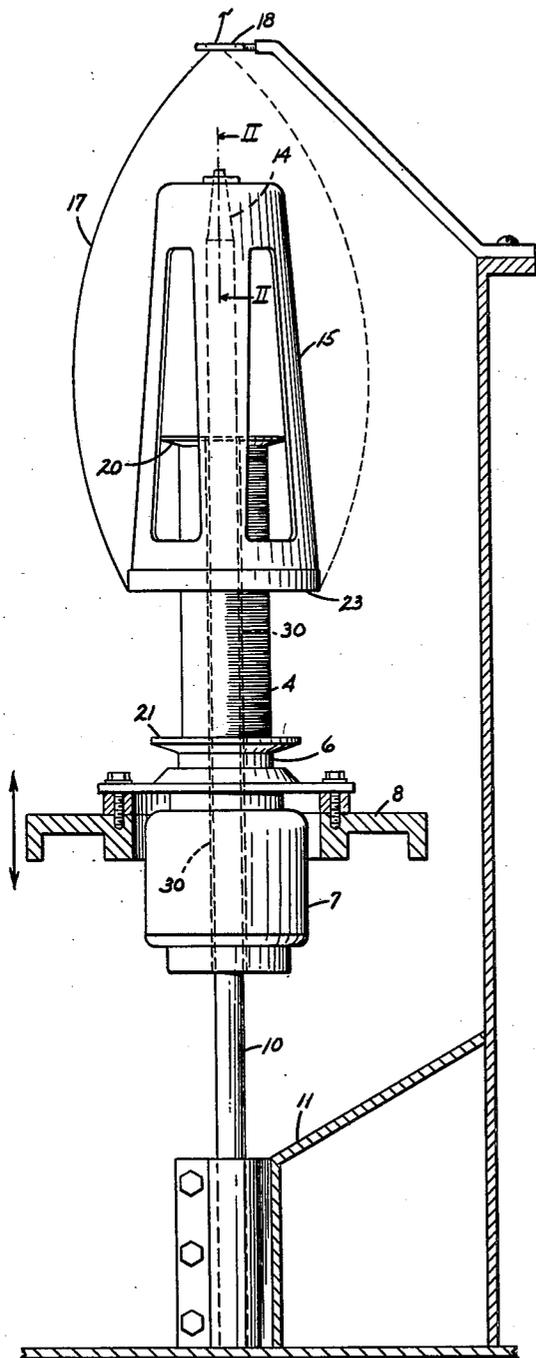


Fig. 2

Fig. 1

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## ADJUSTABLE SPINNING CAP

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7 Claims. (Cl. 57—127)

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This invention relates to spinning apparatus of the type in which a bobbin is in reciprocable and rotatable relationship with a strand or thread-guiding cap supported on a seating surface of a spindle. The term "strand" includes all types of continuous filamentary or fibrous bundles that may be subjected to a twisting procedure in apparatus of the type herein described.

In order to obtain the proper disposition of the thread or other strand upon a bobbin supported within a machine of this type, it is essential that the reciprocal motion of either the bobbin or the cap with respect to the other be such that at the ends of the stroke, the ends of the strand-receiving surface of the bobbin are brought accurately into alignment with the path of the yarn or thread passing from the strand-aligning edge of the cap to the bobbin. For example, if the bobbin reciprocates with respect to the cap, and assuming the reciprocable ambit of the bobbin to be of the proper length, an accurate correlation between the edge of the cap and the bobbin stroke will produce a regularly shaped bobbin. When the bobbin stroke is not properly matched with the strand guide, the bobbin will receive insufficient strand at one end and an excessive amount at the other end which may produce tangling of the strand. Such a condition is frequently brought about, for example, when one cap is replaced during the routine servicing of the spinning machine by another cap which is supported by the spindle in such an alignment that its strand-guiding edge is out of proper relationship with the ambit of the bobbin. In the conventional machine, the spindle is then adjusted to obtain the correct position of the strand-guiding edge of the cap.

It is an object of the invention to provide readily adjustable means for properly positioning the strand-guiding surface of a cap with respect to the strand-receiving surface of a bobbin when there is relative reciprocal movement between the cap and the bobbin in a direction lengthwise of their axes. It is another object to avoid the production of improperly formed bobbins and the necessity for removing damaged yarn therefrom. Other objects, features and advantages will be apparent from the following description of the invention and the drawing relating thereto in which

Fig. 1 is an elevation view partly in section of a winding machine embodying an adjustable cap constructed according to the invention; and

Fig. 2 is an enlarged fragmentary section view of the portion of the cap illustrating in detail the adjustable feature thereof,

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These objects and others which will become apparent as the invention is described, are accomplished by providing a thread-guiding cap which is readily adjustable with respect to the seating surface of a support therefor, such as the spindle of a spinning machine in which there is relative reciprocal movement between a rotating bobbin and the spindle in a direction lengthwise of the spindle.

Fig. 1 illustrates a spinning machine of the thread-guiding cap type in which a bobbin 4, a bobbin support 6 and a motor 7 for rotating the bobbin, are secured to a frame member 8. This assembly reciprocates in a direction lengthwise (vertically, as viewed in Fig. 1) of a stationary spindle 10. The spindle 10 is secured by its lower end within the frame 11 and supports the thread-guiding cap 15 on the tapered surface 14 of its upper end portion. Thread is continuously drawn through a fixed thread-guide 18 and the balloon 17 from a strand supply means (not shown). The bobbin moves with the members 6, 7 and 8 as a unit in reciprocal movement through an ambit equaling the distance between the ends 20 and 21 of the bobbin 4 past the thread-guiding surface 23 of the cap 15.

Adjustability of the cap 15 with respect to the spindle 10 in a direction parallel to the direction of reciprocation of the bobbin is obtained from the threaded relationship between an interiorly-threaded sleeve 25 and an exteriorly-threaded sleeve 27. The sleeve 25 extends through a bore provided through the upper end of the cap and is centered along the axis of the cap. The sleeve 25 has an outer cylindrical surface of the same length as the complementary inner surface of the bore, and an annular flange 26 extending outwardly from an end of its outer cylindrical surface. Consequently, the two sleeves may be secured within the end of the cap when a lock nut 28 is tightened against the end of the sleeve, and the surface of a recess 29 which the nut engages in overlapping relationship; the flange 26, of course, engages the annular shoulder 30 of the cap. The inner frusto-conical surface of the sleeve 27 is accurately contoured to match the seating surface 14 of the spindle 10.

As spinning caps are frequently changed for maintenance reasons, the adjustability obtained through the present invention has an important advantage in that caps may be exchanged on the spinning equipment without adjustment of the spindles. Due to inaccuracies in manufacturing and in repairing the caps and spindles of the conventional machines, the proper relationship be-

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tween the thread-guiding edge of the cap and the bobbin path needed to obtain satisfactory bobbin-building is seldom obtained without readjustment of the vertical position of the spindle. The high degree of interchangeability resulting from accurately fitting caps is now obtained by adjusting all spindles of a machine or a group of machines to a properly adjusted cap, or a master cap. The caps to be used on the spindles may then be adjusted on a master spindle which may be kept in any convenient location for servicing the caps. By such a method, any cap fits any spindle and there is no further necessity for making adjustments at the time of installing or replacing the caps.

In the practice of the invention, it is immaterial whether the bobbin and the supporting structure therefore reciprocate with respect to the thread-guiding cap, or that the cap be reciprocated while the bobbin is held stationary. The thread guide 18 is supported in either case at a fixed distance from the cap in order to maintain a balloon of constant length and shape.

On large scale spinning operations, the advantages of using preadjusted caps and spindles are particularly apparent. When using conventional non-adjustable caps, an entire spinning machine comprising a dozen or perhaps two dozen or more spinning units must be stopped while adjusting the spindle to obtain the desired vertical position of the cap. Such a shutdown results in an extended doff period for all of the bobbins being wound by the machine, or if a regular doffing schedule is followed for the machine, a shortened doff period resulting in incompletely filled bobbins. Moreover, the invention has the advantage of reducing or eliminating the amount of scrap yarn which accumulates on godet wheels which feed the yarn to the bobbins while adjusting a spindle. Consequently, an adjustable cap of the type herein described permits the preadjustment of caps and spindles to standard settings. The interruptions in the operation of equipment thus avoided permit large scale spinning of yarn at greater efficiency, larger percentage of filled bobbins, and more accurately built and uniformly shaped bobbins.

While a preferred embodiment of the invention has been shown and described, it is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A strand-guiding cap for a spinning machine comprising an annular strand-guiding surface at one end of the cap, an aperture extending through the opposite end of the cap centered on the axis of said surface, a sleeve extending through the aperture having an inner surface adapted to seat upon a surface for supporting the cap, and means for adjusting the sleeve with respect to the aperture in a direction parallel to the axis.

2. A machine comprising a cap having an annular strand-guiding surface at one end and an aperture extending through the opposite end of the cap centered on the axis of the strand-guiding surface, a spindle having a seating surface

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for supporting the cap, a sleeve extending through the aperture having an inner surface which is complementary to the seating surface, and means for adjusting the sleeve with respect to the aperture in a direction parallel to the axis.

3. A strand-guiding cap for a spinning machine comprising an annular strand-guiding surface at one end of the cap, an interiorly-threaded aperture concentrically disposed about the axis of the surface at the opposite end of the cap, a sleeve extending through the aperture in threaded relationship therewith and having an inner surface adapted to seat upon a surface for supporting the cap.

4. A spinning machine comprising a cap having an annular strand-guiding surface at one end and an aperture extending through the opposite end of the cap centered on the axis of the strand-guiding surface, a spindle having a tapered seating surface for supporting the cap, a sleeve extending through the aperture having an inner tapered surface which is complementary to the seating surface, and means for adjusting the sleeve with respect to the aperture in a direction parallel to the axis.

5. A spinning machine comprising a cap having an annular strand-guiding surface at one end and a threaded aperture extending through the opposite end of the cap centered on the axis of the strand-guiding surface, a spindle having an annular tapered surface for supporting the cap, a sleeve having an exterior surface in threaded relationship with the aperture and an interior annular tapered surface which is complementary to the seating surface.

6. A spinning machine comprising a cap having an annular strand-guiding surface at one end and an aperture extending through the opposite end of the cap centered on the axis of the strand-guiding surface, a spindle having an annular tapered seating surface for supporting the cap, an interiorly-threaded sleeve member extending through the aperture and secured therewithin, an exteriorly-threaded sleeve member extending in threaded relationship through the first named sleeve member and having an interior annular tapered surface complementary to the seating surface.

7. A spinning machine comprising a cap having an annular strand-guiding surface at one end and an aperture extending through the opposite end of the cap centered on the axis of the strand-guiding surface, a spindle having a frusto-conical seating surface for supporting the cap, an interiorly-threaded sleeve member having an annular flange which overlaps the aperture at the end of the sleeve nearest the end of the cap defined by the thread-guiding surface, an exteriorly-threaded sleeve member extending in threaded relationship through the first named sleeve member and having an interior frusto-conical surface complementary to the seating surface, and a lock nut for the exteriorly-threaded sleeve which overlaps the edge of the aperture.

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No references cited.