

June 19, 1962

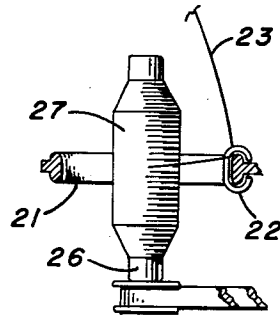
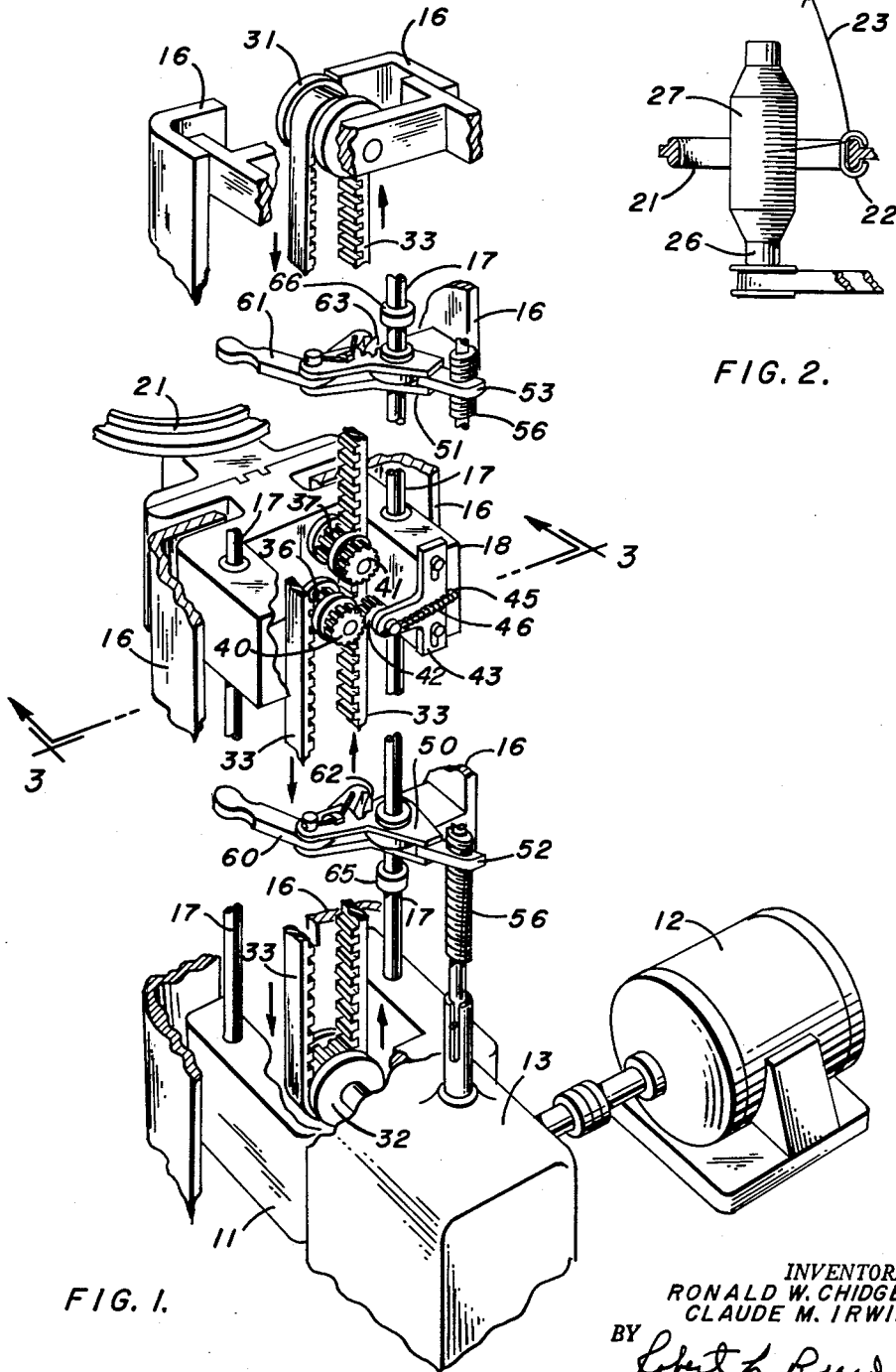
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3,039,708

TRAVERSING DEVICE

Filed Jan. 21, 1960

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

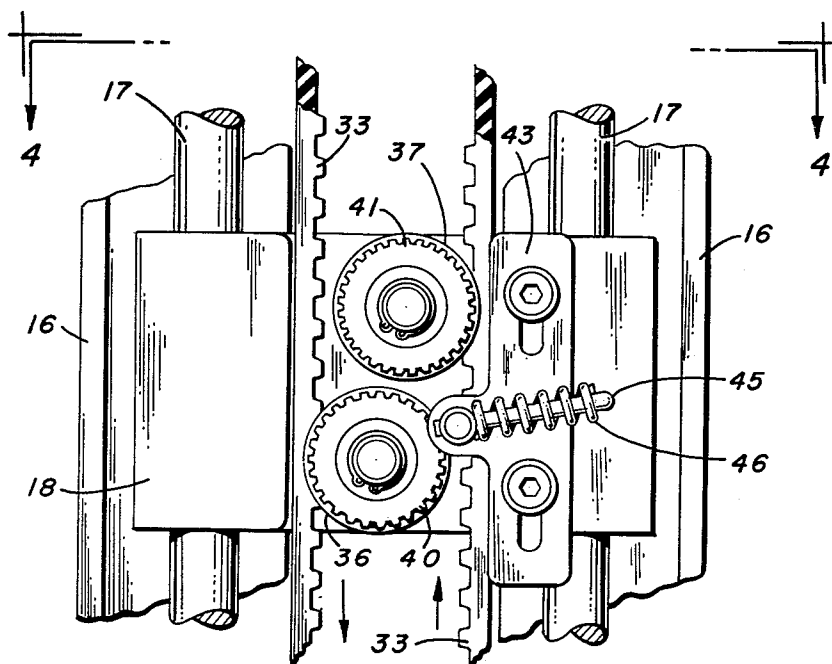


FIG. 3.

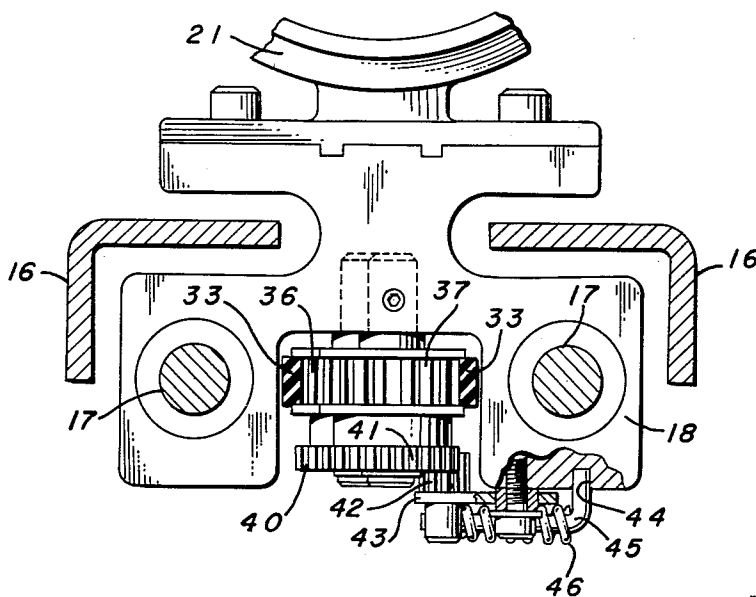


FIG. 4.

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TRAVERSING DEVICE

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1 Claim. (Cl. 242-26.3)

This invention relates to traversing devices and more particularly to devices for rapidly traversing yarn being wound onto a bobbin.

One of the more common types of yarn package is one that has a cylindrical central portion and tapered ends, this being a configuration which permits a greater amount of yarn to be loaded onto a bobbin. It is well known that, when a synthetic yarn is wound by conventional machines into a package of this type, the yarn in the tapered ends of the package undergoes undesirable changes in characteristics. The changes in yarn characteristics are believed to be caused by a reorientation of molecules in the fiber or a change in denier resulting from shrinkage of the yarn on the bobbin. Yarn traversing devices used in the past cannot traverse the yarn at a uniform speed and are not capable of traversing speeds high enough to prevent changes in the characteristics of the yarn. As a result of these changes in characteristics, when the yarn is woven into a fabric, the fabric will have streaks which make it unusable. These streaks are commonly referred to as "pirn taper barre," since the yarn to be found in the streak comes from the tapered end of the yarn package. With this problem in mind, one of the objects of this invention is to provide a novel and improved traversing mechanism.

Another object of this invention is to provide a mechanism for traversing a yarn at a high speed.

A further object of this invention is to provide a mechanism for traversing a yarn at a uniform speed without a decrease in traversing speed near the ends of the traversing stroke.

Still another object of this invention is to provide a mechanism wherein a traversing block is reciprocated by a moving belt.

A still further object of this invention is to provide a traversing mechanism wherein a traversing block is provided with gears meshing with a moving timing belt and which are alternately locked to reciprocate the traversing block at a uniform and high speed.

One of the embodiments of this invention contemplates a traversing mechanism wherein a traversing block carrying a ring traveler is provided with a pair of gears meshed with a timing belt which is driven in such a manner that one portion or span of the belt is moving in one direction and the other portion or span of the belt is moving in the opposite direction parallel to a bobbin situated concentrically within the traveler ring. One of the gears is meshed with the span of the belt moving in one direction and the other gear is meshed with the span of the belt which is moving in the opposite direction. The gears are adapted to be locked on alternate strokes of the traversing block in such a manner that the traversing block is first attached to one span of the timing belt by means of one of the locked gears and is then attached to the other span of the belt by the locking of the other gear. From this it can be seen that the traversing block is rapidly reciprocated without a decrease in traversing speed near the end of the traversing stroke.

Other objects and advantages of this invention will become apparent by reference to the following detailed description in conjunction with the appended drawings, in which:

FIGURE 1 is a fragmentary perspective view of one

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embodiment of the invention showing the general layout of the various elements of the device;

FIGURE 2 is a reduced fragmentary view showing yarn being wound onto a bobbin to form a package having tapered ends;

FIGURE 3 is an enlarged front view of the traversing block showing one of the gears locked so that the traversing block is attached to the moving belt; and

FIGURE 4 is a top view of the traversing block showing the arrangement of the various elements carried by this block.

Referring now in detail to the drawings, a base 11 is shown adjacent to a driving motor 12 and a gear box 13 which power the mechanism of the present invention. The base 11 has attached thereto a pair of vertically extended brackets 16 which cooperate with the base 11 to support a pair of guide rods 17.

A traversing block 18 slidably mounted on the guide rods 17 carries a ring 21 of a well-known type which is provided with a traveler 22 for directing yarn 23 onto a bobbin 26 mounted concentrically within the ring 21 and rotated in a well-known manner by apparatus of a well-known type. Reciprocation of the ring 21 applies the yarn 23 to the rotating bobbin 26 to form a package 27 in a well-known manner.

A pulley 31 supported by the brackets 16 cooperates with a pulley 32 to carry a timing belt 33, the pulley 32 being driven from the gear box 13 in such a manner that the left portion or span (FIGURE 1) of the belt 33 moves downward while the right portion or span of the belt 33 moves upward. A gear 36 rotatably mounted on the traversing block 18 meshes with the left span or portion of the timing belt 33 and another gear 37 rotatably mounted on the traversing block 18 is meshed with the right portion or span of the belt 33. The gears 36 and 37 are provided with knurled flanges 40 and 41, respectively, which are adapted to be engaged by a knurled locking lug 42 rigidly attached to a plate 43 slidably mounted on the traversing block 18.

An L-shaped pin 45 having one end extending through an aperture in the locking lug 42 and the other end extending into a hole 44 (FIGURE 4) in the traversing block 18 is provided with a compression spring 46 which urges the plate 43 with the locking lug 42 toward one of its extreme positions, that is, its lowermost position or its uppermost position. The spring 46 on the pin 45, which pivots in the hole 44, imparts a snap action to the plate 43 so that it shifts from one position to the other instantaneously.

When the plate 43 with the locking lug 42 is in its lowermost position, the locking lug 42 engages the knurled flange 40 on the gear 36 to prevent rotation of this gear. When the gear 36 is locked, movement of the left portion or span of the belt 33 relative to the traversing block 18 is prevented and the traversing block 18 moves downward. During this downward movement, the gear 37 rotates freely as the right portion or span of the belt 33 moves upward past it. When the plate 43 with the locking lug 42 is in its uppermost position, the locking lug 42 engages the knurled flange 41 on the gear 37 to prevent rotation of this gear. This prevents relative movement between the right portion or span of the belt 33 and the traversing block 18 so that the block 18 moves upward with the right portion or span of the belt 33. During this upward movement the gear 36 rotates freely. Thus, the position of the plate 43 and the locking lug 42 determines the direction of movement of the traversing block 18 and the ring 21.

For moving the plate 43 to reverse the direction of movement of the traversing block 18, a pair of striker plates 50 and 51 (FIGURE 1) are slidably mounted on one of the guide rods 17 and are provided with squared

ends which slide along one of the brackets 16. The striker plates 50 and 51 are provided with fingers 52 and 53 which have threaded ends adapted to engage an elongated screw 56 rotatably mounted on the brackets 16 and the gear box 13. The screw 56 is threaded in opposite directions at its opposite ends and is driven through the gear box 13 in such a direction that the striker plates 50 and 51 are slowly moved toward each other as the winding operation takes place.

Spring loaded latches 60 and 61 (FIGURE 1) are provided with hooked ends which are adapted to engage projections 62 and 63, respectively, on the striker plates to retain the threaded fingers 52 and 53 out of engagement with the screw 56 when it is desirable to manually move the striker plates along the guide rod 17 into engagement with collars 65 and 66 adjustably secured to the guide rod 17. This movement is necessary prior to each winding operation in order to start the striker plates from positions engaging the collars.

In operation of the device the traversing block 18 is reciprocated between the striker plates 50 and 51 to form the package 27. As illustrated in FIGURE 1, the gear 36 is locked by the lug 42 so that the left portion or span of the belt 33 is securely connected to the traversing block 18. Inasmuch as the left portion or span of the belt 33 is moving downward, this carries the traversing block 18 and the ring 21 downward.

When the traversing block 18 nears the lower striker plate 50, the plate 43 engages the plate 50 and is stopped, thereby moving the locking lug 42 upward to lock the gear 37 and release the gear 36. This connects the right portion or span of the belt 33 to the traversing block 18, thereby causing the traversing block and the ring 21 to be carried upward. As the traversing block 18 approaches the upper striker plate 51, the plate 43 engages the plate 51 and is stopped. This moves the plate 43 downward, relative to the block 18, to release the gear 37 and lock the gear 36. This causes the traversing block 18 to move downward. In this manner, the traversing block 18 is reciprocated at a high and uniform speed to form the package 27.

During the winding operation, the screw 56 is slowly rotated to move the striker plates 50 and 51 together. As these plates move closer to each other, the traversing stroke of the block 18 is reduced. This results in a yarn package having tapered ends, such as that disclosed in FIGURE 2.

The result of the above-described construction is that the block 18 is traversed at a high speed without a decrease in speed near the end of the traverse stroke, as is common in previously used traversing devices. This insures that, when the yarn 23 is woven into a fabric, no pin taper barre will be present therein.

It is to be understood that the embodiment disclosed herein may be altered or modified and that many other embodiments may be contemplated without departing from the spirit and scope of this invention.

What is claimed is:

A device for winding yarn onto a rotating bobbin, comprising a base, a frame mounted on the base, a traversing block slidably mounted on the frame along a path parallel to the axis of the rotating bobbin, said traversing block carrying a ring having a ring traveler for guiding yarn onto said bobbin, a pair of pulleys mounted on the frame, a timing belt mounted on the pulleys in such a manner that said belt forms two spans parallel to the axis of the bobbin, means on the base for driving one of said pulleys to cause one of said spans to travel in one direction, a first gear rotatably mounted on the traversing block and meshed with said one span of the timing belt, a second gear rotatably mounted on the traversing block and meshed with the other span of said belt, said gears being spaced apart along said spans, each of said gears having attached thereto a knurled flange, a plate slidably mounted on the traversing block in a direction parallel to said spans and having ends extending on opposite sides of said block, a locking lug carried by the plate to alternately engage the knurled flanges attached to the gears and to thereby alternately lock said gears when said plate and lug are moved on the traversing block in said parallel direction, a pin pivotally attached to the traversing block and engaging the locking lug, a compression spring mounted on the pin and engaging the locking lug for urging said lug toward whichever knurled flange is nearer to thereby impart a snap action to said locking lug, a pair of striker plates slidably mounted on the frame on opposite sides of the traversing block and adapted to engage and stop the plate carried by said traversing block so that further movement of the traversing block moves one of the gears away from the locking lug and the other gear into engagement with said locking lug for changing the direction of traverse of said block, and means on the frame for moving the striker plates toward each other as the traversing block is reciprocated.

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