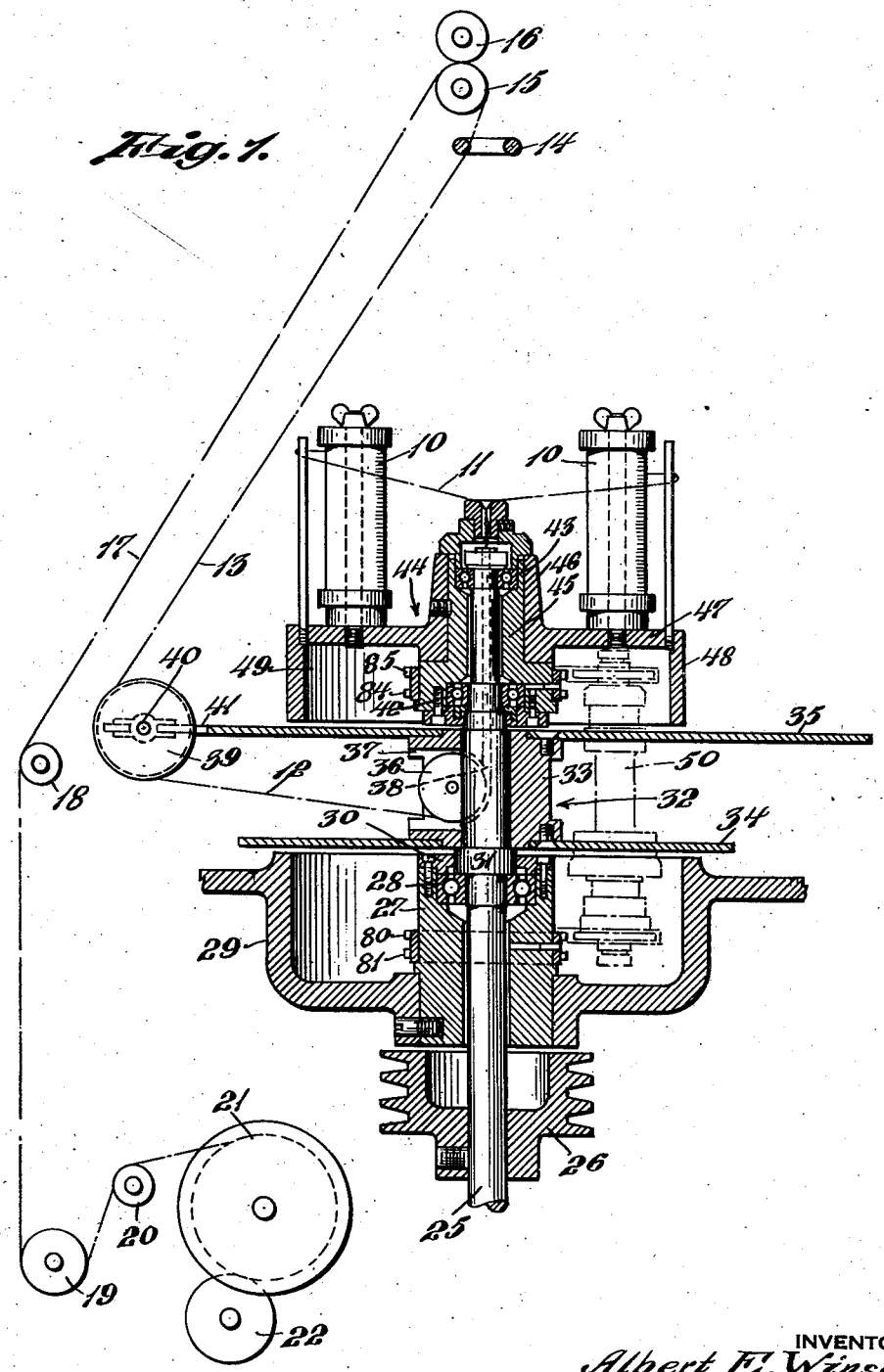
July 4, 1944. A. E. WINSLOW 2,353,102

STRAND TWISTING APPARATUS

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Fig. 1.



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Fig. 2.

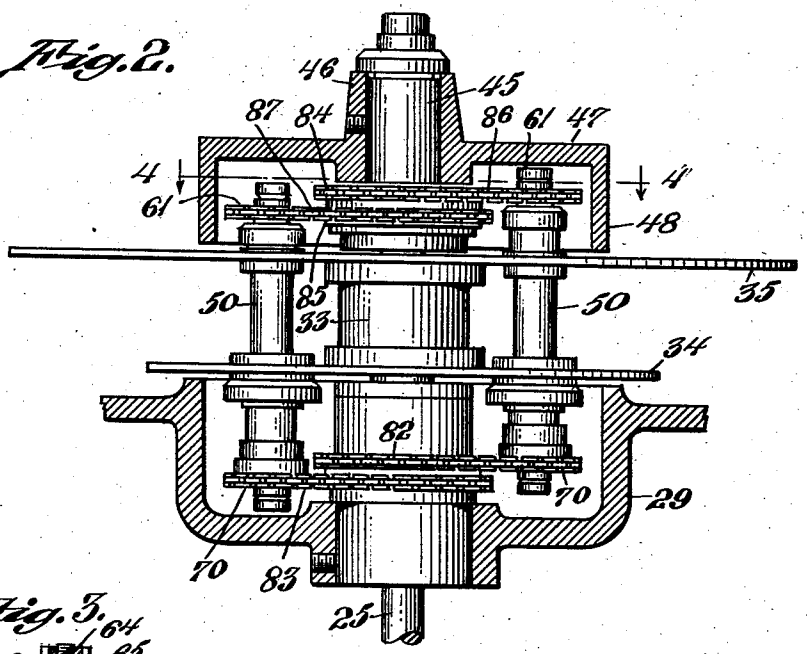


Fig. 3.

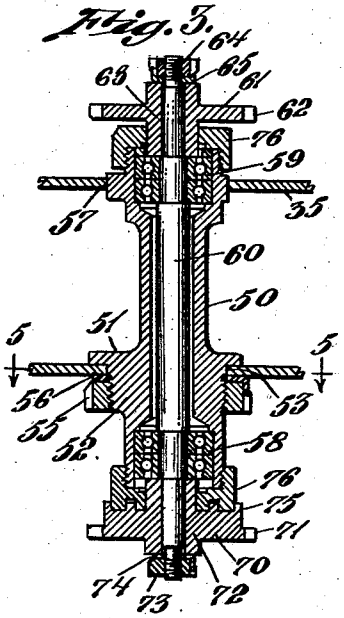


Fig. 4.

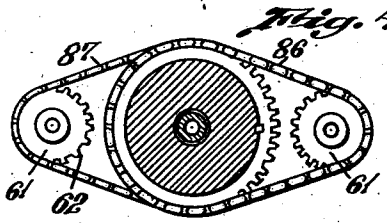
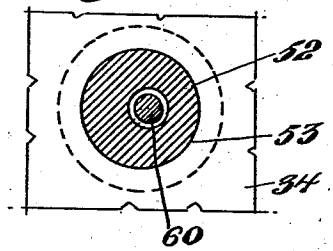


Fig. 5.



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2,353,102

STRAND TWISTING APPARATUS

Albert E. Winslow, Mystic, Conn., assignor to Atwood Machine Company, a corporation of Connecticut

Application October 29, 1943, Serial No. 508,129

4 Claims. (Cl. 57—58)

This invention relates to a device for the twisting or laying of strand material and more particularly to a device adapted to impart more than one turn of twist to one or more strands for each revolution of the flyer.

In such a device the package or packages from which the strand material is supplied do not partake of the revolution of the flyer. The strands are drawn from the supply package or packages in a manner to form a loop which is carried by the flyer around the package or packages. Assuming the supply package to be mounted on a stationary axis, two turns of twist are imparted for each revolution of the loop about the package. The manner in which the supply package support is held stationary while mounted upon a rotating spindle with the yarn looping about the supply package has been accomplished in various ways and it is the means by which this result is accomplished which is the feature of this invention.

One of the objects of this invention is to provide a simple and efficient manner of positively holding the supply package support stationary while being mounted upon the revolving spindle which rotates the strands about the package support.

Another object of this invention is to provide a positive drive through the flyer from a stationary frame to the supply package support so as to prevent slip between the driving parts.

Another object of the invention is to provide a drive between the different parts by means of chain and sprocket gear to prevent slipping.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is a diagrammatic view showing parts in section illustrating the spindle, the support for the supply packages, and the driving arrangement which is the subject matter of this invention, an assumed position of the flyer drive shaft being shown dotted;

Fig. 2 is a fragmental sectional view showing the flyer at right angles to the position shown in Fig. 1;

Fig. 3 is a sectional view illustrating the mounting of one of the shafts carried by the flyer;

Fig. 4 is a section on line 4—4 of Fig. 2;

Fig. 5 is a section on line 5—5 of Fig. 3.

The invention illustrated in this application forms an alternative arrangement of a part of a larger machine which is shown in my co-pending application Serial No. 517,859. The supply packages are designated 10 from which the strands of material 11 lead into the hollow spindle then downwardly together and radially outwardly as at 12 and thence upwardly as at 13 to loop the strands upon themselves, which loop is revolved about the axis of the spindle so that two turns of twist or lay are placed into the strands for each single turn that the loop makes about the spindle. The upwardly extending run of the work 13 is then guided from the machine through the ring 14 and between feed rolls 15 and 16 and thence led as at 17 over pulley 18 and over suitable guides 19 and 20 to be packaged as at 21, the package being operated by a surface drive 22 as diagrammatically shown in Fig. 1.

A suitable spindle 25 is belt driven by a pulley 26 which is mounted on the spindle. The spindle extends upwardly through a bushing 27 supporting the ball bearing 28 which is held in place by a cover 30, all in fixed relation to the stationary framework 29 of the machine. The spindle is shouldered as at 31 which provides a seat for a flyer designated generally 32 and which consists of a hub 33 with a lower disk 34 secured at one end thereof and an upper disk 35 secured at the other upper end thereof. A guide sheave or pulley 36 is located in a recess 37 in this hub 33 and has its inner edge tangent with a hollow bore 38 in the spindle so that as the work is led downwardly through the hollow spindle and over the pulley 36 it may extend radially outwardly over the pulley sheave 39 which is located in recess 41 in the edge of the flyer disk 35 and rotatably mounted in a bearing 40.

Above the flyer 32 the spindle is further shouldered for the reception of ball bearings 42 and 43 for rotatably mounting the supply package support or creel 44 comprising a hub 45 engaging the ball bearing and a sleeve 46 fixed on this hub from which a deck plate 47 extends at right angles to the hub and spindle. The deck plate is flanged as at 48 leaving a hollow portion 49 in which the flyer drive shaft extends.

Supported by the disks 34 and 35 (see Fig. 3) are sleeves 50 each of which is provided with a flange 51 and a reduced threaded portion 52 which extends through an opening 53 in the plate 34 and may be secured in different positions of rotation in the opening by means of a nut 55 and washer 56. The upper end of this sleeve is also enlarged to extend through and be rotatably mounted in an opening 57 in the plate 35. The

lower end of the sleeve 58 carries a ball bearing 58 while the upper end carries a ball bearing 59, both of which serve to rotatably mount the shaft 60 in a position which is off center with relation to the rotatably mounted sleeve (see Fig. 3). This shaft 60 carries a gear designated 61 at its upper end with teeth 62 adapted to receive a sprocket chain. The hub 63 of this gear engages the ball bearing while it is held in place by a nut 64 and lock washer 65. At the lower end there is a gear 70 which has sprocket teeth 71 along its periphery. A hub 72 engages the ball bearing 58 and is held in place by nut 73 and lock washer 74. Closure caps 76 extend over the ball bearings. The flange 75 extends over the lower closure cap 76 while a flange 77 fits into a groove in this lower cap.

The stationary bushing 27 is provided with a pair of toothed members or sprocket gears 80 and 81 which may be formed as one piece with the bushing. A chain 82 engages the gear 80 and extends to the gear 70, while a chain 83 engages the gear 81 and extends to another similar gear 70 for driving each of the shafts 60.

The hub 45 of the creel or supply package support is also provided with toothed members or sprocket gears 84 and 85, a chain 86 engages the gear 84 and extends about the gear at the upper end of shaft 60 while a companion chain 87 engages the gear 85 and extends to and about the gear 61 of the diametrically oppositely located shaft 60 on the other side of the flyer so located as to be in dynamic balance with the first said shaft. It will be readily apparent that any number of such shafts and gear and sprocket arrangements may be provided to secure the desired drive for the conveying of the drive of the flyer from the fixed gears in the stationary portion 27 through the flyer and back to the support for the supply packages or creel.

It will be readily apparent that if the diameters of the gears 80 and 81 are the same as the diameter of the gears 84 and 85 and the gears 61 and 70 are of the same diameter, rotation of the shaft 60 which is caused by revolving the flyer about the spindle will convey to the creel or supply package support a rotation in the opposite direction to the rotation of the flyer in the same amount that the shaft is rotated by the belt driving the shaft from the gears 80 and 81. Thus the creel or supply package support will remain in its same relative position to the frame or stationary as no slip will occur in the drives which are provided.

By revolving the sleeve 50 which has a shaft 60 to one side of the center of the portion 52 which extends through the opening 53 I may tighten the chain as the gears are thus moved relative to the axis of the spindle.

By the arrangement of chain and sprockets driving from a stationary gear to the flyer and from the shaft rotated in the flyer back to the creel or supply package support I have been able to provide a very simple and efficient means for mounting the creel or supply package support upon the spindle so that no motion of the supply packages occur as the spindle rotates while permitting of the loop to pass about the supply packages as rotation occurs.

I claim:

1. In a strand twisting device, a spindle, a supply package support with respect to which the spindle is rotatable, an annular toothed member carried by and fixed with relation to said support, a second annular toothed member stationary with respect to said spindle, a flyer carried by said spindle for revolving in a plane between the planes of said toothed members, a shaft carried by and rotatably mounted in the flyer and positioned to be revolved about said spindle, a pair of toothed members rotatable with said shaft and flexible means having driving relation between one toothed member of the shaft and the toothed member of the support and another flexible means having driving relation between the other toothed member of the shaft and the second toothed member, and means for tensioning said flexible means.

2. In a strand twisting device, a spindle, a supply package support with respect to which the spindle is rotatable, a gear carried by and fixed with relation to said support, a second gear stationary with respect to said spindle, a flyer carried by said spindle for revolving in a plane between the planes of said gears, a shaft carried by and rotatably mounted in the flyer and positioned to be revolved about said spindle, a pair of gears rotatable with said shaft and a chain having driving relation between one gear of the shaft and the gear of the support and another chain having driving relation between the other gear of the shaft and the second gear, and means for tensioning said chain.

3. In a strand twisting device, a spindle, a supply package support with respect to which the spindle is rotatable, a plurality of gears carried by and fixed with relation to said support, a plurality of second gears stationary with respect to said spindle, a flyer carried by said spindle for revolving in a plane between the planes of said gears, a plurality of shafts carried by and rotatably mounted in the flyer in equally angularly spaced relation and positioned to be revolved about said spindle, a plurality of annular gears rotatable with each of said shafts and a chain having driving relation between one annular gear of the shaft and one of the gears of the support and another chain having driving relation between the other annular gear of the shaft and one of the second gears.

4. In a strand twisting device, a spindle, a supply package support with respect to which the spindle is rotatable, a plurality of gears carried by and fixed with relation to said support, a plurality of second gears stationary with respect to said spindle, a flyer comprising a pair of disks carried by said spindle for revolving in a plane between the planes of said gears, a plurality of bearings carried by and rotatably mounted in the flyer in equally angularly spaced relation and positioned to be revolved about said spindle, a rotatable shaft carried by each of said bearings and movable about the axis thereof, a plurality of annular gears carried by and rotatable with each of said shafts and a chain having driving relation between one annular gear of the shaft and one of the gears of the support and another chain having driving relation between the other annular gear of the shaft and one of the second gears, said bearing eccentrically mounting said shafts and being rotatable about their own axes to move said shafts to tension said chains.

ALBERT E. WINSLOW.