Oct. 6, 1931. F. ENGEL 1,825,784

MEANS FOR MAKING ROUND PILES OF SLIVER IN CORDAGE MACHINES

Filed May 12, 1930 2 Sheets-Sheet 1

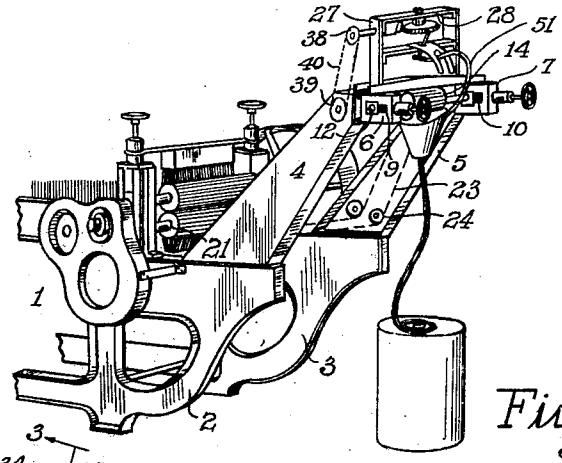


Fig. 1.

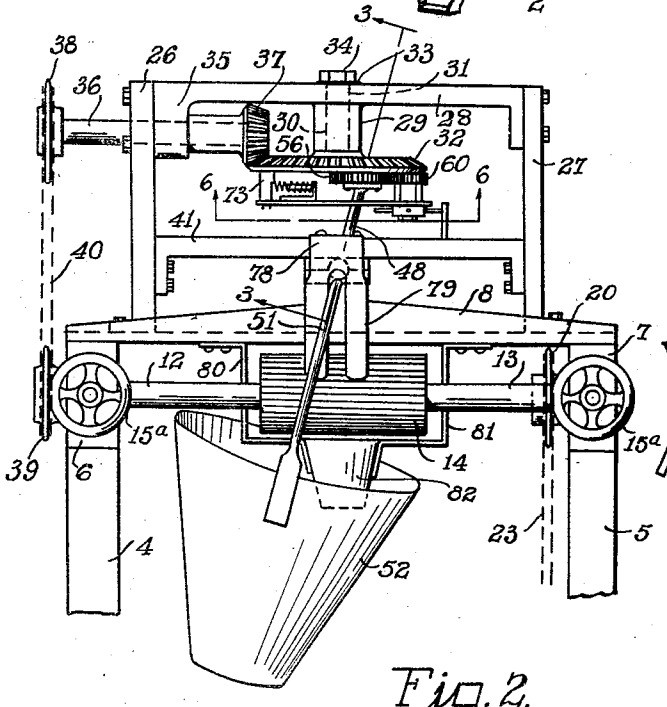


Fig. 2.

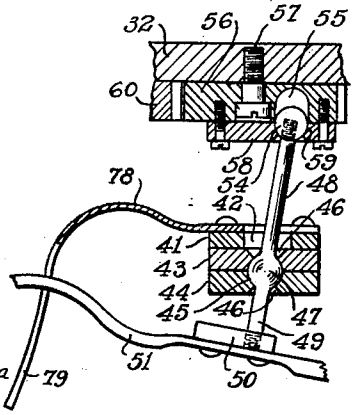


Fig. 3.

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Filed May 12, 1930 2 Sheets-Sheet 2

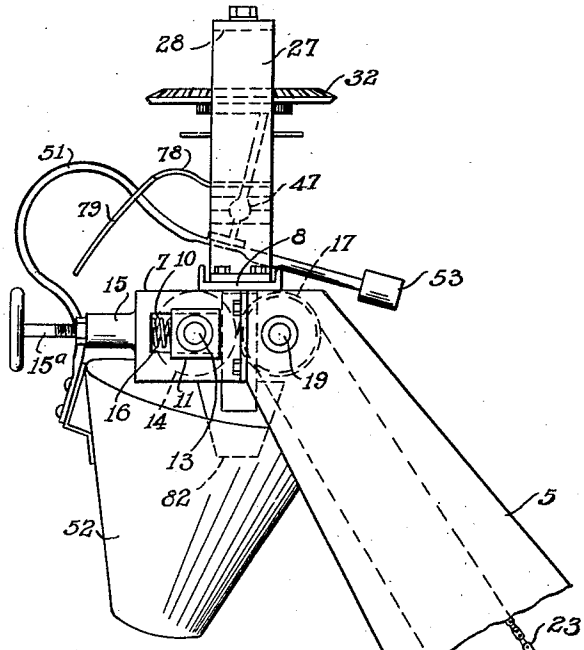


Fig. 4.

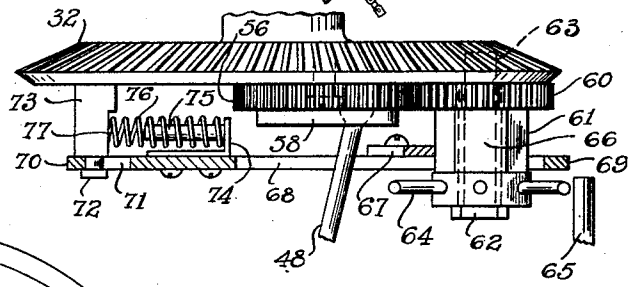


Fig. 5.

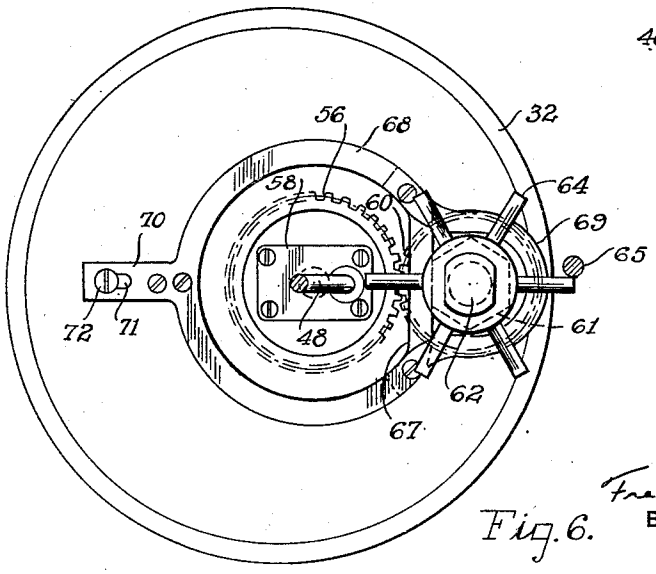


Fig. 6.

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Patented Oct. 6, 1931

1,825,784

UNITED STATES PATENT OFFICE

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MEANS FOR MAKING ROUND PILES OF SLIVER IN CORDAGE MACHINES

Application filed May 12, 1930. Serial No. 451,578.

My invention relates to improvements in means for making round piles of sliver in cordage machines, and more particularly to automatic pilers for attachment to breakers and spreaders employed in the preparation of sliver for the manufacture of rope.

It is one of the principal objects of my invention to provide an automatic piler that will produce a circular pile of sliver.

It is another object of my invention to provide an automatic piler that will produce a circular pile of sliver whose adjacent layers are eccentric, thus to produce an eccentric piling of the layers to render the pile less liable to damage in handling.

I have also produced an automatic piler of very simple structure, operable entirely from the breaker or spreader and eliminating auxiliary mechanism on the floor to shift the sliver receptacle to assist the piling action.

Other important features will be disclosed in the following specification and subjoined claims.

Figure 1 is a perspective view of my automatic piler attached to a conventional breaker. Figure 2 is an end view of my automatic piler. Figure 3 is a sectional view taken on the line 3—3 of Figure 2. Figure 4 is an end view of my automatic piler. Figure 5 is a detail view of the indexing mechanism. And Figure 6 is a detail view taken on the line 6—6 of Figure 2.

Referring to Figure 1 for a detailed description of my invention, the numeral 1 indicates a conventional breaker or spreader employed in the manufacture of rope and having side frames 2 and 3 from the rear end of which the feed rollers are removed.

Bolted to the top of the side frames and inclined rearwardly therefrom are two brackets 4 and 5 of channel section.

Secured to the rear vertical face of these brackets are two bearing supports 6 and 7 joined together across the top face thereof by a channel support 8. (See Figures 1 and 2.)

The supports 6 and 7 have rectangular openings 9 and 10 respectively to receive in each a bearing block 11 for shaft extensions 12 and 13 of a roller 14.

On the outer face of each support there is a cylindrical boss 15, threaded to receive an adjusting screw 15ª at its outer end to effect a variable pressure through a compression spring 16 inserted between the end of the rectangular openings 9 and 10 and the bearing blocks 11 on the roller 14.

Adjacent the roller 14 is a stationary roller 17 having shaft extensions that are journaled in the upper ends of the brackets 4 and 5, the shaft extension 19 being shown in Figure 4.

Mounted on the shaft extension 19 between the roller 17 and the bracket 5 is a sprocket 20. On the lower roller shaft 21 of the breaker or spreader 1 is a similar sprocket (not shown) and adapted to receive a sprocket chain 23 passing around the sprocket 20, downward under an idler 24, around the unseen sprocket to thus impart motion to the upper rollers 14 and 17. (See Figures 1, 2 and 3.)

Secured on the top of the support 8 and adjacent the support 4 is a vertical frame member 26. At the opposite end of the support 8 and between the rollers 14 and 17 and the support 5 is another vertical frame member 27.

Bolted to the uppper ends of the frame members 26—27 is a gear bracket 28 having at its center point a depending boss 29. (See Figure 2.) The boss 29 has a central aperture 30 to receive a shaft extension 31 of a bevel gear 32. The shaft is retained within the boss by means of a washer 33 and a lock nut 34 on the upper end of the shaft 31.

Between the boss 29 and the upright 26, and integral with the bracket 28 is a bearing 35 to receive the shaft 36 of a bevel pinion 37 meshing with the bevel gear 32.

Attached to the outer end of the shaft 36 is a sprocket 38, and attached to the left shaft extension of the roller 17 is another sprocket 39 over which a sprocket chain 40 passes to the sprocket 38. Now, as the rollers 14—17 are rotated, motion will be imparted to the bevel gear 32 through the above sprockets and chain.

Bolted between the frame members 26—27 and below the gear 32 is a bracket 41 having a central aperture 42 in alinement with the

gear 32. (See Figures 2 and 3.) Formed between two flat plates 43—44, bolted to the bottom of the bracket 41, is a spherical recess 45 preferably formed of Babbitt metal. On the opposite faces of the plates 43—44 are conical depressions 46 connecting with the recess 45. (See Figure 3.)

Contained within the recess 45 is a ball 47 integral with a rod 48 whose lower end 49 extends through the depression 46 in the plate 44 and has secured to the lower end thereof a plate 50.

Attached to the plate 50 is an inverted U shaped rod 51 to whose lower depending end there is attached a guider 52. (See Figure 4.)

To the opposite end of the rod 51 is attached a weight 53 to counter-balance the weight of the guider 52.

The upper end of the rod 48 terminates in a ball 54 received by an elongated spherical recess 55 within a gear 56 freely mounted upon a stud 57, received by the bevel gear 32.

The ball 54 is retained within the gear 56 by a plate 58 having a spherical depression 59 in its face adjacent the gear 56.

The gear 56 is eccentric to the center of the gear 32 and likewise the ball socket 55 is eccentric to the axis of the gear 56.

Meshing with the gear 56 is a second gear 60 having a ratio to the gear 56 of 5 to 6. This gear has a depending hub extension 61. The gear 60 is freely mounted on a stud 62, received by a threaded hole 63 in the gear 32. (See Figures 5 and 6.)

The lower end of the gear extension has equally spaced about its periphery six radial pins 64 adapted to be engaged by an index finger 65 secured to the bracket 41. Now as the gear 32 is revolved one of the pins 64 will engage the finger 65 to impart a partial revolution to the gears 56 and 60 to alter the eccentricity of the ball socket 55 respective to the axis of the gear 32. This change in eccentricity effects the radius of the circular path of the guider 52 and the resultant diameter of the pile of sliver.

The number of pins may be other than that herein disclosed to change the number of turns of sliver per layer.

As the gear 32 is rotated through the means previously described, the ball 54 will travel in a circular path about the axis of the gear 32 and through the ball and socket connection in the plates 43—44 will impart a circular motion to the guider 52 to produce a circular pile of sliver. Upon each revolution of the gear the diameter of the pile is either reduced or increased through the indexing means previously described.

The eccentric piling of the sliver is the result of the unequal diameters of the gears 56 and 60, in this case 6 to 5. As shown in Figure 6, the eccentricity of the ball 54 respective to the gear 32 is at its maximum. Now, as the gear 32 makes one revolution, the finger 65 will index the gear 60 1/6th of a revolution, and the gear 59 a less amount, or 5/36th of a revolution. It is thus seen that for one complete revolution of the gear 56, the gear 60 will make 1 1/16th revolutions and the maximum diameters of the piles of sliver will be spaced 1/6th of a revolution apart in the container therefor.

To prevent an overthrow of the indexing mechanism, I have provided a hexagonal shoulder 66 on the hub extension 61 of the gear 60. Contacting with the flat faces of the shoulder 66 is a keeper 67 secured to an elongated guide 68 whose one end 69 surrounds the shoulder 66 above the pins 64 and whose opposite enlarged end 70 is provided with an elongated slot 71 to receive the shank of a screw 72. The latter is received by a stud 73 secured to the lower face of the gear 32. (See Figure 5.)

Secured to the top of the guide 68 is an angle clip 74 having attached to its upper end a horizontally projecting spring guide 75 to receive one end of a compression spring 76 inserted between the clip 74 and a flat surface 77 on the stud 73 to hold the keeper 67 firmly against the shoulder 66.

Secured to the top of the support 41 above the plates 43—44 is a depending guide 78 having lower forked ends 79 through which passes the rod 51 to guide the latter in its circular motion.

On the under side of the bracket 8 at each end of the rollers 14—17 are two angle brackets 80—81 to support an auxiliary funnel-shaped guide 82 where the sliver enters the guider spout 52 to prevent it from leaving its normal path through the guider. (See Figure 2.)

Having described my invention, I claim:

1. In a cordage machine, the combination with mechanism for preparing sliver, of a guider for the latter, means operated by said mechanism for moving said guider through a circular path, and means for periodically changing the diameter of the circular path of said guider for the purpose specified.

2. In a cordage machine, the combination with mechanism for preparing sliver, of a guider for the latter, means operated by said mechanism for moving said guider through a circular path, and automatic means for periodically changing the diameter of the circular path of said guider for the purpose specified.

3. In a cordage machine, the combination with mechanism for preparing sliver, of a guider for the latter, a rotatable member operated by said mechanism, means connected between the latter and the guider to move it in a circular path, and automatic means carried by said rotatable member to periodically change the diameter of the circular path of said guider for the purpose specified.

4. In a cordage machine, the combination with mechanism for preparing sliver, of a guider for the latter, a rotatable member operated by said mechanism, a ball and socket connection between said rotatable member and the guider to move the latter through a circular path when said member is rotated, and indexing means carried by the rotatable member to automatically change the eccentricity of the ball and socket connection for the purpose specified.

5. In a cordage machine, the combination with mechanism for preparing sliver, of a guider for the latter, a horizontally rotatable member operated by said mechanism, a ball and socket connection between the rotatable member and the guider to move the latter through a circular path when said member is rotated, rotatable pin means carried by the rotatable member to change the eccentricity of the ball and socket connection, and a stationary element adapted to be engaged by the rotatable pin means, whereby the latter is periodically turned to change the eccentricity of the ball and socket connection for the purpose specified.

6. In a cordage machine, the combination with mechanism for preparing sliver, of a guider for the latter, a horizontally rotatable member operated by said mechanism, a ball and socket connection between the rotatable member and the guider to move the latter through a circular path when said member is rotated, a pair of meshed indexing gears carried by said rotatable member for changing the eccentricity of said ball and socket connection, horizontal pins on the hub of one of said gears, and a stationary finger in the path of movement of said pins for engagement thereby during the rotation of the gear-carrying member to change the eccentricity of the ball and socket connection between said member and the guider for the purpose specified.

7. In a cordage machine, the combination with mechanism for preparing sliver, a horizontally rotatable member operated by said mechanism, a fixed supporting socket, a rod having a ball surface between its ends, within said socket, a guider for said sliver, carried by the lower end of said rod, a horizontal gear eccentrically secured to the lower surface of said rotatable member, a ball and socket connection between the upper end of the rod and said gear, a second gear carried by the rotatable member in mesh with the first gear, horizontal pins on the hub of the second gear, and a stationary finger in the path of movement of said pins for engagement thereby during the rotation of the gear carrying member to change the eccentricity of the top ball and socket connection, for the purpose specified.

8. In a cordage machine, the combination with mechanism for preparing sliver, a horizontal gear operated by said mechanism, a fixed supporting socket, a rod having a ball surface between its ends, within said socket, a guider for the sliver, carried by the lower end of said rod, a horizontal gear eccentrically secured to the lower surface of the first gear, a plate eccentrically secured to the lower face of the second gear and formed with a socket, a ball on the upper end of the rod fitted in the last mentioned socket, a third horizontal gear secured to the lower surface of the first gear and in mesh with the second gear, projecting pins on the hub of the third gear, and a stationary finger in the path of movement of said pins for engagement thereby during the rotation of the first gear to change the eccentricity of the top ball and socket connection with respect to it for the purpose specified.

9. In a cordage machine, the combination with mechanism for preparing sliver, a horizontally rotatable member operated by said mechanism, a fixed supporting member, a rod pivotally secured between its ends to said supporting member, a guider for the sliver, carried by the lower end of the rod, and a variable eccentric connection between the upper end of said rod and the horizontally rotatable member, for the purpose specified.

10. In a cordage machine, the combination with mechanism for preparing sliver, a horizontal gear operated by said mechanism, a fixed supporting socket, a rod having a ball surface between its ends, within said socket, a pair of guide rollers for the sliver, below said gear, a supporting member secured at its upper end to the lower end of the rod and bent downwardly around said rollers, a guider spout for the sliver secured to the lower end of said supporting member, and a variable eccentric connection between the upper end of said rod and the horizontal gear for the purpose specified.

In testimony whereof I have hereunto set my hand this 10th day of May, 1930.

FREDERICK ENGEL.