Oct. 4, 1955 R. D. CARMICHAEL 2,719,338

COILERS FOR TEXTILE FIBERS

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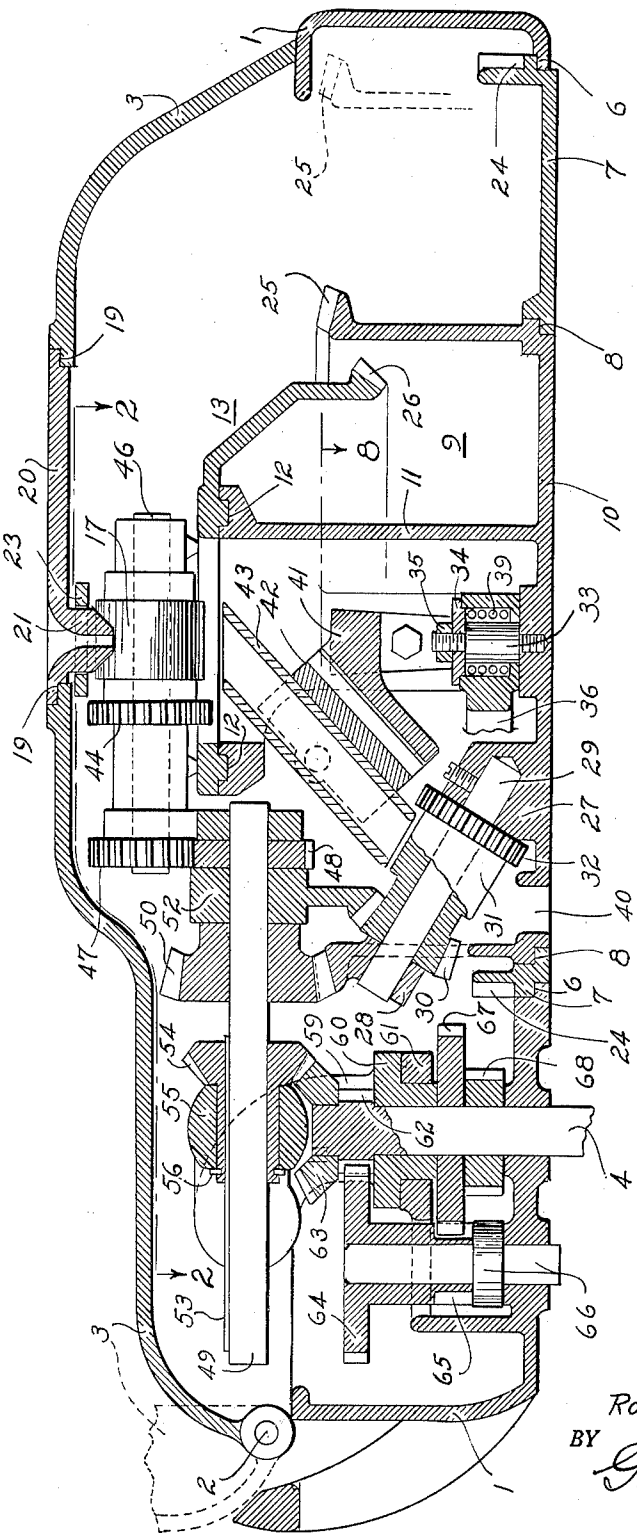


Fig. - 1

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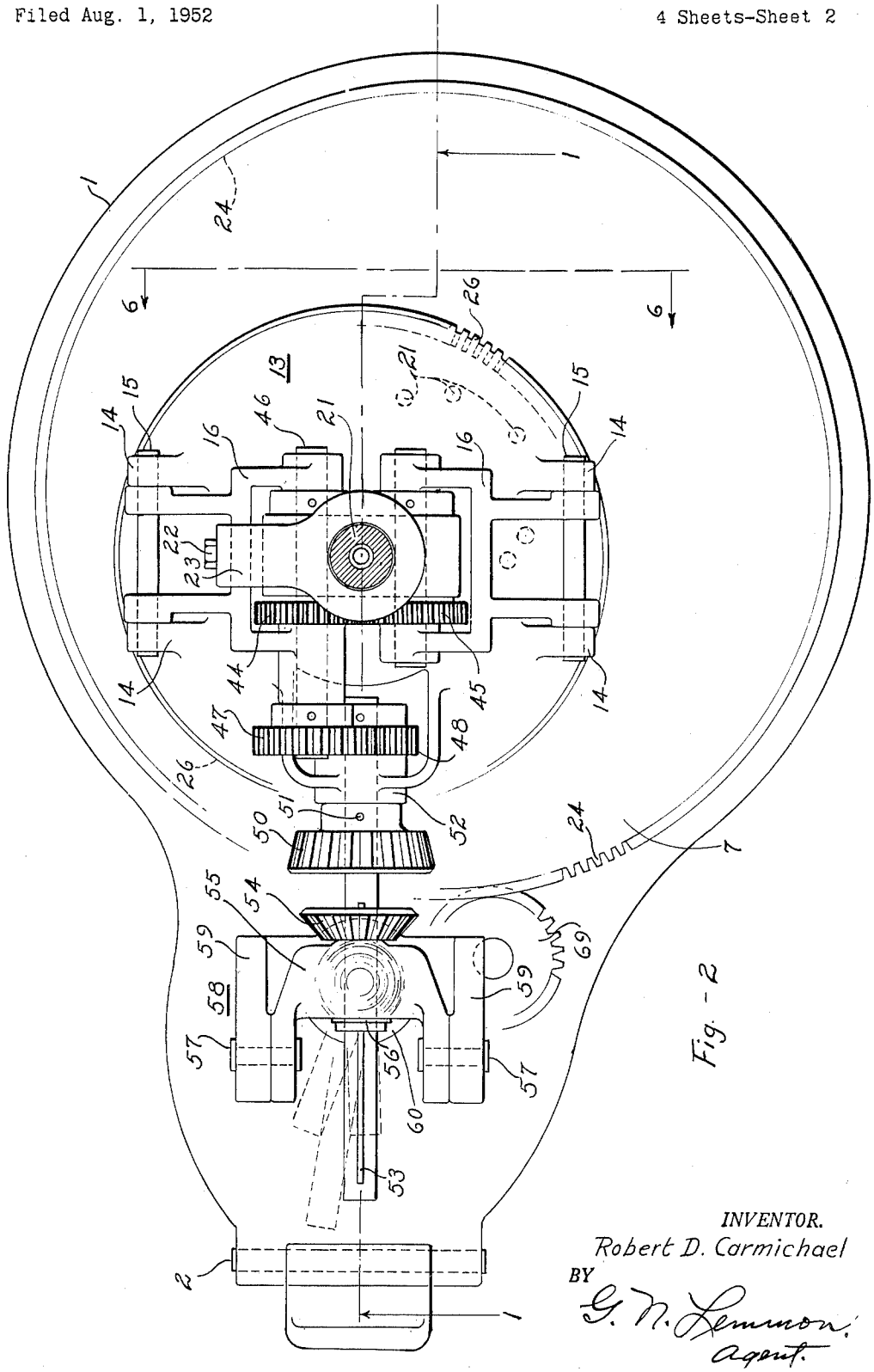


Fig. - 2

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COILERS FOR TEXTILE FIBERS

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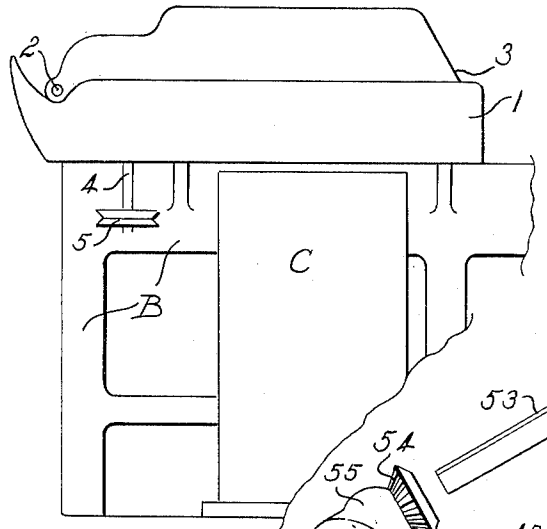


Fig. 3

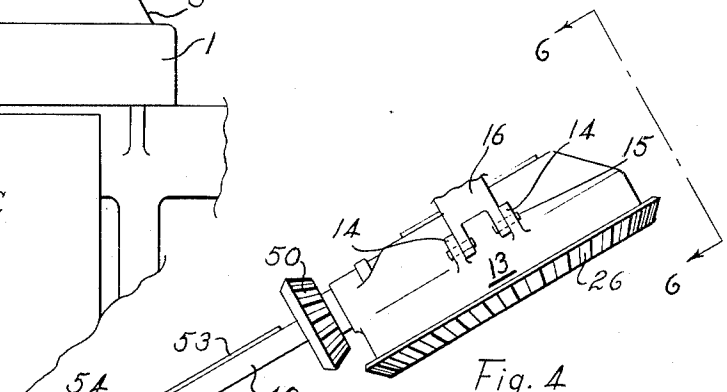


Fig. 4

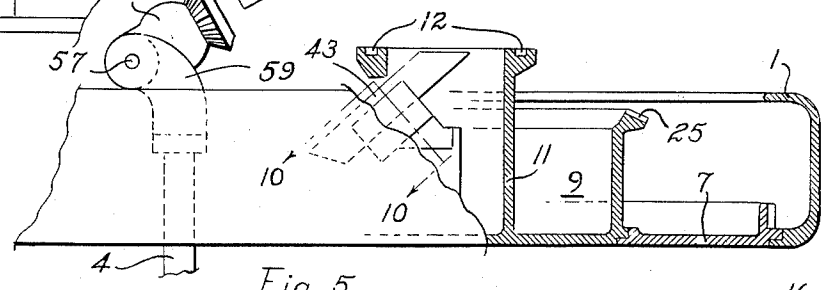


Fig. 5

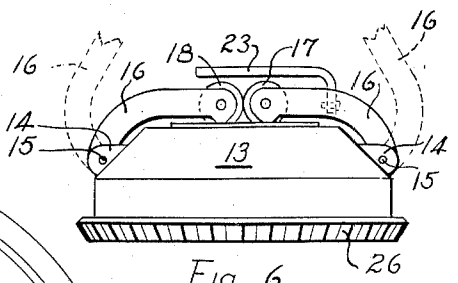


Fig. 6

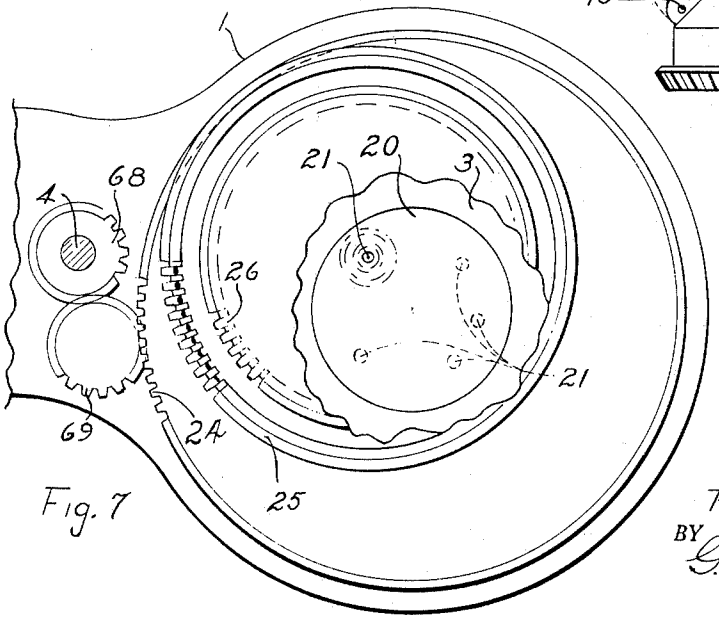


Fig. 7

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COILERS FOR TEXTILE FIBERS

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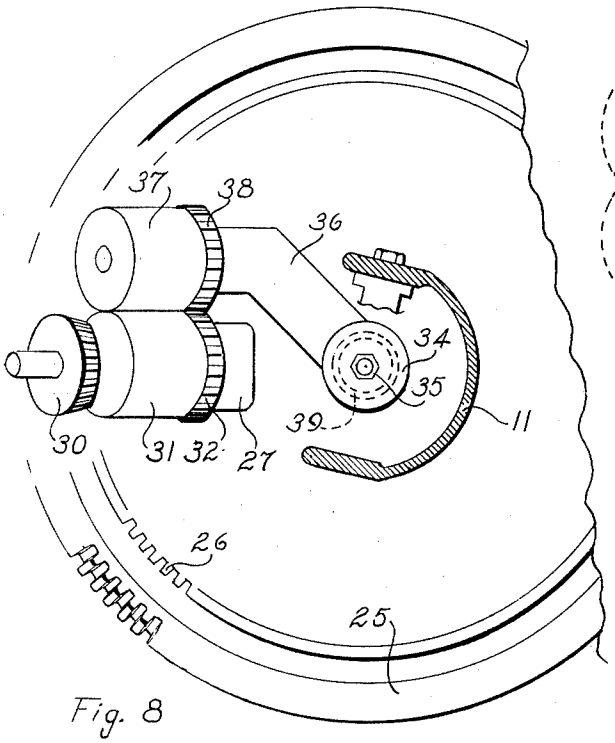


Fig. 8

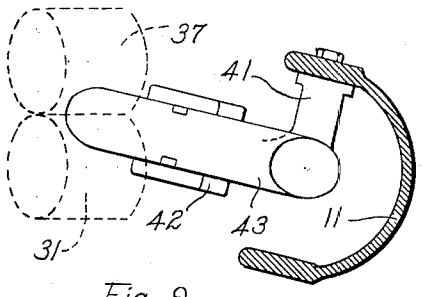


Fig. 9

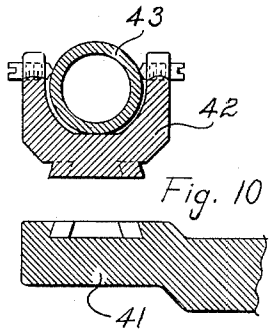


Fig. 10

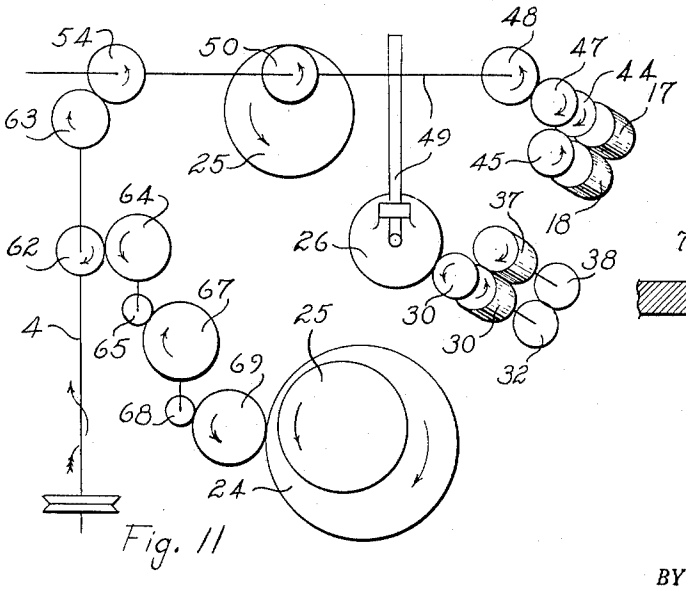


Fig. 11

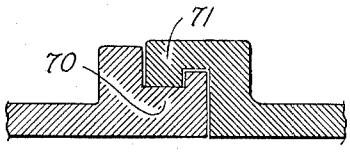


Fig. 12

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2,719,338

COILERS FOR TEXTILE FIBERS

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Application August 1, 1952, Serial No. 302,186

12 Claims. (Cl. 19—159)

This invention relates to processing of textile fibers, methods, and machinery whereby the filmy sliver is coiled in the desired manner inside the container can which receives it.

One purpose of the invention is to provide a coiler head which will coil the sliver as desired while the container can remains stationary; another purpose is to provide a mechanism as described which will also be adaptable for use with older machines already in use; another purpose is to provide a mechanism as above which in addition will allow the use of container cans of larger diameter than those now being used; and other purposes will be evident from the specification and claims.

To meet these purposes, this invention provides a movable feeder which discharges the sliver downwardly through a vent which continuously moves in a circle about its feeder center, and also provides a relatively slow rotator mechanism which causes the said feeder center to revolve slowly in a circle about the vertical center line of the container can, while the container can remains stationary. One form in which features of the invention may be embodied is disclosed in this specification and these drawings.

Referring to the drawings,

Figure 1 is a vertical cross-section through the center of the coiler head;

Figure 2 is a top plan view, with the cover removed;

Figure 3 in very small scale is a general view of a complete coiler head as installed for use;

Figures 4 and 5 in small scale show a coiler head partially disassembled;

Figure 6 is a view on the line 6—6 in Figure 4.

Figure 7 in the small scale is a composite plan view showing the relationship between the different vertical axes about which certain members are rotatable;

Figure 8 in small scale is a plan view of roller members on the line 8—8 in Figure 1;

Figure 9 is a plan view showing members which are just above those shown in Figure 8;

Figure 10 is an enlarged cross section on the line 10—10 in Figure 5, with the two members spaced apart.

Figure 11 is a diagram of the gearing system.

Figure 12 is an enlarged sectional view of an alternate type of supporting bearing which may be used if desired.

Referring to Figure 3, the coiler head 1, 2, 3 is secured by suitable means to the supporting frame which is indicated by B, and the container can C is properly positioned beneath the head but not touching it.

Figure 1 is a vertical sectional view through the centers of the drive shaft, the feeder, the outer support, and the main portion of the housing, as indicated by the line 1—1 in Figure 2. The housing base 1 carries hinge pin 2 on which is hinged housing cover 3. The vertical drive shaft 4 is journalled in base 1 for axial rotation and it is driven as by pulley 5, for which see Figure 3. The base 1 has at 6—6 a circular bearing groove in which rests the outer support 7, which may be in the form of a plate which also serves as a part of

the bottom of the housing. Eccentrically located in the outer support 7 is a smaller circular bearing groove 8—8 in which rests the cooperating ring of the feeder support 9. The bottom of feeder support 9 may be in the form of a bottom plate 10 which thereby cooperates with base 1 and outer support 7 to form a tight bottom for the completed housing.

The feeder support 9 also includes a semi-cylindrical upward extension 11 which supports a circular bearing groove 12 which is substantially above groove 8 and is vertically concentric with groove 8. In groove 12 rests the cooperating bearing ring of top cap 13, which is centered about the common axis of grooves 8 and 12. See also Figures 2, 5, 6 and 7. Integral with top cap 13 are two pairs of ears 14—14 which support the pins 15, 15, which pins carry the two top roller supports 16, 16 and thereby support the rollers 17, 18.

In the cover 3, concentric with bearing groove 6, is the circular bearing groove 19 in which rests the trumpet support 20; the trumpet 21 is preferably integral with support 20. The trumpet guide 23 is secured by bolt 22 to one of the roller supports 16. See plan view in Figure 2.

Integral with outer support 7 is the circular outer gear 24. Integral with feeder support 9 is a circular feeder gear 25, a bevel gear. Integral with top cap 13 is another bevel gear, top cap gear 26. Integral with feeder support 9 are journals 27 and 28 which support both ends of shaft 29. Shaft 29 is stationary and about it revolves the integral member which includes gear 30, roller 31 and gear 32. At the center of feeder support 9, double ended stud 33, collar 34 and nut 35 form a bearing about which arm 36 is rotatable; and arm 36 supports the unitary member which comprises roller 37 and gear 38 which rotate in coordination with roller 31 and gear 32. See also Figure 8. Arm 36 is biased counterclockwise by spring 39. Gear 30 engages with top cap gear 26, which last does not rotate.

Referring also to Figure 9, feeder support 9, through extension 11, arm 41 and guide block 42, also supports the tubular sliver guide 43 which is adjustably held in the desired position relative to feeder support 9. In the bottom of feeder support 9 is vent 40, which is just below the adjacent surfaces of the two bottom rollers 31, 37.

The feeder support 9, the top cap 13, the trumpet guide 23 and therefore the trumpet 21, are all concentric about the same vertical axis; therefore there is a continuous path for the sliver as follows: through the trumpet 21, between the top rollers 17, 18, which are adjusted to impart the desired pull to the sliver, into the sliver guide 43, out of the sliver guide, between the two bottom rollers 31, 37 which impart a further pull to the sliver, and so downwardly out through the vent 40.

To drive the top rollers 17, 18 they are interconnected by two similar gears 44, 45 which are integral with their respective rollers. See also Figure 2. Roller 17 is securely held to its shaft 46, to which is also secured gear 47, which engages with gear 48, which in turn is secured to the long shaft 49; and gear 50 is also secured to long shaft 49 by set screw 51. Shaft 49 is journalled in long shaft journal 52 which is an integral part of top cap 13. The long feather key 53 is fixed in the extended end of shaft 49, and a driving member in the form of bevel gear 54 slidably receives this portion of shaft 49 and key 53. Gear 54 is rotatably mounted by its long extension in bracket 55 and is held there by retainer 56. Bolts 57, 57 pivotally mount bracket 55 on bracket support 58 for vertical rocking movement. Support 58 includes ears 59, 59 and collar 60 and the parts which connect them. Collar 60 rests upon and is journalled in ring 61, as shown in Figure 1. Ring 61 is an integral part of base 1.

Collar 60 is also a journal which helps to support shaft 4.

Therefore top cap 13 and all members directly connected to it are movable in three ways: They may be rocked upwardly about the axis of bolts 57, 57; they may be moved horizontally sidewise about the axis of shaft 4; and/or they may be moved longitudinally by sliding long shaft 49 axially within the journal formed by the extension of gear 54. As indicated by the combination of Figures 4 and 5, top cap 13 and long shaft 49 also may be entirely separated from feeder support 9. The term feeder herein designates only those members which rapidly revolve with the vent 40. The top cap 13 and rollers 17, 18 are not so included.

Figures 4 and 5 in small scale show the main body of the coiler head, partially in section and with the cover removed, the long shaft 49 having been withdrawn from its journal inside bracket 55. When shaft 49 is replaced into this journal, top cap 13 may b lowered over the circular bearing groove 12 so that the bearing ring of cap 13 will be reengaged with the bearing groove 12, as shown in Figure 1.

Figure 6 in small scale shows the end view of top cap members from the line 6—6 in Figures 2 and 4. Dotted lines show the raised positions of roller supports 16, 16 when raised up from their normal positions of resting on top of cap 13. With their pivots 15, 15 well below the rollers 17, 18, these rollers will instantly be slightly separated and raised if an abnormal lump in the sliver should be drawn between the rolls. And when the lump shall have been discharged downwardly then the bias of gravity will again bring the rollers back to their normal close spacing.

Figure 7 in small scale is a composite plan view which shows the relationships between the different axes about which various members are rotatable.

Pinion gear 68, which is journalled about shaft 4, engages with and drives idler gear 69 which engages outer gear 24. This is concentric with the outside of base 1. Feeder gear 25 is above outer gear 24 and is so eccentric to it that at one place part of gear 25 is almost directly above a part of gear 24. Top cap gear 26 is concentric with gear 25 and it so remains, though gear 25 revolves rapidly and gear 26 does not revolve about its axis at all, for shaft 49 precludes this. The center of Figure 7 shows part of the cover 3 with the circular trumpet support 20 and the trumpet 21 rotatably supported thereon. The center of the trumpet support coincides with the axis of gear 24, and the hole in the trumpet 21 coincides with the common axis of gears 25, 26, for trumpet guide 23 is positioned about the vertical center of top cap 13. Therefore, as outer gear 24 slowly revolves, trumpet support 20 is slowly forced to rotate, and the trumpet slowly moves in a circle about the axis of gear 24. Some of these positions of trumpet 21 are indicated by small dotted circles. When the trumpet is at the position farthest from shaft 4, feeder gear 25 is at the place indicated by dotted lines at the right hand end of Figure 1.

Figure 8 is a broken plan view showing feeder gear 25 and other feeder members already described. It also shows part of top cap gear 26 which comes down on top of gear 30 and engages with it to drive gear 30 and bottom rollers 31, 37. Spring 39 lightly biases roller 37 against roller 31, allowing roller 37 to move if a lump of sliver comes between the two rollers.

Figure 9 is a plan view of the sliver guide 43 and its supports, showing its position relative to rollers 31 and 37.

Figure 10 is a large scale section of the sliver guide 43, the tube block 42, and part of the supporting arm 41, with the block 42 disassembled from its supporting wedge-shaped slot in arm 41. See line 10—10 in Figure 5.

Figure 11 is a diagram of the system of driving gears. It should be noted that gear 50 engages with feeder gear 25 to drive gear 25 counterclockwise, and idler gear 69 engages to turn outer gear 24 clockwise. But feeder gear 25 is supported upon the member which embodies outer gear 24. Therefore gear 25 appears in two places in the diagram. Also shaft 49 is shown as being journalled upon the member which includes top cap gear 26, and shaft 49 is also shown as being the shaft which supports gears 48, 50 and 54. Shaft 49 does have this dual function.

Figure 12 shows an interlocking type of bearing which may be used, if desired, in place of bearings shown at 6, 8, 12 and/or 19. In this design bearing groove 70 supports and interlocks with bearing ring 71.

When operating, power is applied through driving shaft 4 to pinion gear 62 and to bevel gear 63. See Figure 1. Gear 62 engages with spur gear 64 and thereby turns its pinion 65; these are rotatable about collared shaft 66. Gear 67 and its pinion 68 are journalled about shaft 4, gear 67 engages with pinion 65 and pinion 68 engages idler gear 69 which in turn engages outer gear 24. See Figure 7.

Bevel gear 63 engages with bevel gear 54, and thereby rotates shaft 49 to which is secured gear 50, which in turn engages with feeder gear 25 which is an integral part of feeder support 9. Thereby bevel gear 63 drives both the top rollers 17, 18 as described above, and also rotates feeder support 9 thirty or thirty-five times for each revolution of outer support 7.

Since shaft 49 prevents rotation of top cap 13, top cap gear 26 cannot rotate. Therefore, as feeder support 9 is rotated by engagement of gear 50 with feeder gear 25, gear 30 is rapidly rotated because of its engagement with cap gear 26. This causes bottom rollers 31, 37 to revolve rapidly and impart a supplementary pull to the sliver, to insure its continual motion downwardly and out through vent 40 in the desired pattern.

As shown in Figures 2 and 7, the center of the outer support, and therefore the center of the can, is farther from the supporting frame than are the drive shaft 4 and the feeder members when they are in the location indicated by Figure 2. This offset location of the can relative to the drive shaft makes possible the use of a larger can than could be used otherwise.

One familiar with the art could readily make changes in the system of gears here described, the arrangement and the number of rolls could be modified, and many other changes could be made without departing from the spirit and purpose of this invention.

I claim:

1. In a head for coiling a textile sliver, a housing which includes a base and a cover, a circular outer support rotatably supported by the base, a circular feeder support rotatably supported by the outer support and with its center spaced from the center of the outer support, a top cap normally disposed adjacent to said feeder support in substantially concentric relation thereto,, a trumpet to pass the sliver downwardly into the head, rollers rotatably supported by said top cap for drawing the sliver downwardly out of said trumpet, a vent in the feeder support to pass the sliver downwardly out of the head, and gear means within the head to revolve the feeder support rapidly and to revolve the outer support slowly.

2. A coiler head as in claim 1 in which the trumpet is supported by the cover and is movable in a circle about the axis of the outer support, and in which a guide holds the trumpet in alignment with the axis of the feeder support.

3. In a coiler head of the class described, a single drive shaft journalled in the head, a bracket support movably journalled about the drive shaft, a bracket pivotally supported by the bracket support, a movable top cap mounted in said head, and a long shaft with one end slidably passing through the bracket and with the other end fixedly journalled in said cap, the long shaft and the top cap thereby being movable in relation to the drive shaft up and down and in and out and also sidewise.

4. In a coiler head as in claim 3 in which the top cap carries a pair of top rolls to feed the sliver downwardly.

5. In a coiler head, a movable feeder support with a downwardly discharging vent, a pair of bottom rollers immediately above the vent, a trumpet mounted above the feeder support, a pair of top rollers immediately below the trumpet, and a sliver guide between the two pairs of rollers, these members thereby forming a continuous path for the sliver downwardly through the trumpet, between the top rollers, through the guide, between the bottom rollers, and downwardly out through the vent.

6. In a coiler head, a top cap pivotally mounted in said head, a bracket rotatable about a fixed axis, a long shaft with one end slidably passing through the bracket and with the other end fixedly journalled in said top cap, a circular gear formed near the outer edge of said top cap, a pair of top rollers mounted on top of said top cap, and gear means between the long shaft and the rollers whereby the rollers may be operated by rotation of the shaft.

7. In a coiler head, a base, a circular outer support movably mounted on the base, a feeder support mounted on the outer support, a pair of bottom rollers with gears mounted on the feeder support, a top cap normally in engagement with said feeder support and movable to a position out of engagement with said feeder support, a gear on the top cap and connected with the bottom rollers when said top cap is in engagement with said feeder support, and means to rotate the feeder support and thereby to operate the bottom rollers.

8. In a coiler head, a base, an outer support movably mounted on the base, a feeder support movably mounted on the outer support, a gear integral with the feeder support, a top cap mounted on the feeder support, a shaft having one end journalled in the top cap so as to prevent rotation of said top cap about its own axis, a gear secured to the shaft and engaged with the said gear of the feeder support, and means operably related with the other end of said shaft by a slidable connection to rotate the shaft and thereby to rotate the feeder support.

9. In a coiler head, a housing which includes a base and a cover, a rotatable outer support mounted on the base, a feeder support eccentrically mounted on the outer support and rotatable relative thereto, a top cap mounted on the feeder support, a top cap gear integral and substantially coaxial with the top cap, a bracket pivotally mounted in said head, a long shaft disposed transverse to the axis of said top gear and having one end journalled in the top cap and having the other end slidably journalled in said bracket, so as to accommodate transverse bodily movement of said top cap.

10. In a head for coiling a textile sliver, a housing which includes a base and a cover, a circular outer support rotatably supported by the base, a circular feeder support

rotatably supported by the outer support and with its center spaced from the center of the outer support, a top cap movably mounted in said head, a trumpet arranged to pass the sliver downwardly into the head, a trumpet guide mounted on said top cap in substantially symmetrical relation thereto, rollers rotatably supported by said top cap for drawing the sliver downwardly out of said trumpet, a vent in the feeder support to pass the sliver downwardly out of the head, and gear means within the head to revolve the feeder support rapidly and to revolve the outer support slowly.

11. In a coiler head, a base, an outer support movably mounted on the base, a feeder support movably mounted on the outer support, a gear integral with the feeder support, a top cap normally in engagement with said feeder support, a shaft having one end journalled in the top cap so as to prevent rotation of said top cap about its own axis, a gear secured to the shaft and engaged with said gear of the feeder support, means operably related with the other end of said shaft by a slidable connection to rotate the shaft and thereby to rotate the feeder support, and bracket means forming a pivotal mounting for said other end of said shaft so as to accommodate bodily movement of said top cap to a position out of engagement with said feeder support.

12. In a coiler head, a base, an outer support movably mounted on the base, a feeder support movably mounted on the outer support, a gear integral with the feeder support, a top cap normally in engagement with said feeder support, a shaft having one end journalled in said top cap so as to prevent rotation of said top cap about its own axis, a gear secured to the shaft and engaged with the said gear of the feeder support, a driving member slidably connected with the other end of said shaft, means for rotating said driving member thereby to rotate said shaft and said feeder support, and pivotally mounted bracket means forming a support for said driving member, said bracket means being arranged to accommodate bodily movement of said top cap into and out of engagement with said feeder support.

References Cited in the file of this patent

UNITED STATES PATENTS

5,337	Strange	Oct. 23, 1847
432,132	Francis	July 15, 1890

FOREIGN PATENTS

2,742	Great Britain	of 1870
10,106	Great Britain	of 1844
11,271	Great Britain	of 1846
498,331	Belgium	Jan. 15, 1951