

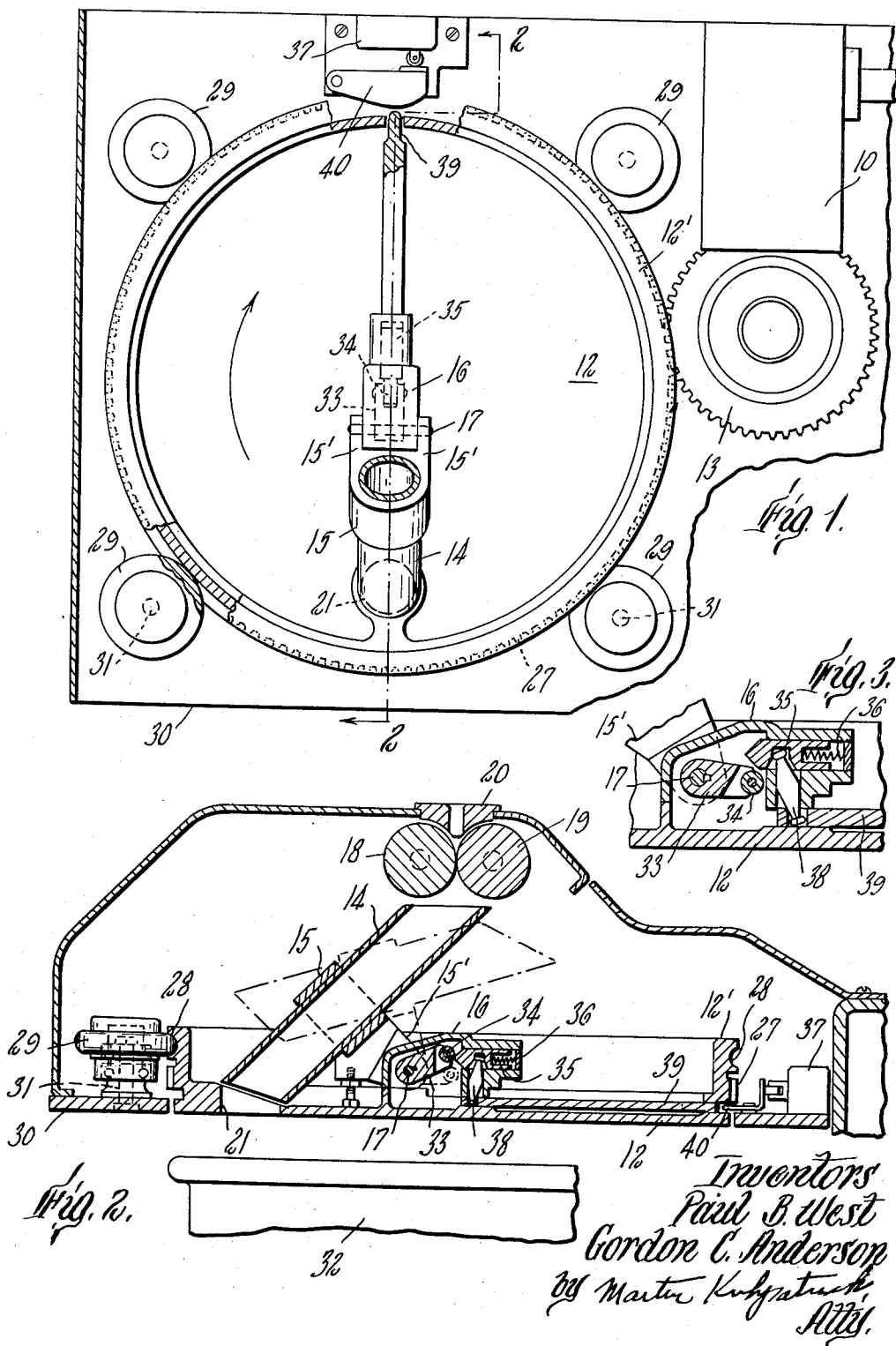
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## COILER MECHANISM

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## COILER MECHANISM

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This invention relates generally to textile machinery, and more particularly, it relates to an improved coiler mechanism whereby textile fibers in the form of a sliver are laid into a can.

In certain textile machines whose end products comprise textile fibers in sliver form, such as in a drawing frame for example, there is generally provided a coiler mechanism to deposit the sliver in a container or roving can as the final step in the machine operation. Conventionally, this coiler mechanism consists of a large gear which is rotated about a vertical axis and which carries for rotation therewith an inclined tube having its outlet end disposed above an orifice or passage through the gear, and its inlet end disposed beneath a pair of delivery rolls to feed the sliver to the tube. As the tube gear rotates, the sliver is conducted through the tube to the orifice formed in the gear whence it is deposited in overlapping coils.

Heretofore, the tube has been cast as an integral part of the coiler head, the latter being rigidly supported above the gear by means of a coiler plate. Although this arrangement has proven satisfactory in most respects, it does not permit ready access to the interior of the tube, particularly its delivery end, when the sliver becomes clogged therein as sometimes happens.

Also, there is generally included in the plate of a conventional coiler mechanism, a circular opening whereby the undersurface of the gear is exposed; and a circular groove or race adjacent the edge of the opening to receive a down-turned rim on the gear. Because of the heavy frictional drag which is occasioned by this mounting arrangement for the gear, most of the power necessary to drive the gear is wasted. Then too, lubrication of the race is required to prevent excessive wear and to lessen the frictional drag as much as possible, and such lubrication tends to pick up cotton fly.

It is an object of this invention, therefore, to provide a tube for a coiler mechanism which is adapted to be tilted away from the delivery rolls so as to facilitate removal of the sliver when the tube becomes clogged.

It is another object of the invention to provide a stop motion so that the operation of the coiler mechanism may be caused to cease automatically when the tube becomes clogged with the sliver.

It is still another object to provide a novel switch mechanism responsive to the above-mentioned stop motion.

It is a further object of the invention to provide an improved mounting arrangement for the tube gear which eliminates the need for lubrication and at the same time permits the tube gear to rotate much more freely so that considerably less driving power is required therefor.

The novel features of this invention, together with further objects and advantages thereof, will become more readily apparent from the following description of a preferred embodiment of the invention wherein reference will be had to the accompanying drawings. In the drawings:

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Fig. 1 is a plan view of the coiler mechanism in accordance with the present invention;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1; and

Fig. 3 is a view on an enlarged scale of a portion of the mechanism shown in Fig. 2.

With reference first to Figs. 1 and 2, it will be observed that the coiler mechanism of the present invention includes a tube gear 12 which is caused to rotate about a vertical axis by means of a pinion 13 mounted on the output shaft of a suitable speed reducing gear box 10. Affixed to the gear 12 is a housing 16 adapted to pivotally support an inclined tube 14. To this end, there is clamped to the tube 14, at an intermediate point lengthwise thereof, a collar member 15 which is provided with a yoke in the form of a pair of depending portions 15' astride the housing 16. A shaft 17, horizontally mounted by the housing and extending through the sides thereof for rigid attachment to the portions 15' serves to pivotally mount the collar 15 and hence the tube 14, as shown. As is conventional, a pair of delivery rolls 18 and 19 are disposed above the receiving end of the tube to draw the sliver through a trumpet 20, and disposed below the lower or outlet end of the tube there is an orifice 21 in the tube gear 12 from which the sliver is deposited.

With particular reference to Fig. 2, it will be observed further that gear 12 has an up-turned rim 12' which carries the gear teeth 27, and above the teeth there is a circumferential race or groove 28 having a smooth concave surface. Angularly spaced about the periphery of the gear are four circular rollers 29 having convex peripheral surfaces in rolling contact with the surface defining the groove. Rollers 29 are individually mounted for rotation independently of one another on vertically disposed stub shafts 31 affixed to a coiler plate 30. In this way, the gear is supported with its under surface substantially in the plane of the lower surface of the plate. A portion of a roving can 32 to collect the sliver issuing from the orifice 21 is shown beneath the gear 12, the under surface of the latter being exposed by the provision of a circular opening in the plate of diameter slightly larger than that of the gear itself, as is conventional. Roving can 32 is rotated at a somewhat lesser speed than gear 12, although the means whereby this is done have not been shown since they form no part of the present invention.

As shown in Figs. 2 and 3 there is keyed to shaft 17 interiorly of the housing 16 a pivotal lever 33, mounting at its end remote from the shaft a roller 34. When the tube 14 is in its normal position with its receiving end beneath the delivery rolls 18 and 19, roller 34 is engaged by a plunger 35 which is slidably mounted in the housing 16 and urged towards the roller by a compression spring 36. The end of plunger 35 is contact with roller 34 is formed with blade-like edges, and the upper edge, as shown in Fig. 2, rides under the roller. In this way, an over-center device having a toggle-like action is provided which maintains the tube 14 in its normal position under normal operating conditions.

Should the sliver become clogged in the tube, however, the force fed pile-up of sliver at the receiving end of the tube causes the tube to tilt or pivot about the axis of shaft 17 so that the roller 34 rides over the leftward extremity of the plunger 35, thereby passing over center. As shown in Fig. 3, this frees the plunger, permitting movement thereof to the left, under the influence of spring 36, whereby an electrical switch 37 is actuated.

In particular, there is provided for the actuation of switch 37, a pin 38 and a second relatively longer plunger 39, constrained to move along a radius of the gear 12, between a first position wherein one of its extremities is disposed radially inwardly of the periphery of the gear

(Fig. 2), and a second position wherein this extremity is moved radially beyond the periphery of the gear in response to the leftward movement of plunger 35, reflecting a predetermined amount of tilting movement of the tube 14. The intermediate portion of the pin 38 fits loosely in a bore provided for the purpose in a portion of the housing assembly, and the ends of the pin are retained in bores in the respective plungers. As shown, pin 38 is doubly tapered, that is, larger at its center than at either of its ends whereby rounded nub-like portions are formed. Since the aforementioned housing portion is fixed, an effective fulcrum is provided for the intermediate portion of the pin so that as the plunger 35 moves toward the left, plunger 39 which is slidably mounted on the gear 12, is moved by the pin toward the right. As aforementioned, the rightward extremity of plunger 39 is thus caused to project beyond the periphery of the gear 12, where a pivotally mounted rocker arm 40 is provided for engagement therewith when the gear 12 rotates the plunger into an angular position adjacent the rocker arm. The rocker arm, in turn, is contoured with a cam-like surface adjacent the gear 12 such that as the plunger 39 continues to rotate, the rocker arm is pivoted away from the gear by the plunger 39, depressing the roller-type actuating arm of switch 37, sufficiently to actuate the switch.

It follows that in combination with the tilting mechanism for the tube, there has been provided a novel switch mechanism which is actuated automatically by the tilting movement of the tube when the sliver becomes clogged therein. The switch may be employed to stop the coiler mechanism, or simply to energize an alarm device, either of which functions may be provided for relatively easily by those skilled in the art. No doubt various modifications of the above-described embodiment that are within the spirit and scope of the invention will occur to those skilled in the art and therefore what is claimed is:

1. In a coiler mechanism for a sliver including a pair of delivery rolls to advance the sliver and a tube gear with an orifice therein to deposit the sliver in a coil, the combination with said rolls and said gear of an inclined tube to conduct the sliver from a point beneath the rolls to the orifice, and means to mount the tube both for rotation with said gear and tilting movement in a substantially vertical plane independently thereof.

2. In a coiler mechanism for a sliver including a pair of delivery rolls to advance the sliver and a tube gear with an orifice therein to deposit the sliver in a coil, the combination with said rolls and said gear of an inclined tube to conduct the sliver from a point beneath the rolls to the orifice, means to mount the tube both for rotation with said gear and tilting movement in a vertical plane independently thereof, and means to cause the coiler mechanism to cease operating in response to such tilting movement.

3. In a coiler mechanism for a sliver including a pair of delivery rolls to advance the sliver and a tube gear

with an orifice therein to deposit the sliver in a coil, the combination with said rolls and said gear of an inclined tube to conduct the sliver from a point beneath the rolls to the orifice, mounting means affixed to said gear, a collar member attached to the tube at an intermediate point lengthwise thereof, said collar member being pivotally connected to said mounting means for pivotal movement about a substantially horizontal axis permitting the tube to tilt when the sliver becomes clogged therein, and means to cause the coiler mechanism to cease operating in response to such tilting movement.

4. The combination according to claim 3 wherein said last-named means comprises an electrical switch mounted in fixed position adjacent the tube gear, and a mechanism to actuate said switch through the combined pivotal movement of the tube and rotational movement of the gear.

5. The combination according to claim 4 wherein said switch actuating mechanism includes an over-center device to permit tilting movement of the tube only in response to an abnormal force thereon such as is occasioned by the force fed pile-up of sliver at the receiving end of the tube.

6. In a coiler mechanism for a sliver including a pair of delivery rolls to advance the sliver and a tube gear with an orifice therein to deposit the sliver in a coil, the combination with said rolls and said gear of an inclined tube to conduct the sliver from a point beneath the rolls to the orifice, means to mount the tube both for rotation with said gear and tilting movement in a substantially vertical plane independently thereof, a slidable element operatively connected to said tube, said slidable element being constrained to move along a radius of said gear between a first position wherein one of its extremities is positioned radially inwardly of the periphery of said gear and a second position wherein said extremity projects radially beyond the periphery of said gear in response to a predetermined amount of tilting movement of said tube, and an electrical switch mounted in fixed position adjacent the periphery of said gear for actuation by said slidable element when in said second position.

7. The combination according to claim 6 wherein said mounting means for the tube comprises a collar member rigidly fastened to said tube and a pivot shaft mounted for rotation on said gear and being rigidly connected to said collar member, and said combination includes an over-center device operatively connecting said pivot shaft to said slidable element.

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