April 19, 1966 TAKUZO TOOKA 3,246,371

APPARATUS FOR CUTTING SLIVER AT THE TIME OF CAN CHANGING OPERATION

Filed April 26, 1963 2 Sheets-Sheet 1

FIG. 1

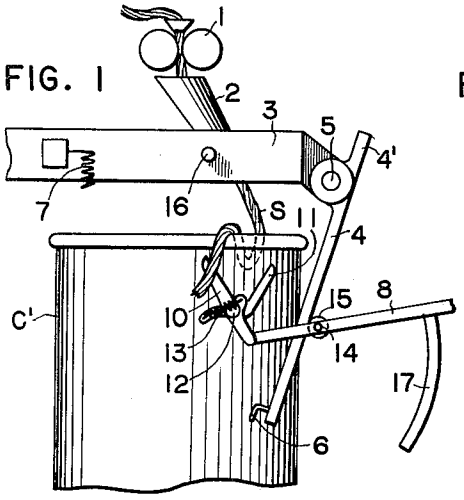


FIG. 2

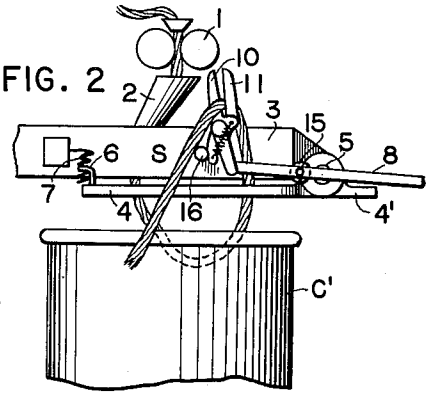


FIG. 3

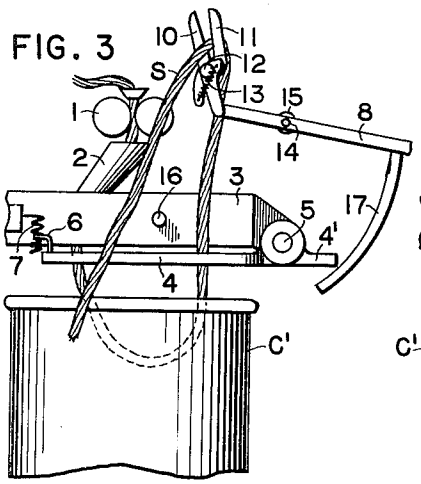


FIG. 4

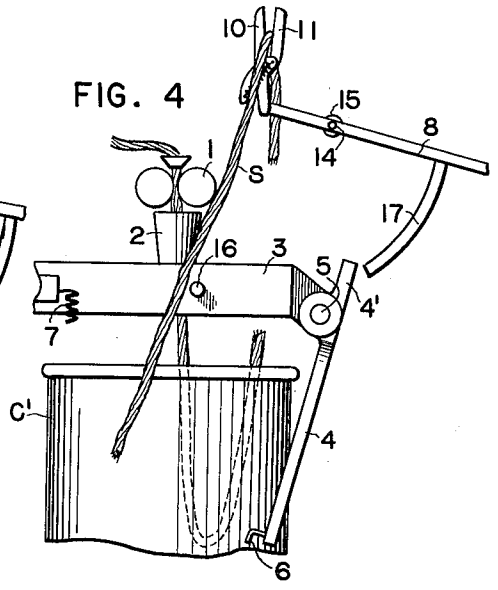
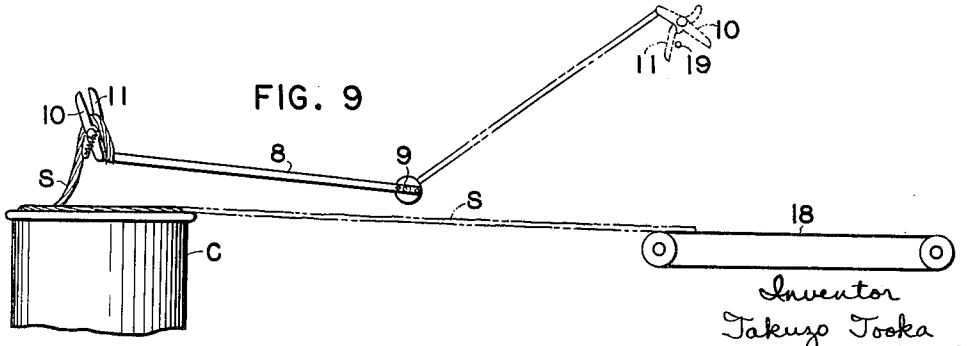


FIG. 9



Inventor
Takuzo Tooka
By Wenderoth, Lind, and Ponack, Attorneys

April 19, 1966 TAKUZO TOOKA 3,246,371

APPARATUS FOR CUTTING SLIVER AT THE TIME OF CAN CHANGING OPERATION

Filed April 26, 1963 2 Sheets-Sheet 2

FIG. 5

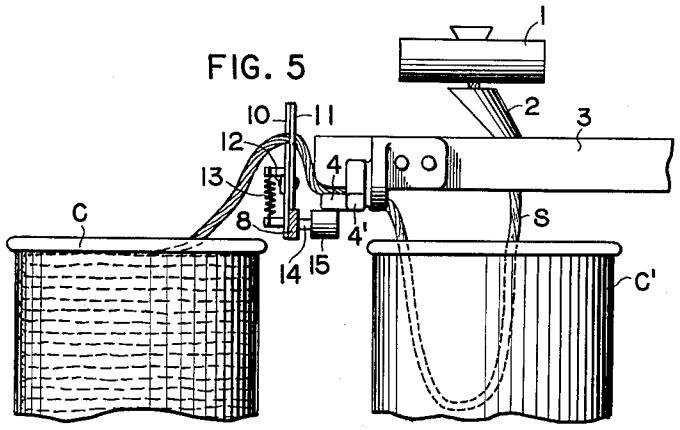


FIG. 6

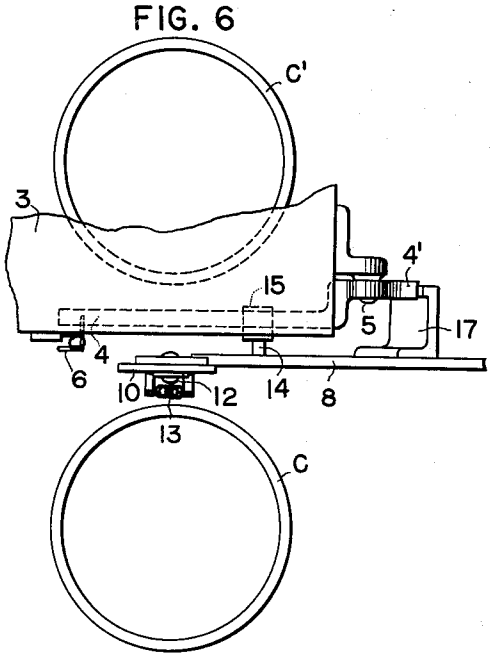


FIG. 7

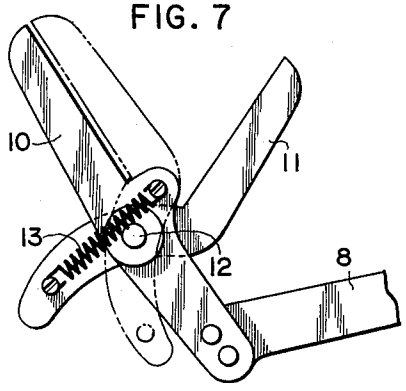
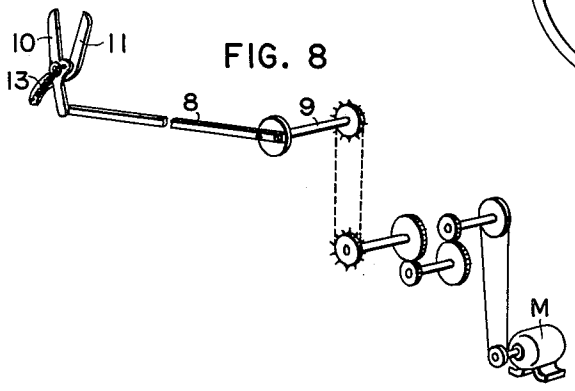


FIG. 8



Inventor
Takuzo Tooka
By Wenderoth, Lind, and Ponack,
Attorneys

United States Patent Office 3,246,371 Patented Apr. 19, 1966

3,246,371

APPARATUS FOR CUTTING SLIVER AT THE TIME OF CAN CHANGING OPERATION

Takuzo Tooka, Kariya, Japan, assignor to Toyoda Automatic Loom Works, Limited, Kariya, Japan

Filed Apr. 26, 1963, Ser. No. 275,963
4 Claims. (Cl. 19—159)

This invention relates to an apparatus for severing a sliver between a can filled with sliver and an empty can at the time of a can changing operation, particularly in an automatic continuous spinning system comprising a plurality of textile machines such as drawing frames.

The object of this invention is to provide an automatic apparatus for severing a sliver which extends between the filled up can and the empty can, which is simple in construction and reliable in operation, so that the can changing operation may be effected without any hindrance. Other and further objects of the invention will be obvious from the illustrated embodiment about to be described, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

The apparatus according to this invention comprises a pressure lever pivoted to a rigid part such as a coiler plate of a coiler device and adapted to press the sliver against said rigid part, an oscillatable long lever carrying at its free end a sliver nipper consisting of two pivoted arms, means for swinging said longer lever upwardly, and means for closing said two-armed sliver nipper during the upward movement thereof to nip the sliver at a point apart from the point of the sliver nipped by said presser lever, the arrangement being such that the sliver is severed by tension at a point between said two nipping points caused by further upward movement of the nipper carried by the long lever.

In the accompanying drawings there is illustrated one embodiment of this invention:

FIGURE 1 is a side view of an apparatus constructed according to this invention, showing the positions of the parts thereof immediately after the can changing operation;

FIGURE 2 is a similar view showing the positions of the parts when one portion of the sliver has been pressed against a fixed part and another portion of the sliver has been caught by an upwardly moving sliver nipper;

FIGURE 3 is another similar view showing the positions of the parts when said sliver nipper is moved upwardly further to stretch the sliver immediately before the severing takes place;

FIGURE 4 is still another similar view showing the positions of the parts when the sliver has been severed and the sliver end from the coiler has been dropped into the empty can;

FIGURE 5 is a front view of the apparatus in the position of FIG. 2;

FIGURE 6 is a plan view of the apparatus in the FIG. 2 position;

FIGURE 7 is an enlarged view showing in detail a sliver nipper;

FIGURE 8 is a schematic perspective view showing a driving system; and

FIGURE 9 is a diagrammatic view of the apparatus as operated for feeding the sliver from the full can to next drawing frame subsequent to the sliver severing.

Referring to the drawing, the reference numeral 1 designates calender rollers of a drawing frame, 2 a coiler tube, and 3 is a coiler plate. C and C' are sliver cans, one of which is located at the receiving position beneath the said coiler device while being filled with the sliver S from the coiler and the other is located behind said

can in the receiving position. It is to be understood that when the can C is filled up the other empty can C' is moved forwardly by means of a suitable device (not shown) to take the place of the filled can C, and the continuous sliver extends between the filled up can C and the empty can C'.

The coiler plate 3 is provided with a presser lever 4 pivoted as at 5 and having at its free end a hook 6 adapted to be engaged by a presser lever retaining means in the form of a spring 7 on the coiler plate 3. A long oscillatable lever 8 fixed to a rotatable shaft 9 has on its free end a plier-like or two-armed sliver nipper shown in detail in FIG. 7. One arm 10 of said nipper is fixed to the lever 8, while the other arm 11 is pivotably mounted at 12 to said fixed arm, and said two arms are connected by a spring 13 as shown in FIG. 7. The shaft 9 (FIG. 8) is rotated by a reversible motor M which is controlled by a suitable limit switch, through a suitable transmission gear train, so that the long lever 8 carrying the sliver nipper is adapted to be oscillated around the shaft 9.

The lever 8 has a horizontal stud 14 carrying an antifriction roller 15 adapted to engage with the presser lever 4.

When the can C is full of the sliver it is moved out of the sliver receiving position and in place thereof the empty can C' is brought beneath the coiler plate 3 at which point the parts are in positions shown in FIG. 1. The long lever 8 is swung upwardly. Then the roller 15 contacting with and sliding along the lever 4 will raise the latter lever, and thereby the lever 4 will catch the sliver S which extends between the cans C and C' and press the same against the lower surface of the coiler plate 3 as shown in FIGS. 2, 5 and 6. The spring 7 catches the hook 6 so as to hold the lever 4 in said position, while the long lever 8 is allowed to continue further in its upward swinging movement. For such purpose, a suitable means (not shown) may be provided to release the engagement of the roller 15 from the lever 4 by shifting the long lever 8 laterally of its length (i.e. upwardly out of the plane of the drawing). During the upward movement of the lever 8, the lower end of the pivoted arm 11 of the nipper is acted upon by a projection 16 on the coiler plate 3, whereby the nipper is closed and the sliver is nipped thereby. Thus, upon further upward movement of the lever 8, the sliver will be excessively tensioned, as shown in FIG. 3, and severed at a point between the nip point of the lever 4 and the nip point of the nipper arms 10 and 11 as shown in FIG. 4. Immediately after the sliver has been severed in the above manner, upon further upward movement of the lever 8 an actuating arm 17 fixed to the long lever 8 will co-operate with a rear extension 4' of the lever 4, as shown in FIGS. 3 and 4, so that the lever 4 will be swung downwardly to its initial position, and the severed sliver end will be dropped into the empty can C'. When the long lever 8 is moved downwardly by reversed rotation of the motor M, the nipper is opened to release the nipped sliver end extending from the filled up can C. Any suitable means may be provided to open the nipper when it returns toward the initial position. In addition, when the long lever 8 reaches the position in which the roller 15 is adjacent the now downwardly hanging lever 4, it is again moved laterally by the same means as moved it laterally on the upswing. In this manner the roller 15 is again positioned behind the lever 4 in the FIG. 1 position.

It is to be understood that the apparatus of this invention may, if desired, be used for feeding the sliver from the filled up can to a feed table or conveyor for the next drawing frame. In this case, instead of reversing the movement of the long lever 8 carrying the nipper

immediately after completing the severing of the sliver, said lever **8** with the severed sliver end nipped by the closed nipper is rotated further in the clockwise direction (as seen in FIG. 9) passing through the vertical plane for a substantial angle to bring the nipper over the feed table or conveyor **18** for the next drawing frame (not shown), as shown in FIG. 9, and the nipper is opened by being acted upon by a fixed stop **19** so as to release the sliver end which falls down onto the conveyor **18**.

What we claim is:

1. An apparatus for severing a sliver when a can changing operation has taken place in a textile machine, said apparatus comprising a presser lever adapted to be pivoted to a rigid part of a coiler device on the textile machine, a long oscillatable lever having a free end, a sliver nipper on said free end comprising two relatively pivotable arms, means coupled to said long lever for swinging said long lever upwardly across the path along which the sliver extends from a full can to an empty can, means on said long lever engaging said presser lever to swing said presser lever so as to nip the sliver between the presser lever and the rigid part, and means for closing said two-armed sliver nipper during the upward movement of the long lever for nipping the sliver at a point spaced from the point at which it is nipped between the presser lever and the rigid part, whereby the sliver is severed by tension between the two nip points during the further upward movement of said long lever.

2. An apparatus as claimed in claim **1** in which said means engaging said presser lever comprises a roller on said long lever engageable with said presser lever during the upward swinging movement of said long lever.

3. An apparatus as claimed in claim **2** further comprising a presser lever retaining means adapted to be mounted on said rigid part, and an extension on said long lever engagable with said presser lever on the opposite side of the pivotal mounting thereof from said retaining means after the sliver has been severed for pivoting said presser lever downwardly and releasing it from said retaining means.

4. An apparatus as claimed in claim **1** in which said long lever is pivoted at a pivot point about which it is oscillatable, said means for swinging said long lever includes means for continuing the swing of said long lever through a vertical line through the pivot point of said long lever, and sliver nipper opening means positioned adjacent the path of movement of the sliver nipper at said point past the vertical line through the pivot point of said long lever for opening the arms of said sliver nipper, whereby the sliver can be released for feeding to a conveyor or the like for a further textile machine.

References Cited by the Examiner

UNITED STATES PATENTS

3,083,415 4/1963 Osaki et al. ---------- 19—159

DONALD W. PARKER, *Primary Examiner.*