Oct. 19, 1971 F. SCHUMANN ET AL 3,613,175

METHOD FOR INDUCING PARTING OF FIBER SLIVER BETWEEN A CAN CONTAINER-FILLING DEVICE AND A CONTAINER

Original Filed Dec. 11, 1967 2 Sheets-Sheet 1

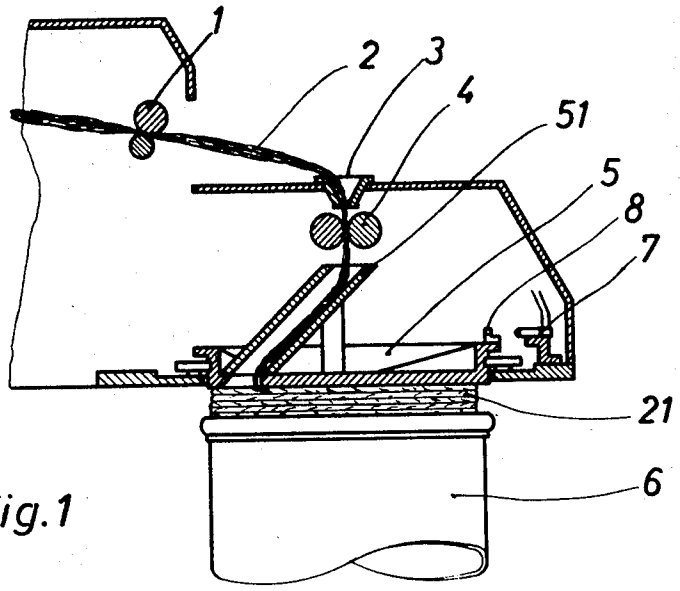

Fig. 1

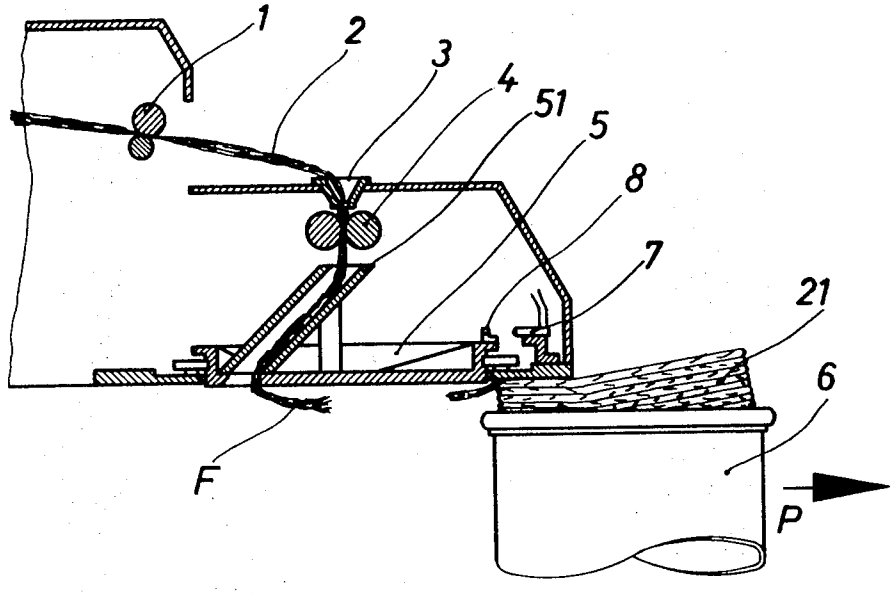

Fig. 2

INVENTORS
FRITZ SCHUMANN
ERICH EDLER

BY

Robert W. Beach

ATTORNEY

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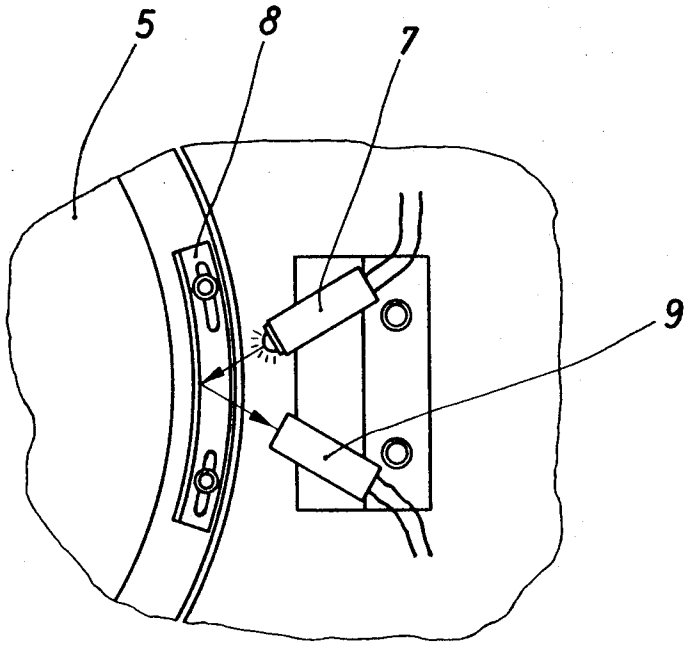

Fig. 3

INVENTORS
FRITZ SCHUMANN
ERICH EDLER
BY Robert W. Beach
ATTORNEY

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METHOD FOR INDUCING PARTING OF FIBER SLIVER BETWEEN A CONTAINER-FILLING DEVICE AND A CONTAINER

Fritz Schumann, Ingolstadt, and Erich Edler, Zuchering B., Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Continuation of application Ser. No. 698,458, Dec. 11, 1967. This application Nov. 3, 1969, Ser. No. 871,637
Claims priority, application Germany, Dec. 17, 1966, Sch 39,983
Int. Cl. B65h 54/80
U.S. Cl. 19—157 1 Claim

ABSTRACT OF THE DISCLOSURE

Fiber sliver is fed in a known manner into a container through an inclined tube carried by a rotary wheel with its upper inlet end in registry with the axis of the wheel and its lower outlet end offset from the wheel's axis so that the sliver is discharged helically into the container beneath the tube. After the container is filled, rotation of the wheel is stopped in response to actuation of photoelectric sensing means in a rotative position in which the tube is inclined downwardly away from a predetermined established direction in which the container is to be pulled from the filling machine transversely of the wheel's axis. A sharp return bend is formed in the sliver by its being pulled against the side of the tube as the container is moved outward with the sliver held in it, so that further container movement pulls the sliver apart at a location between the tube and the coil in the container.

This application is a continuation of application Ser. No. 698,458, filed Dec. 11, 1967, now abandoned, for Method and Apparatus for Inducing Parting Fiber Sliver Between a Container-filling Device and a Container.

In preparation for use in high output spinning machines, upon completion of carding, fiber sliver is coiled in cylindrical containers in a known manner. After a predetermined length of sliver is deposited in a container, the full container is manually or automatically removed from beneath the filling device and replaced by an empty container. During such interchange of containers the continuous sliver must be separated between the two containers.

Usually the sliver is fed through a funnel and calender rolls into a guide tube through which the sliver passes into the top of the container. The tube is rotated to coil the sliver as it drops into the container. When a metered length of sliver has been fed to the container, the rotational speed of the guide tube is decreased in preparation for removing the filled container from and supplying an empty container to the container-filling machine. Previously the sliver has been parted by stopping the calender rolls for a short time while the guide tube continues to rotate so that the sliver is parted adjacent to the feed end of the tube. Alternatively, the calender rolls may be reversed while the guide tube is stopped to effect the separation at a similar location. Another method of parting the sliver is to clamp the sliver in the funnel preceding the calender rolls and to move the funnel slightly away from the calender rolls. In this instance, the sliver is parted between the funnel and rolls.

Each of these methods of parting the sliver has the disadvantage that the frayed end of the sliver must be pushed through the guide tube to begin filling a subsequent container. Because the sliver is a strand of loosely assembled fibers, the individual fibers at the parted end of the sliver tend to fan out. The spread ends of the

fibers tend to adhere to the walls of the guide tube and therefore hinder threading of the sliver through the tube so that the sliver frequently piles up in the tube. Since there is no positive control of the sliver after it passes between the calender rolls, such piling of the sliver in the tube interrupts the filling operation and, if not detected promptly, continued operation of the filler may result in damage to the machine.

It is a principal object of the present invention to provide a method for controlling the sliver in the container filling device so that when a container is filled the sliver will be parted at a location between the discharge end of the guide tube and the rim of the filled container by withdrawal of the container from the container-filling device and thereby eliminate the problem of threading a frayed sliver end through the guide tube at frequent intervals.

FIG. 1 is a fragmentary side elevation of sliver container-filling apparatus with parts in section and FIG. 2 is a similar view with the container in a different position.

FIG. 3 is a fragmentary plan of control mechanism for the container-filling apparatus on an enlarged scale.

A sliver **2** of loosely assembled fibers is advanced by supply rolls **1** through funnel **3**, calender rolls **4** and guide tube **51** into a container **6**. The discharge end of guide tube **51** is carried on a turntable or wheel **5** overlying the upper open end of container **6**, such wheel having an aperture through it in registry with the guide tube discharge end. The infeed end of tube **51** is in underlying registry with the nip of calender rolls **4**, which nip is in alignment with the rotative axis of wheel **5**. The axis of guide tube **51** is inclined downwardly from its feed end and outward relative to the axis of the wheel so that its discharge end is offset from and rotates orbitally about such axis and preferably is located adjacent to the wheel's periphery. Rotation of the wheel causes the sliver to be discharged from the lower end of the guide tube in a helical path which effects coiling of the sliver in the container.

After a metered length of sliver is fed to the container, supply rolls **1**, calender rolls **4** and wheel **5** are stopped momentarily while the filled container is moved in the established direction of arrow P in FIG. 2 out of registry with the wheel and is replaced by an empty container.

In accordance with the present invention, the turntable **5** is stopped in a position such that the guide tube is inclined downwardly in a direction diametrically opposite to a predetermined established direction of container withdrawal movement extending transversely of the axis of turntable rotation so that the sliver forms a sharp return bend between the guide tube and the container rim. The coiled sliver **21** extends slightly above the container rim and is held down firmly by the lower surface of the wheel and its adjacent housing so that it cannot run out of the container. Consequently, the sliver is restrained by the tube **51** and/or wheel **5** at the location of the return bend and the top coil in the container is held by contact with the lower surface of the wheel so that outward movement of the container in the established direction indicated by the arrow in FIG. 2 will cause the coil **21** to be separated from the portion of sliver **2** within tube **51** by parting of the connecting sliver portion F at a location between the guide tube discharge end and the container rim.

The control mechanism for stopping wheel **5** with the guide tube disposed in the proper position of FIGS. 1 and 2 may be mechanically, electrically or optically actuated, but the photoelectrically operated control shown particularly in FIG. 3 is especially advantageous. The turntable **5** is shown as having an upstanding peripheral flange on which is carried an arcuate reflector **8** extend-

ing along a minor portion of the wheel circumference. Mounted on the stationary machine housing and constituting part of stationary means of the control means is a lamp or other light source **7** disposed so that its light beam strikes movable reflector **8**, constituting a coacting movable means of the control means when the wheel is in such rotative position as to locate the reflector adjacent to the lamp. Such beam is reflected to strike a photoelectric cell **9** constituting another part of the stationary means of the control means, thereby effecting an electrical impulse which actuates an electric brake or other suitable electrically-controlled wheel-stopping device to stop the wheel quickly. Reflector **8** is positioned on the wheel at a location such that the braking or stopping operation will stop the wheel in the position of FIG. 2 in which the guide tube **51** is inclined downwardly substantially opposite to the established direction in which the container is to be withdrawn outwardly from the container-filling machine. The reflector is shown in FIG. 3 to be an arcuate member of angle cross section having an upstanding reflector flange and a horizontal mounting flange. The mounting flange is provided with arcuate slots through which mounting bolts extend. Such slots enable the reflector to be shifted circumferentially of the wheel for adjustment.

Conventionally, the speed of rollers **1** and **4** and turntable **5** is reduced by control mechanism actuated in response to passage of a metered length of sliver **2** to or through the container-filling machine which has fed such length of sliver to the container. Lamp **7** may be energized simultaneously with such reduction in speed by actuation of such control mechanism, or in response to such reduction of machine speed, to effect operation of the braking mechanism.

Other devices for actuating conventional braking or stopping mechanism for wheel **5** could be used in place of the photoelectric actuation of the wheel brake or stopping mechanism while still including the combination of movable means coacting with stationary means, such as for example, a cam lobe on the wheel in place of the reflector, constituting the movable means of the control

means, engageable with a cam follower switch arm in place of the light source and photoelectric cell, constituting stationary means of the control means, to close a brake-control electric circuit.

We claim:

1. The method of parting a continuous fiber sliver passing from the discharge outlet of a container-filling machine inclined guide rotatable about an axis to a sliver-receiving container, which comprises establishing a predetermined direction of container-withdrawal movement extending transversely of the axis of guide rotation, automatically stopping the container-filling machine inclined guide rotation so as to stop the guide consistently, after the container is filled, in a position in which in every instance the guide slopes downward in a direction substantially opposite to the established direction of container-withdrawal movement and thereby assuring formation of a return bend in the sliver between the portion of the sliver extending through the inclined guide and the portion of the sliver extending from the guide toward the container as the container is moved relative to the guide in the established direction of container-withdrawal movement, moving the container away from the guide in such established direction of container-withdrawal movement, and restraining lengthwise movement of the sliver both relative to the guide and relative to the container during such container movement and thereby parting the sliver substantially at its return bend.

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DORSEY NEWTON, Primary Examiner

U.S. Cl. X.R.

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