Sept. 3, 1963 SEISAKU HANEDA ETAL 3,102,305

SLIVER LET OFF DEVICE OF A CARDING MACHINE

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Fig. 1

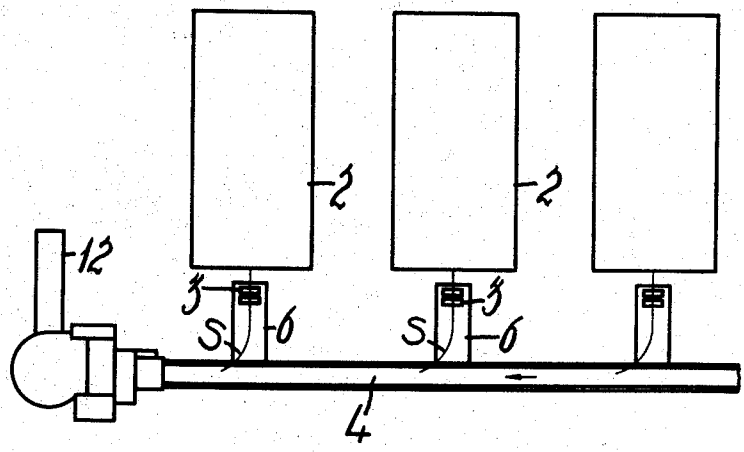
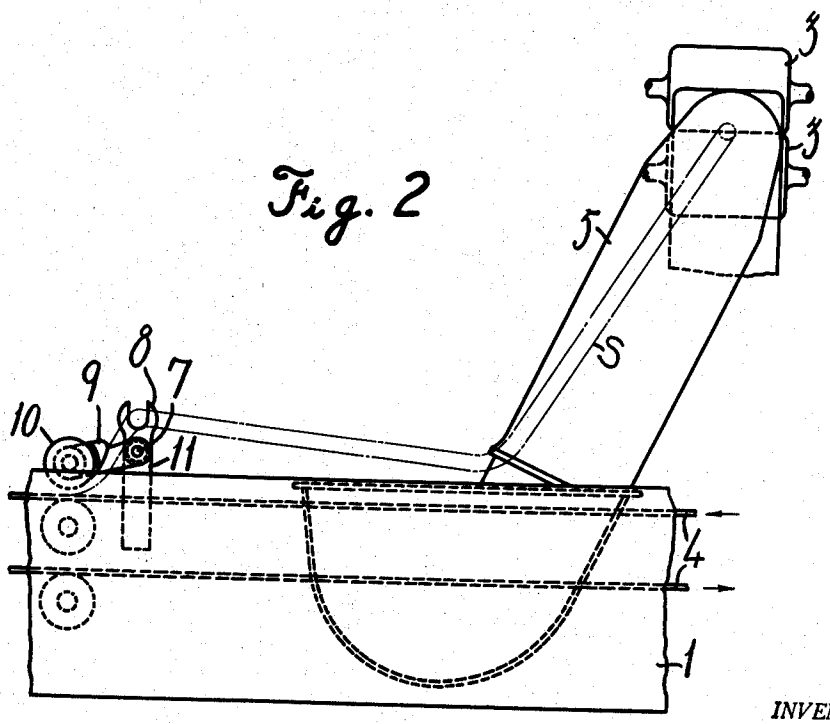


Fig. 2



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Fig. 3

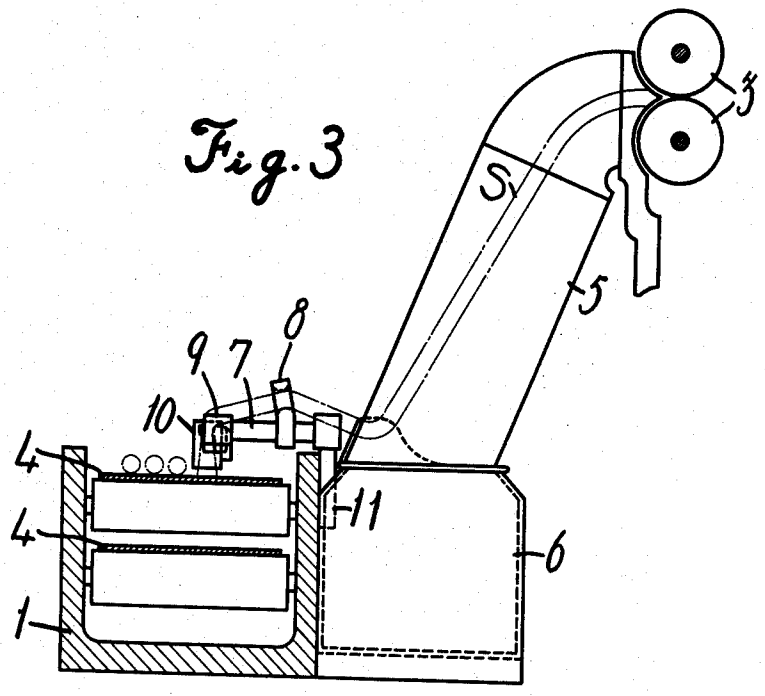
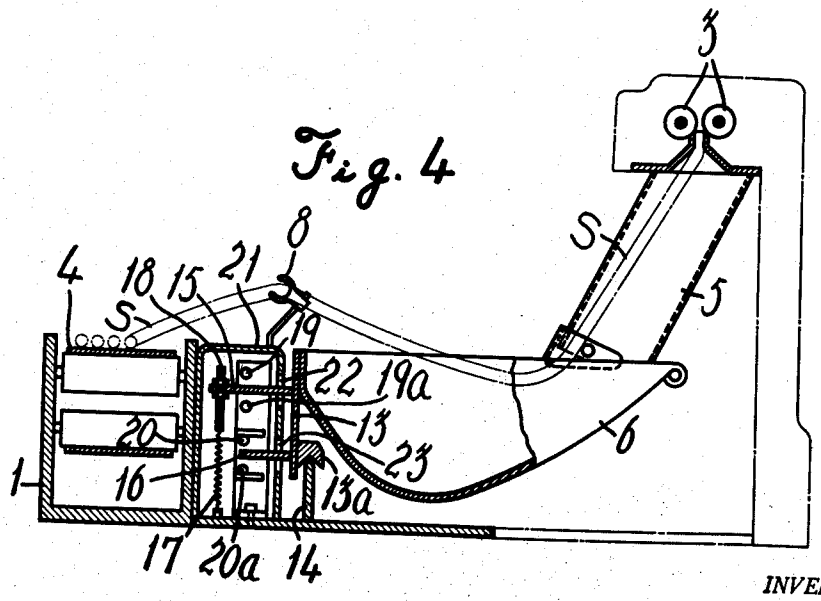


Fig. 4



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SLIVER LET OFF DEVICE OF A CARDING MACHINE

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3 Claims. (Cl. 19—157)

This invention relates to a sliver let off device of a carding machine comprising a reservoir, a cylinder downwardly extending from calender rollers in a carding machine to the reservoir and a guide means to lead a sliver temporarily deposited in the reservoir to a conveyer belt, which transmit slivers produced by carding machines to a drawing frame where the slivers are combined and drawn.

The main object of this invention is to provide a means between a carding machine and a conveyer belt for temporarily depositing a sliver produced by a carding machine when the drawing frame is stopped in its operation due to break of a sliver, so that the carding machine can continue its operation regardless of the stop of the drawing frame, whereby the production of the carding machine is not decreased.

Another object of this invention is to provide a means to automatically stop the operation of a carding machine when the sliver produced by the machine is deposited in a reservoir over a pre-determined weight and automatically re-start its operation when the deposited quantity of sliver is decreased less than a certain weight.

It is a well known art in wool spinning that several carding machines are installed along a belt conveyer, and the laps produced by the carding machines are arranged side by side on the belt conveyer and transmitted to a drawing frame. There is a certain difficulty in case this system is applied to a cotton spinning, because cotton fibers are shorter than those of wool so that cotton slivers are apt to break, especially in a drawing frame. When a sliver is broken in a drawing frame, operation of all carding machines connected to the belt conveyer must be stopped until the broken sliver is connected and the drawing frame is re-started. This of course decreases the production of the carding machines. According to this invention, a reservoir is provided for each carding machine, and a sliver produced by the carding machine is temporarily deposited in the reservoir, if the operation of the drawing machine stops, whereby the carding machine can continue their operation until the reservoir is full of sliver, when the operation of the carding machine is automatically or manually stopped. As the travelling speed of the conveyer belt is a little higher than the surface speed of calender rollers in a carding machine so as to draw out a sliver in a stretched condition, the sliver deposited in the reservoir is gradually drawn out until the reservoir becomes empty, when the operation resumes its normal condition.

Referring to the accompanying drawings,

FIG. 1 is a diagrammatical view showing the relation between carding machines, a belt conveyer and a drawing frame.

FIG. 2 is a side view of a part of a conveyer showing a cylinder, a reservoir and calender rollers for each delivery of a carding machine.

FIG. 3 is a side view looking from right hand side of FIG. 2, and FIG. 4 a similar view to FIG. 2 of a modification.

In the drawings, the bed for a belt conveyer is denoted at **1**, and several carding machines **2** are installed along a conveyer **4**, on one or both sides. Calender rollers **3** in each carding machine are provided in front of the upper end of a stationary cylinder **5**, which is obliquely positioned above a reservoir **6**. The reservoir is built on one side of the belt conveyer, and a pin **7** extends from a bracket **11** on the bed at a distance from the lower end of the cylinder **5**.

Guide pieces **8** and **9** are fixed on the pin, and their positions can be adjusted along the pin to guide the sliver to a required position on the belt. A roller **10** is rotatably held on the guide piece **9**, and is freely rotated by the friction with the surface of the conveyer belt.

A sliver *s* which has been delivered from the calender rollers **3** in the carding machine **1** descends in the cylinder, and is led to the conveyer belt by the guide pieces **8** and **9** and guide roller **10**. The sliver produced by each carding machine is placed on the belt **4** side by side, and collected together at the end of the conveyer, and is supplied to a drawing frame for further treatments. **12** is a diagrammatic representation of a driving mechanism for the conveyer belt.

If a sliver *s* is broken in the drawing frame, the operation of the frame automatically stops by a device, not shown, and the conveyer belt, too, stops its travel. However the carding machines continue their operations so that a sliver is delivered from each of the calender rollers **3**. The delivered sliver descends in the cylinder in a slightly coiled form and is deposited in the reservoir. As soon as the drawing frame re-starts and the conveyer belt begins its motion, the leading end of the sliver is drawn out by the belt and the guide roller.

In FIG. 4, the reference numerals **1** to **6** and **8** denote similar parts to those of FIG. 3. In this embodiment, the reservoir **6** has a vertical plate **13** at the side near the conveyer, and is supported on a knife edge **14** standing on the floor at a V-block **13***a* welded on the plate **13**. Two arms **15** and **16** extend horizontally from the plate and a spring **17** is elastically extended between the upper arm and the floor in order to obtain a balance of the reservoir. The balance spring may be replaced by a balance weight the position of which can be adjusted along the upper arm. **18** is an adjusting screw and **19** and **19***a* are stoppers to restrain the inclination of the arm **15** of the reservoir. There are two micro-switches **20** and **20***a* on each side of the arm **16**, which respectively opens and closes the circuit of the driving motor for the carding machine. These parts are protected by a cover member **21**, and vertical slits **22** and **23** are provided in the cover member to allow the arms **15** and **16** to exend out through the cover member.

In the normal operation, the tension of the balance spring **17** is so adjusted with the adjusting screw **18** as to raise the reservoir against its weight, so that the upper micro-switch **20** is closed and the carding machine operates. The sliver delivered from the calender rollers descends by its own weight through the cylinder and is sent to the belt conveyer, and is transmitted to the drawing frame with slivers produced by other carding machines installed along the conveyer.

When a sliver is broken in the drawing frame, the travel of the conveyor belt stops, but the carding machines continue their operation. As the leading end of the sliver is not drawn by the conveyer belt the sliver which is still being delivered from the calender roller is deposited in the reservoir. When the broken sliver is connected and the conveyer re-starts its travel, the leading end of the deposited sliver is again drawn out by the conveyer belt. The traveling speed of the belt is made a little higher than the surface speed of the calender roller so as to give a little tension to the sliver as above mentioned so that the quantity of sliver in the reservoir gradually decreases until the sliver resumes its normal traveling condition.

In the embodiment shown in FIG. 4, when the quantity of sliver deposited in the reservoir becomes much more than a predetermined weight, the reservoir rotates on the knife edge against the tension of the balance spring or weight, so that the upper micro-switch **20** is operated and opens the circuit of the driving motor for the carding machines, so that all the carding machines installed along the conveyer stop their operations. When the conveyer re-starts its traveling, the weight of the sliver deposited in the reservoir gradually decreases until the tension of the balance spring or weight becomes greater than the unbalanced weight of the reservoir, when the reservoir is raised and the lower micro-switch **20***a* is closed whereby the driving motor for the carding machines re-starts their operations.

We claim:

1. A sliver let off device for positioning between a carding engine and a conveyor belt for conveying slivers to a drawing frame, said let off device comprising a cylinder adapted to extend downwardly from the carding engine, a sliver reservoir having one end positioned under said cylinder and open so as to be able to receive a sliver from said cylinder, and guide means at the other end of the reservoir and adapted to guide the sliver from the lower end of the cylinder and the reservoir to the conveyor belt, an upright member having a knife edge thereon, said reservoir pivotally resting on said knife edge, two arms extending horizontally from said reservoir, balancing means on one arm balancing said reservoir on said knife edge, and switch means adjacent the other arm and adapted to be placed in the control circuit for the carding engine, whereby when said reservoir has a predetermined weight therein it becomes unbalanced and said switch means is actuated by said other arm to shut said carding engine off, and when less than said predetermined weight is in said reservoir, said reservoir is balanced and said switch means is actuated to cause said carding engine to run.

2. A sliver let off device for positioning between a carding engine and a conveyor belt for conveying slivers to a drawing frame, said let off device consisting essentially of a hollow cylinder having an open lower end and adapted to extend downwardly from the carding engine

at an angle to the vertical, an upwardly open sliver reservoir having a bottom which is slanted downwardly, curved at the lowermost part thereof, and then extends upwardly, said reservoir being positioned with the downwardly slanted part of the bottom beneath the open lower end of said cylinder, and guide means at the other end of said reservoir and adapted to guide the sliver from the lower end of the cylinder and the reservoir to the conveyor belt.

3. A sliver let off device for positioning between a carding engine and a conveyor belt for conveying slivers to a drawing frame, said let off device comprising a cylinder adapted to extend downwardly from the carding engine, a sliver reservoir having one end positioned under said cylinder and open so as to be able to receive a sliver from said cylinder, balancing means attached to said reservoir and balancing said reservoir about a pivot point, said reservoir being adapted to pivot in one direction about said pivot point when more than a predetermined amount of sliver is collected in said reservoir and to pivot in the other direction about said pivot point when less than the predetermined amount of sliver is collected in said reservoir, and circuit control means operable by movement of said balance means and adapted to be placed in the control circuit for the carding engine and actuating said control circut to shut the carding engine off when said reservoir pivots in said one direction when it has more than the predetermined amount of sliver therein and to actuate the control circuit to start the carding engine when the reservoir pivots in said other direction when it has less than the predetermined amount of sliver therein.

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