

Sept. 11, 1934.

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1,973,552

SPINNING FRAME

Filed Jan. 20, 1932

2 Sheets-Sheet 1

Fig. 1,

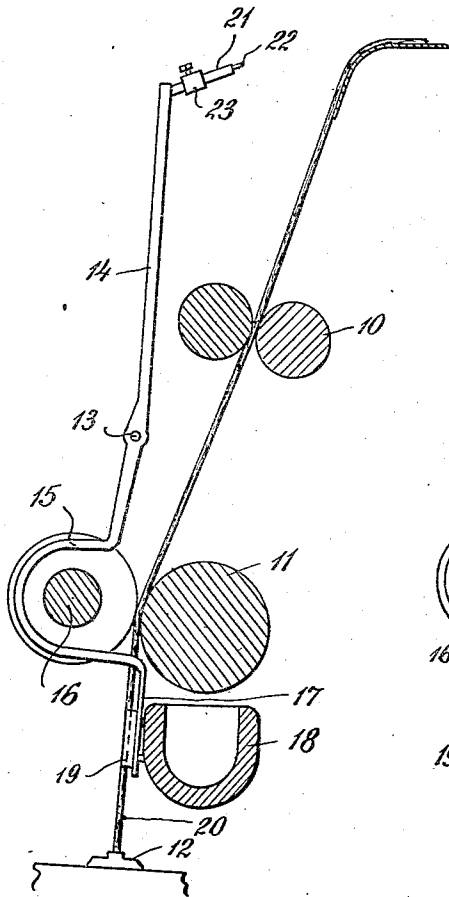
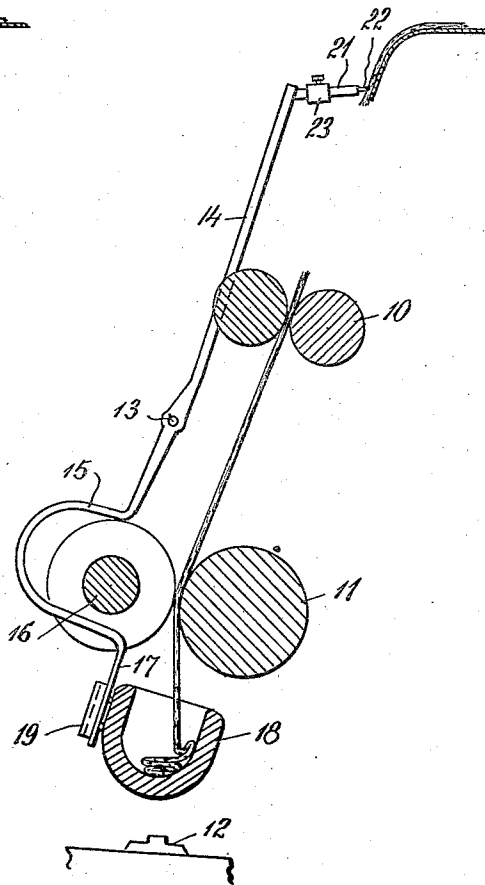


Fig. 2,



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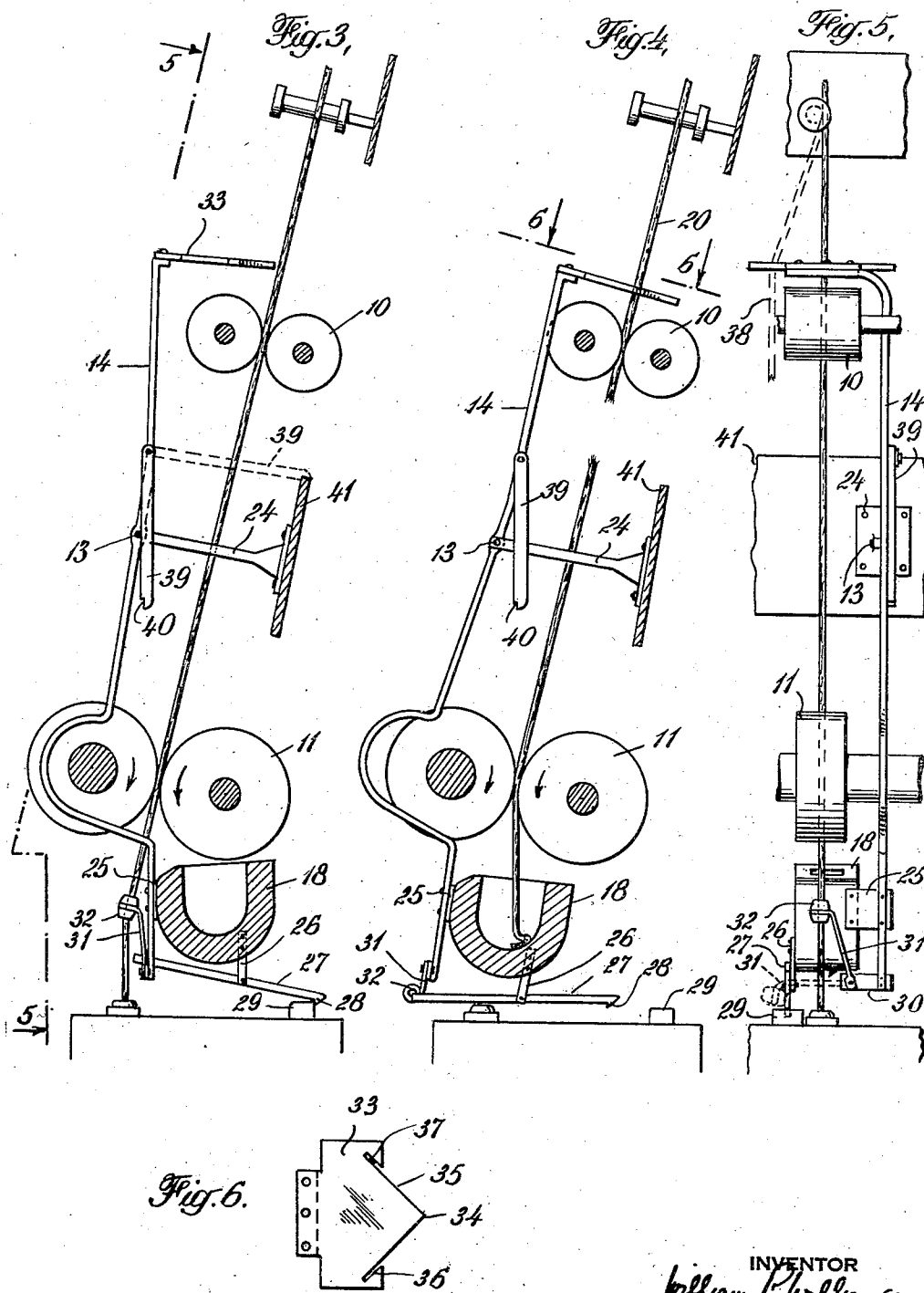
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2 Sheets-Sheet 2



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SPINNING FRAME

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18 Claims. (Cl. 19—166)

This invention relates to frames in which a sliver or rove is drawn, twisted, and wound on a bobbin or the like on a spindle. More particularly, the invention is concerned with a novel attachment for use in such frames which functions automatically upon the breaking of an end to prevent feeding of that end to the rolls of the frame, the device, if desired, being further constructed to catch and retain the end as it issues from the rolls. The device thus prevents entanglement of broken ends with those adjacent to it and thereby obviates the occurrence of secondary breaks which lower the efficiency of the frame to a high degree. The new device may be employed advantageously in jute frames and an adaptation of the invention for use in such frames will be described in detail to make clear its construction and operation, but it is to be understood that the principles of the invention may be equally well embodied in forms suitable for use in other frames and that the utility of the invention is not restricted to a specific frame construction.

Frames for spinning jute as now commonly used include spindles arranged in the continuous line through the entire length of the machine, and the sliver or rove passes between a pair of retaining rolls, over a breastplate, and then through a pair of drawing rolls from which it is led to a wharve on the spindle. As the spindles are disposed close together, the breakage of an end between the drawing rolls and the wharve usually results in the loose end or fly contacting with adjacent unbroken ends and when this occurs, secondary breaks are caused and this decreases the efficiency of the spinning operation and makes extra work for the operative.

The present invention is accordingly directed to the provision of a device for attachment to such frames which prevents feeding of the sliver or rove through the rolls after the end is broken either by engaging and holding it so that is pulled apart by the action of the rolls, or by guiding it away from the nip of the rolls, and the device may also be constructed to catch and retain the broken end issuing from the rolls. In addition, the device signals the occurrence of a break in the end to the operative, and, if desired, may be employed to smooth or slick the end, laying projecting fibres in such a way that they are twisted into the yarn, thus giving the product a smoother appearance and slightly increased strength.

One form of embodiment of the invention comprises a receptacle normally lying at one

side of the delivery point of the drawing rolls and urged by gravity, for example, to a position in line with the delivery point so as to receive the broken end feeding therethrough. The receptacle is kept from operative position by means contacting with the end leaving the drawing rolls, as for example, the receptacle may carry a block bearing against the end or the receptacle may be held out of operating position by means of a latch which may be released by a trigger held in one position by its contact with the end. In either case, so long as the end remains unbroken, the receptacle is held out of operation but when the end breaks and the receptacle is free to be moved by gravity, it advances into line with the drawing rolls and catches the broken end feeding therethrough.

Operatively connected to the receptacle is an element which functions upon breaking of an end to prevent the sliver or rove from continuing to be fed by the retaining rolls and when the end breaks and the receptacle advances as above described, this element engages the sliver or rove being fed and either holds it so that it is pulled apart by the retaining rolls or else causes it to be guided away from the nip of the rolls. In either event, the feeding of the strand is discontinued and with the broken end caught in the receptacle secondary breaks are prevented.

For a better understanding of the principles of the invention, reference may be had to the accompanying drawings, in which

Fig. 1 illustrates the device mounted in a spinning frame with parts shown in side elevation and other parts shown in section;

Fig. 2 is a view similar to Fig. 1 but showing the device in the position which it assumes after an end breaks;

Fig. 3 is a view similar to Fig. 1 showing a modified construction;

Fig. 4 is a view similar to Fig. 2 showing the construction illustrated in Fig. 3;

Fig. 5 is a front elevational view taken on the line 5—5 of Fig. 3; and

Fig. 6 is a plan view of a part of the device taken on the line 6—6 of Fig. 4.

In these drawings, only a few parts of the spinning frame are shown and those parts are conventionally illustrated.

In the construction shown in Fig. 1, the frame includes the usual retaining rolls 10, drawing rolls 11, and wharve 12. In a jute frame, there is ordinarily a breastplate, not illustrated, between the drawing and retaining rolls over

which the fibrous strand passes and against which it bears for support while it is undergoing draft.

Mounted on a pivot 13 suitably supported on the frame is an arm 14 which has an offset portion 15 so that it may pass by the shaft 16 of the outer drawing roll, the lower end 17 of the arm being reversely offset and carrying a receptacle 18 which lies beneath the drawing rolls and normally at one side of the delivery point. Attached to the end 17 of the arm is a block 19 in position to bear against the end 20 between the drawing rolls and the wharve. The face of the block which contacts with the end may be of a material such as rubber, cork, wood, etc., which performs smoothing or slicking action on the end, laying the projecting fibres and smoothing them down so that they can be twisted into the yarn.

The arm 14 extends upwardly beyond the pivotal point and at its upper end is provided with a rod 21 having a serrated end 22, the rod being mounted adjustably in a clamp 23 on the rod.

The arm 14 is so balanced that it tends to swing in a clockwise direction under the action of gravity but it is prevented from doing so by engagement of the block 19 against the end leaving the drawing rolls. This end is normally under a sufficient tension to keep the arm in the generally upright position illustrated in Fig. 1, and when the arm is thus held, the receptacle 18 is out of the way of the end and at one side of the delivery point of the drawing rolls and the serrated end of the rod is free of engagement with the sliver or rove advancing to the retaining rolls. When a break in the end occurs between the drawing rolls and the wharve, as is most frequently the case, the arm is released and swings over to the position illustrated in Fig. 2. The receptacle 18 now lies beneath the delivery point of the drawing rolls and in position to catch and retain the broken end feeding through. This prevents the end from contacting with adjacent ends and producing secondary breaks. At the same time, the serrated end 22 of the rod moves over into contact with the sliver or rove advancing toward the retaining rolls, and the sliver or rove is pulled apart by the action of the retaining rolls so that no further quantity is fed to the rolls.

In the construction shown in the other figures of the drawings, the arm 14 is pivotally mounted at 13 on a supporting arm 24 attached to the frame of the machine. The arm 14 carries a plate 25 at its lower end to which the receptacle 18 is attached. The receptacle is provided with a downwardly extending arm 26 on which is pivotally mounted a latch 27 having a hook 28 at its end which may be hooked over the rail 29. The arm 14 also carries a plate 30 at its lower end on which is pivotally mounted a trigger 31, this trigger carrying a yarn guide 32. Under normal conditions with the end running through the eye 32, the trigger stands substantially upright as indicated at Fig. 5 but when the end breaks, the trigger is released, falls to the dotted line position in Fig. 5, and strikes the forward end of the latch 27, causing it to be unhooked from the rail 29. The unbalanced arm 14 then swings clockwise on its pivot to cause the receptacle 18 to move to the position shown in Fig. 4 in line with the delivery point of the drawing rolls 11, the receptacle

then catching the broken end feeding through the drawing rolls.

At its upper end, the arm 14 carries a plate 33 of the construction illustrated in Fig. 6. This plate is formed along one side with a point 34 having side edges 35 which terminate in saw cuts 36. When the arm 14 is released by breakage of the end, the plate 33 advances against the strand. The latter then slides along one or the other of the sloping surfaces 35 until it enters the saw cut as indicated at 37, Fig. 6. During this sliding movement, the strand passes out from between the retaining rolls 10 as indicated at 38, Fig. 5, and the retaining rolls thus become inoperative to perform any further feeding action. At the same time, the strand is held against movement by its engagement with the walls of the saw cut.

In order that the operator may thread up the broken end without difficulty, an arm 39 is pivotally mounted on the arm 14 and normally hangs downwardly as shown in Fig. 4. When the end is to be pieced up, the operator swings the arm 39 upwardly so that its notched end 40 rests on top of the frame member 41, occupying the dotted line position shown in Fig. 3. The engagement of arm 39 with the frame member holds arm 14 and receptacle 18 in the ordinary operating position and the end can be pieced up and threaded through the guide and the trigger without releasing the latch and permitting arm 14 to swing. As soon as the piecing and threading operations are completed, the arm 39 is freed from the frame member, after which the device is in operative condition and will function as soon as the end breaks.

When all the ends are running in a spinning frame provided with a novel attachment, the arms 14 all extend upright with a uniform arrangement. When an end breaks, the arm associated with that end swings on its pivot to bring the receptacle into position to catch the broken end and since the new position of the arm is noticeably different from its original position, this serves as a signal to the operative that the end is broken. However, if the operative is busy at the time or does not notice the movement of the arm, the spinning operation continues with a loss of production with respect to the broken end only. That end is kept out of contact with adjacent ends by being caught in the receptacle and the members 21 or 33 at the upper end of arm 14 either cause the sliver or rove to be pulled apart or else guide it out from between the retaining rolls so that no further quantity is fed to the drawing rolls. In present frames, the breaking of an end requires immediate attention because as the sliver or rove continues to feed through, it causes multiple breaks with a substantial loss of production. Such frames, therefore, require constant and concentrated attention on the part of the operative since any failure to detect a breakage in an end may result in considerable loss in production and much labor for the operative. The new attachment, however, avoids such difficulties and insures that the breakage of an end will not result in multiple breaks. Also, it signals to the operative when a broken end occurs.

While I have described the invention in a form which includes a weighted arm carrying both the receptacle and the element used for causing the sliver or rove to be pulled apart, it is apparent that the device may be actuated by means other than gravity and that the re-

ceptacle and element may be separately mounted. Various other changes in the form in which the principles of the invention are utilized will readily occur to those familiar with the art.

5 What I claim:

1. In a frame the combination of rolls for retaining a strand, rolls for drawing said strand, a receptacle mounted movable beneath said drawing rolls, and means for holding said receptacle in inoperative position, said means being responsive to the breakage of the strand issuing from the drawing rolls to release said receptacle and permit it to advance to receive said broken strand.

15 2. In a frame, the combination of rolls for retaining a strand, rolls for drawing said strand, a receptacle movable into line with the delivery point of said drawing rolls, said receptacle being biased toward that position, and means for holding the receptacle out of said position and responsive to the breakage of said strand to release said receptacle.

20 3. In a frame, the combination of rolls for retaining a strand, rolls for drawing said strand, and a movably mounted receptacle tending to assume a position in line with the delivery point of the drawing rolls, the receptacle having a portion engaging the strand issuing from the drawing rolls and being held out of registry with said delivery point by said strand when the latter is unbroken.

25 4. In a frame, the combination of retaining rolls for a strand, rolls for drawing said strand, and a receptacle mounted movably beneath the drawing rolls and having a portion engaging said strand, said receptacle being held out of line with the delivery point of said drawing rolls by said strand while the latter is unbroken and moving into line with said delivery point by the action of gravity upon breakage of said strand.

30 5. In a frame, the combination of rolls for retaining a strand, rolls for drawing said strand, a receptacle movable into line with the delivery point of said drawing rolls, and biased toward that position, and an element engaging the strand issuing from the drawing rolls, this engagement overcoming said bias so long as the strand is unbroken.

35 6. In a frame, the combination of retaining rolls for a strand, drawing rolls for said strand, a receptacle urged to a position in line with the delivery point of said rolls, and means connected with the receptacle and contacting with the strand issuing from the drawing rolls, said means maintaining the receptacle out of line with the delivery point of the drawing rolls so long as the strand remains unbroken.

40 7. In a frame provided with rolls for retaining a fibrous strand and rolls for drawing said strand, the combination of a receptacle movable to a position in line with the delivery point of said drawing rolls and biased toward that position, an element movable to engage the strand feeding to the retaining rolls and operable to cause said strand to be pulled apart by said rolls after said strand is thus engaged, means contacting with the strand issuing from the drawing rolls and overcoming said bias so long as the strand remains unbroken, and a connection between said element and said receptacle operable to cause said element to engage said strand upon the breaking thereof and the movement of said receptacle.

75 8. In a frame, the combination of retaining

rolls for a strand, rolls for drawing said strand, an arm movably mounted and urged to a given position by gravity, a receptacle operatively connected to said arm and lying in line with the delivery point of said drawing rolls to catch the strand issuing therefrom when the arm assumes the said position, and a block operatively connected to said arm and contacting with the strand issuing from said drawing rolls, the tension on the strand while it is unbroken preventing movement of said arm.

80 9. In a frame, the combination of rolls for retaining a sliver or rove, rolls for drawing said sliver or rove, an arm movably mounted and urged to a given position by gravity, a receptacle operatively connected to said arm and lying in line with the delivery point of said drawing rolls to catch the strand issuing therefrom when the arm assumes the said position, an element operatively connected to said arm and movable thereby to engage the sliver or rove feeding to the retaining rolls and hold the sliver or rove so that it is pulled apart by the action of said rolls, and a block operatively connected to said arm and contacting with the strand issuing from said drawing rolls, said strand preventing movement of said arm, so long as the strand remains unbroken.

85 10. In a frame, the combination of retaining rolls for a strand, rolls for drawing said strand, a pivoted unbalanced arm, a receptacle carried by said arm and movable with the latter to a position in which it catches the strand issuing from said drawing rolls, and a block carried by the arm and engaging the strand issuing from the drawing rolls, the strand preventing movement of said arm to bring the receptacle into operative position, so long as the strand remains under tension.

90 11. In a frame, the combination of rolls for retaining a sliver or rove, rolls for drawing said sliver or rove, a pivoted unbalanced arm, a receptacle carried by said arm and movable with the latter to a position in which it catches the strand issuing from said drawing rolls, an element carried by the arm and having an end brought into contact by movement of the arm with the sliver or rove advancing to the retaining rolls, and a block carried by the arm and engaging the strand issuing from the drawing rolls, the strand while it remains under tension preventing movement of the block and thereby preventing the receptacle and element from becoming operative.

95 12. In a frame, the combination of rolls for retaining a strand, rolls for drawing said strand, a pivoted unbalanced arm, a receptacle carried by said arm and movable with the latter to a position in which it catches the strand issuing from said drawing rolls, a block carried by the arm and provided with a face engaging the strand issuing from the drawing rolls, the strand preventing movement of said block and arm to bring the receptacle into operative position, so long as the strand remains under tension, and said face on the block laying and smoothing down projecting fibres on said strand.

100 13. In a frame, the combination of rolls for retaining a strand, rolls for drawing said strand, a receptacle biased to a position in line with the delivery point of said drawing rolls, and means for holding said receptacle out of the said position, said means including an element contacting with the strand issuing from the drawing rolls and held in one position by said

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contact, said element being movable to another position upon breakage of said strand.

14. In a frame, the combination of rolls for retaining a strand, rolls for drawing said strand, a receptacle normally biased to a position in line with the delivery point of said drawing rolls, means including a part engaging the strand issuing from said drawing rolls for holding said receptacle against its bias, the breakage of said strand rendering said holding means ineffective, and means operable with said receptacle and movable to a position in which it engages the strand advancing to said retaining rolls and prevents further feeding of said strand thereto.
15. In a frame, the combination of retaining rolls for a strand, rolls for drawing said strand, a receptacle normally biased to a position in line with the delivery point of said drawing rolls, a latch for holding said receptacle against its bias, and a trigger for operating said latch, said trigger contacting with the strand issuing from said drawing rolls and held inoperative by said contact, the breakage of said strand permitting said trigger to release said latch.
16. In a frame, the combination of retaining rolls for a strand, rolls for drawing said strand, a receptacle normally biased to a position in line with the delivery point of said drawing rolls, means for holding said receptacle against its bias and operative upon breakage of said strand issuing from said drawing rolls to release the receptacle, and an element operatively connected with the receptacle and functioning upon breakage of said strand to engage the strand advancing to the retaining rolls and move said strand from between said rolls.

17. In a frame for drawing fibrous strands in the manufacture of yarn, the combination of rolls for retaining a strand, rolls for drawing the strand, a pivoted lever biased to one position, means for engaging the strand issuing from the drawing rolls, said means being operatively connected to the lever at one side of its pivot and overcoming the bias of the lever so long as the strand is unbroken, and an element mounted rigidly on the lever at the other side of its pivot, said element having a serrated edge movable at angle into engagement with the strand passing to the retaining rolls as the lever swings on its pivot in accordance with its bias, the teeth on said element holding the strand while it is pulled apart by said retaining rolls.

18. In a frame for drawing fibrous strands in the manufacture of yarn, the combination of rolls for retaining a strand, rolls for drawing the strand, a pivoted lever biased to one position, means for engaging the strand issuing from the drawing rolls, said means being operatively connected to the lever at one side of its pivot and overcoming the bias of the lever so long as the strand is unbroken, and an element mounted rigidly on the lever at the other side of its pivot, said element having an operating edge movable into engagement with the strand passing to the retaining rolls as the lever swings on its pivot in accordance with its bias, said edge of the element engaging and holding the strand while the latter is pulled apart by said retaining rolls.

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