

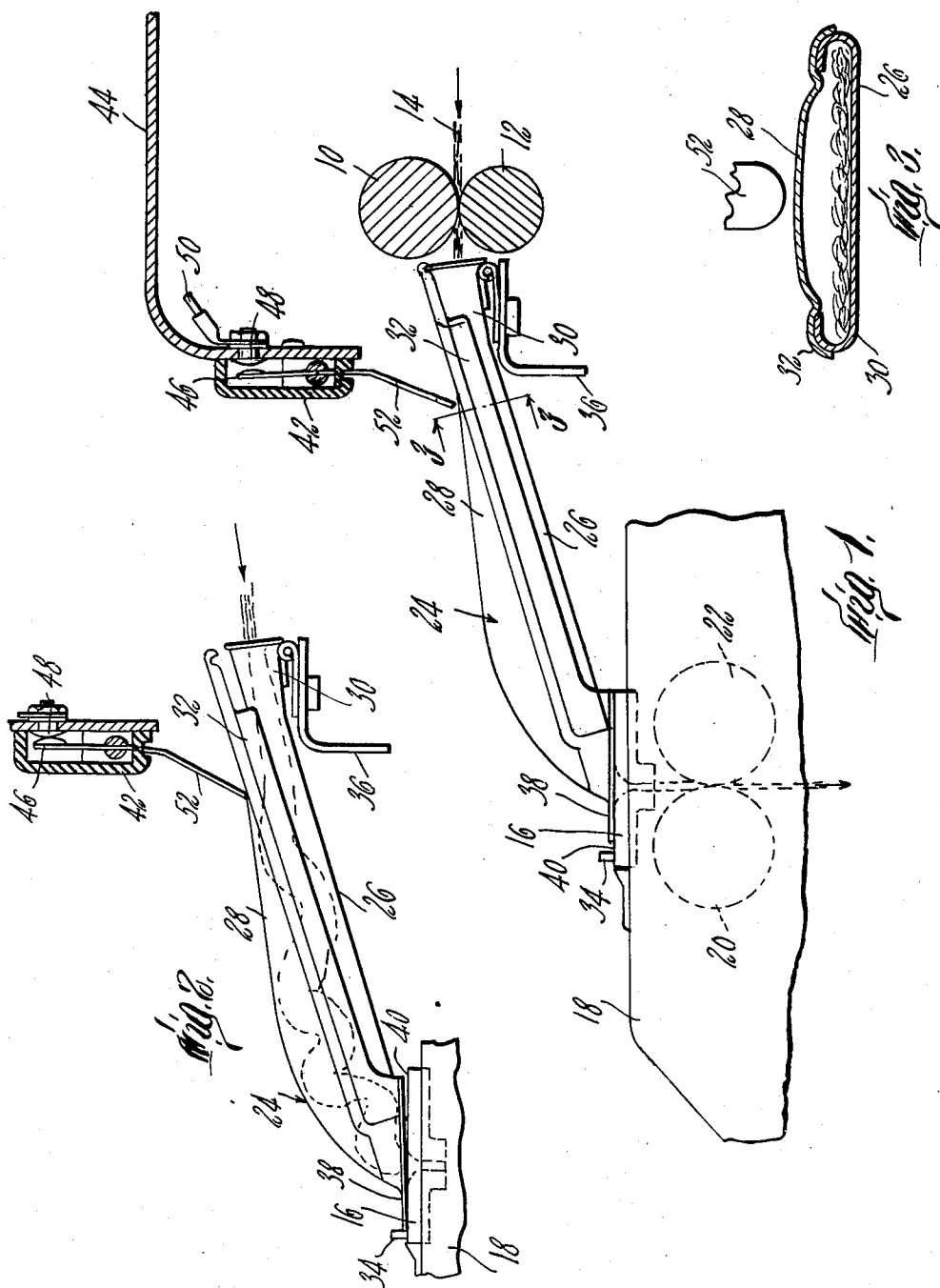
July 12, 1960

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2,944,302

DRAWING FRAME CONTROL MECHANISM

Filed Sept. 25, 1958



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2,944,302

DRAWING FRAME CONTROL MECHANISM

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Filed Sept. 25, 1958, Ser. No. 763,277

1 Claim. (Cl. 19-166)

This invention relates to textile drawing frames and more particularly to a novel control mechanism associated therewith.

In the conventional drawing frame sliver, under tension produced by the calender rolls, is transferred from the nip of the last pair of drafting rolls to the trumpet which is adapted to condense the sliver web into a strand and guide it into the bite of the calender rolls. The smooth flow of sliver through the trumpet may be interrupted by obstruction due, for example to bunches of waste carried by the sliver from previous operations or by excessive "fly" associated with the web. To signal such interruptions trumpet stop motions are frequently provided.

A frequently used type of stop motion includes a counterweighted trumpet. The frictional pull of the sliver passing through the trumpet tends to maintain the trumpet in a lower position. When an obstruction or "bung up" occurs the sliver strand between the trumpet and calender roll parts and the counterweighted trumpet rises. This movement, communicated through appropriate linkage, is utilized to stop the drawing frame. In this type of stop motion sufficient space must be provided between the trumpet and calender rolls so that the strand can part whenever a "bung up" occurs. The position of the trumpet relative to the calender rolls therefore is dependent on the length of staple in the sliver and a long staple fiber requires that the trumpet be backed off from the calender roll a considerable distance. Under those circumstances the condensing effect of the trumpet is significantly reduced, with a resulting impairment of the sliver quality.

Other prior art mechanisms include devices which are responsive to the tension on the sliver web. When the web tension changes due to an obstruction at the trumpet the mechanism operates to stop the frame. In general these latter devices may be characterized by their criticality of adjustment and their unreliability in operation.

Accordingly, a principal object of the present invention is to provide a novel and improved sliver control mechanism which is responsive to the improper transfer of the sliver between the drafting element and the trumpet.

Another object of the invention is to provide a drawing frame control mechanism suitable for use with any length of fiber and in which the trumpet may be fixed in position relative to the calender rolls such that the optimum relationship therebetween may be maintained.

Still another object of the invention is to provide a simple trumpet stop motion mechanism adapted to operate independently of the tension on the sliver.

Another and more specific object is to provide control mechanism comprising a sliver guide adapted to be located between the drafting element and the trumpet and a control device responsive to the flow of sliver relative to the guide.

In the preferred embodiment of the invention a sliver web enclosure is provided between the last rolls of the drafting element and the trumpet. This enclosure guides the sliver and translates it into proper form for passage

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through the trumpet. The enclosure is designed to provide proper aerodynamic characteristics to assist the proper movement of the sliver in a high speed drafting operation and consists of a base and preferably a cover. The end of the base adjacent the drafting element is pivotally mounted on the drawing frame structure and the opposite end thereof rests on the upper surface of the trumpet which is fixedly positioned relative to the calender rolls. A position responsive mechanism, mounted above the enclosure, is adapted to be actuated upon lifting of the sliver. Such lifting occurs when the smooth flow of sliver is disturbed, typically by a "bung up" at the trumpet. The signal resulting from the actuation of the position responsive device may be utilized to indicate the improper operation of the machine, to stop the operation of the drafting element, or for other purposes as desired. Although the preferred embodiment employs a cover to complete the enclosure it is also possible to operate the drawing frame using only the base of the enclosure as a guide means. Thus, the position responsive mechanism is actuated either directly by the rapid accumulation of sliver on the base or by the lifting of the enclosure cover caused thereby.

Other objects and advantages of the invention will be understood as the following description of the preferred embodiment of the invention progresses, in conjunction with the drawings, in which:

Fig. 1 is an elevational view of a portion of the drawing frame mechanism showing the control mechanism according to the preferred embodiment of the invention;

Fig. 2 is an elevational view of the control mechanism showing it in a second position; and

Fig. 3 is an enlarged sectional view of the apparatus taken along the line 3-3 of Fig. 1.

With reference to the drawings, the drafting element of the drawing frame includes, as its output a top roll 10 and bottom roll 12 through the nip of which passes the sliver web 14. The web of sliver then is guided to a trumpet 16 which is disposed above the calendering mechanism 18, in the path of the sliver. The trumpet acts to condense the web of sliver into a strand and guides that strand into the nip of two calendering rolls 20 and 22 which is disposed directly below the trumpet. The drawing frame associated with the preferred embodiment is a high speed frame capable of operating at speeds in excess of 300 feet per minute. An enclosure 24 for the sliver web is provided between the drafting element and the trumpet which acts to control the fly and produces a smooth transition from web to strand. The enclosure is substantially triangular in plan view and has a cross section which tapers from a substantial width adjacent the nip of the output rolls of the drafting element down to a narrow passageway above the trumpet 16. The enclosure comprises a base 26 and a top or cover portion 28. The base has upwardly extending and inwardly turned sides 30 which support the cover 28 and cooperate with its downwardly extending sides 32 such that a completely enclosed passageway is provided as shown in Fig. 3. The cover 28 is not fastened to the base 26 but merely rests on it. The interior surfaces of the enclosure preferably are smooth, all rough edges being avoided such that the sliver may be easily and efficiently guided through the transition between the output rolls and the trumpet. It is also preferable that the cover be made from plastic or similar material which is treated to avoid the generation of static electricity. The enclosure is described in detail in my copending application Serial No. 695,118 entitled Sliver Web Support and Cover, filed November 7, 1957, now Patent No. 2,858,577.

A pin 34 projects upwardly from the trumpet 16 and is adapted to prevent the cover from sliding forward onto the floor when it is lifted by an accumulation of

sliver. The upper end of the base 26 is pivotally mounted on the drawing frame structure 36 and the lower end thereof rests on the trumpet. The lower end of the cover 28 has a flanged portion 38 which also rests on the flat upper surface 40 of the trumpet. The cover, when lifted by a sliver accumulation, tends to pivot upwardly about pin 34 as shown in Fig. 2.

A switch 42 is mounted above the enclosure on the top clearer cover 44 which is associated with the drafting element. This switch includes normally open contacts 46 and 48 which are adapted to close an electrical circuit comprising line 50. The switch actuating element, which is responsive to the position of the enclosure, is in the form of a lever 52. The base of the lever is in close proximity to the top of the enclosure structure 24 as shown in Fig. 3 and is positioned such that the switch will be actuated upon an upward movement of the web enclosure cover. That actuation of the switch may be utilized to generate a signal which is transmitted via line 50 to control the operation of the drawing frame.

In normal operation the sliver web is fed continuously through the rolls 10, 12 and the enclosure to the trumpet. Should for any reason an excess of fiber accumulate in the enclosure the cover will lift up, pivoting about pin 34 as shown in Fig. 2. This movement will actuate the switch, closing the contacts 46 and 48, and a control signal will be generated which may be utilized to stop the frame or otherwise signal the improper operation.

In some installations it is found unnecessary to use the cover. In these cases when the trumpet becomes plugged sliver accumulates rapidly on the base member 26. This buildup of sliver can of itself serve to actuate switch 42. When the apparatus is operated without a cover the feeler or actuating lever is positioned in spaced relationship to the sliver web in normal operation. Thus the sensing structure has no tendency to distort or otherwise impair fragile sliver webs.

It will be seen that the invention provides a novel textile drawing frame control mechanism which is responsive to the movement of sliver between the drafting element and the trumpet. This mechanism provides a simple means of supervising the draw frame operation which is adapted to operate promptly upon the occurrence of a "bung up" and is preferably utilized to immediately stop the operation of the drafting element, thus conserving sliver and facilitating re-establishment of proper operation. Although, a preferred embodiment of the

invention has been shown and described it will be understood that the invention is not intended to be limited thereto or to details thereof and departures may be made therefrom within the spirit and scope of the invention as defined in the following claim.

I claim:

In a textile drawing frame a drafting element comprising a plurality of rolls adapted to form a sliver web, a pair of calender rolls, and fixedly positioned relative thereto, said trumpet being adapted to guide said sliver web into the bite of said calender rolls, a pin member extending upwardly from said trumpet, a sliver web confining enclosure disposed between the last pair of rolls of said drafting element adjacent the nip thereof and said trumpet, said enclosure having a base member with upstanding side portions and a cover member with depending flange portions adapted to engage said side portions to define a space for guiding the reduction of said sliver from a substantially flat web adjacent the output of said drafting element to substantially a strand suitable to pass through said trumpet, one end of said base member being pivotably mounted adjacent said drafting element and the other end being adapted to rest on said trumpet, said cover member having a flanged portion adapted to rest on the upper surface of said trumpet adjacent said pin member such that said pin member tends to maintain said cover in position, said cover member having a tendency to be lifted by an accumulation of sliver within said enclosure upon the occurrence of an obstruction to the movement of sliver through said trumpet, and control means including a switch mounted above said enclosure and having an actuating lever depending below said switch and adjacent said enclosure cover, said switch adapted to be actuated upon a lifting of the cover member such that it contacts said lever.

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