March 31, 1964 J. NOGUERA 3,126,586

TEXTILE FIBRE ROLLER DRAFTING APPARATUS

Filed Sept. 28, 1961 2 Sheets-Sheet 1

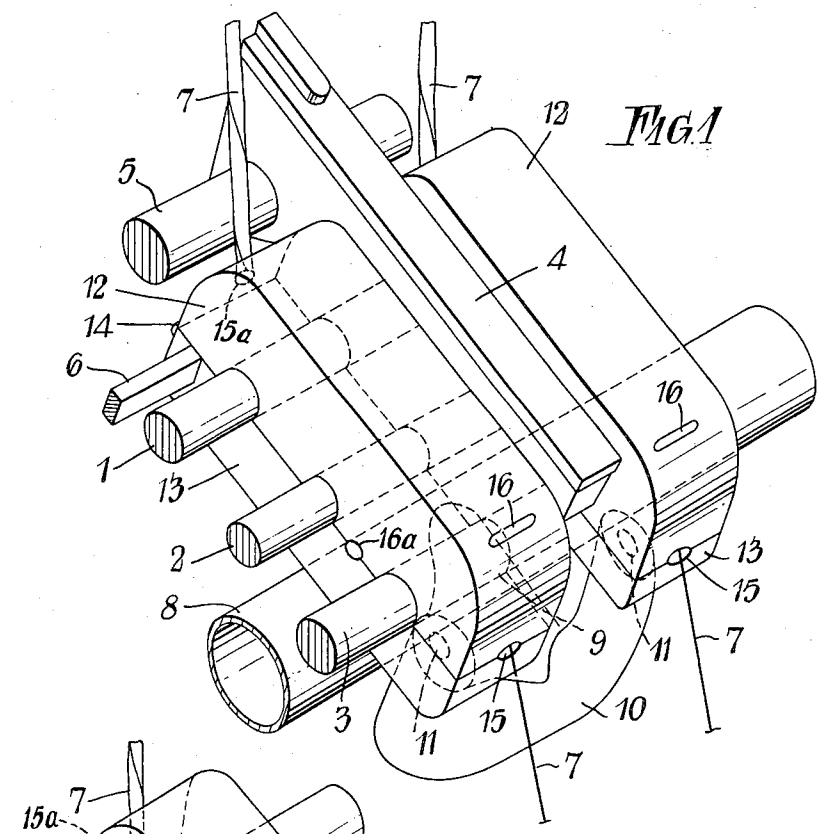


FIG. 1

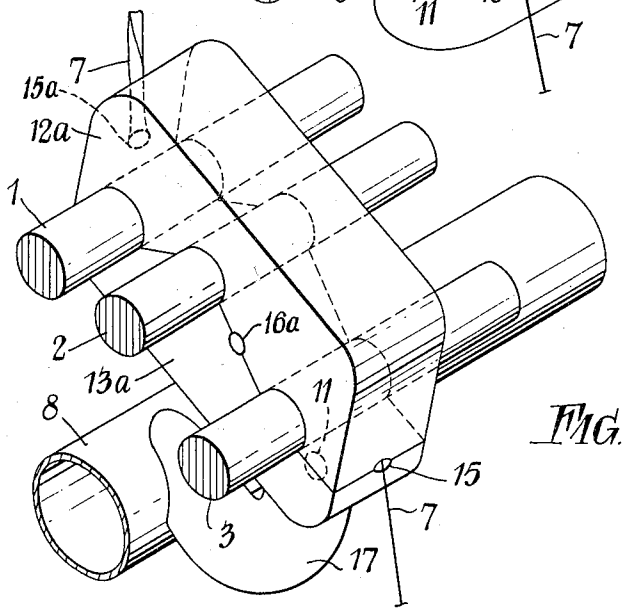


FIG. 2

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FIG. 3.

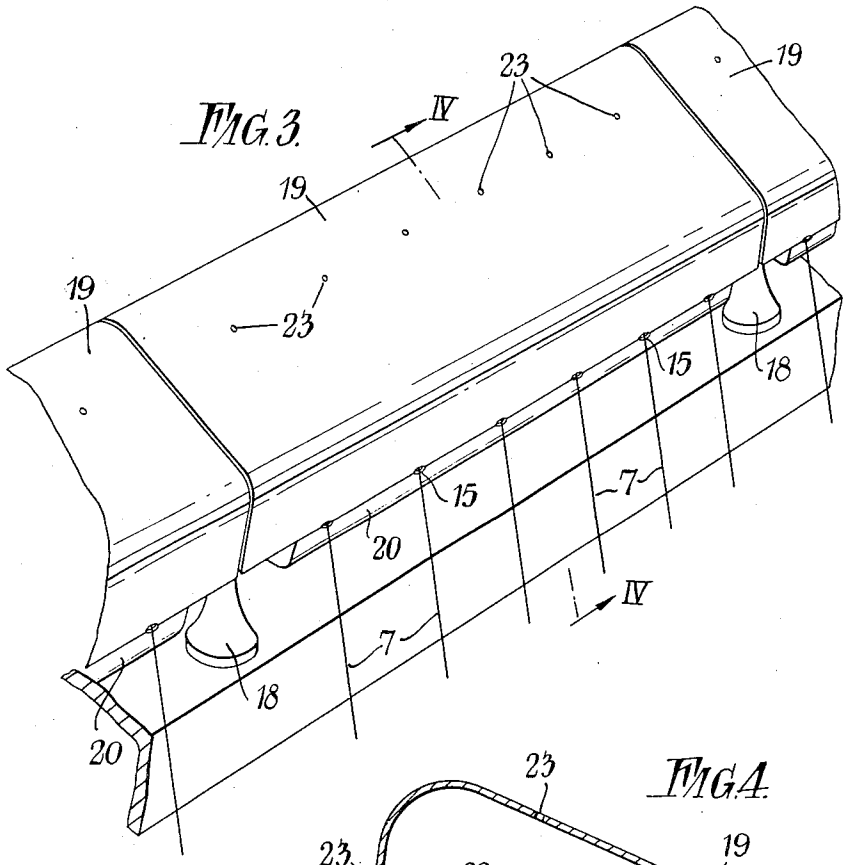
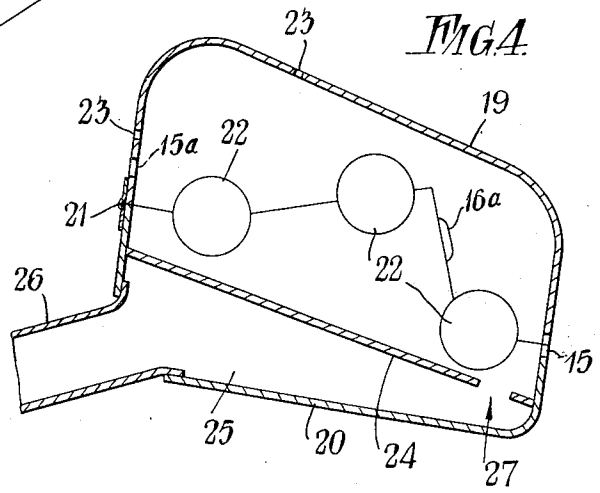


FIG. 4.



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TEXTILE FIBRE ROLLER DRAFTING APPARATUS

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11 Claims. (Cl. 19—263)

This invention relates to textile fibre roller drafting apparatus of the kind incorporating a plurality of roller drafting mechanisms mounted side-by-side along the length of a machine, and is concerned with pneumatic devices for collecting broken ends and generally cleaning the roller drafting mechanisms in such machines.

Pneumatic broken end collectors have been a great practical success and are today being adopted almost everywhere in preference to the orthodox, flannel-covered, revolving under-clearers. With the orthodox under-clearer, when an end breaks, the fibres are picked up as they emerge from the front rollers and are wrapped around the clearer forming a lap which increases in thickness until an operator comes round to attend to the matter. If the end remains broken for too long a period, the lap formed around the clearer may be so large as to impair the clearer's satisfactory rotation. When this happens, the drafted material which falls out from the front rollers may become attached to some of the adjacent ends and frequently results in some of these adjacent ends being also broken.

The advantage of the pneumatic collector is that fibres are sucked into the collector's orifice and the operator always finds conditions ready for merely piecing-up the ends, with no lap to be removed, no matter how long the end has been broken.

Two main drawbacks impede the present pneumatic collectors from being a still greater success. One such drawback is the great amount of power required to obtain sufficient suction to ensure that a broken end will be almost immediately drawn into the collector's orifice. The other is that, with the removal of the ordinary under-clearers and with the collector orifices necessarily being small and restricted to positions directly under the points where the ends are delivered by the front rollers, the front bottom rollers of a machine using pneumatic end collectors soon become covered with loose fibres. This is a serious fault because the layer of loose fibres is eventually picked up by the material running through the front rollers, thus causing slubs in the roving or yarn which is being produced. So serious is this drawback that, in particular cases, a revolving flannel-covered clearer is being mounted in addition to the duct of the pneumatic collector, even though this arrangement substantially complicates the machine.

In addition to allowing the front bottom rollers to become covered with fibre and dust, the pneumatic collectors in present general use have the further drawback of tending to make the whole of the drafting equipment dirtier, because the row of orifices in a collector suction duct creates an airflow towards the drafting system in general, and thus induces more dust and fly to fall on the drafting parts than is normal on machines using the orthodox under-clearers.

A main object of the present invention is to obviate the aforementioned drawbacks arising from the use of pneumatic collectors.

Accordingly the invention provides a roller drafting apparatus of the kind specified, having a pneumatic cleaning and broken end collecting device including a suction orifice positioned to draw-in broken ends emerging from the front rollers of a drafting mechanism and a casing

into which said orifice opens and which totally encloses the drafting mechanism, so as to increase the suction effect of said orifice whilst protecting said mechanism from accumulations of dust and fly, said casing being provided with air inlet means arranged to direct one or more blasts of air, indrawn by the suction, on to predetermined parts of the encased drafting mechanism for cleaning purposes.

The casing is preferably provided with a number of dismantlable or hinged wall parts to ensure ready access to the encased rollers for piecing-up and other purposes, and may have a number of air inlets located therearound in such positions that air blasts drawn therethrough into the casing as a result of the suction will be directed towards those parts of the equipment which are most liable to collect dust and loose fibres.

In order that the invention may be clearly understood and readily carried into effect, a number of embodiments will now be described in detail with reference to the accompanying drawings in which:

FIGURE 1 is a part-sectional perspective view showing a pair of pneumatic devices of the invention applied to adjoining roller drafting mechanisms of a drafting apparatus having three consecutive roller lines,

FIGURE 2 is a part-sectional perspective view similar to FIGURE 1 showing a pneumatic device of the invention modified to accommodate an alternative form of three-line roller drafting mechanism,

FIGURE 3 is a part-sectional perspective view, to a smaller scale than FIGURES 1 and 2, showing a further modified pneumatic device of the invention arranged to enclose all the roller drafting mechanisms between two adjoining roller stands in a drafting apparatus, and

FIGURE 4 is a section to a larger scale on the line IV—IV of FIGURE 3, the drawing rollers being omitted for greater clarity.

Referring now to the drawings, in which like parts have the same references throughout, FIGURE 1 shows the invention applied to two adjoining roller drafting mechanisms having common lower driving rollers **1**, **2** and **3** and the usual dual-boss top driven rollers (not shown) which are conventionally supported and weighted from their centre necks by an overlying top arm **4**. This top arm is supported in well-known manner by a bar **5** mounted at the rear of the machine, and a traverse bar **6** may also be arranged to extend along the machine behind the rearmost roller pairs. This bar **6** then carries the usual trumpets or guides (not shown) through which fibre strands **7** are guided into the intake nip between the rearmost drafting rollers to emerge, in drafted form, from the delivery nip of the leading drafting rollers.

To provide each of the described roller drafting mechanisms with a pneumatic cleaning and broken end collecting device of the invention, a suction duct **8** is arranged to extend along the apparatus beneath the drafting rollers, or elsewhere if desired. This suction duct **8** then has a branch pipe **9** opening therefrom between each pair of adjoining drafting mechanisms to communicate, at the outer end, with the transverse portion of a U-shaped stand pipe **10**. The upper arm ends of this stand pipe are each provided with a suction orifice **11**, these suction orifices **11** being each located immediately below the respective delivery nips between the leading roller pairs of the drafting mechanisms so as to draw-in broken ends when these occur.

Each casing may be of sufficient height and width to accommodate a weighting top arm for the top driven rollers similar to the top arm **4** of FIGURE 1 and its supporting bar **5**, the side walls of the casing being provided with appropriate openings through which the bar **5** can extend.

To increase the suction through an orifice for a given power input, each such orifice is arranged to open through the bottom of a casing composed of upper and lower parts **12** and **13** which may be connected together at the rear end by a hinge **14**. These casing parts **12** and **13** are arranged wholly to enclose all the consecutive drafting rollers of a drafting mechanism, as well as the rear traverse bar **6** when provided, there being complementary recesses formed in the side walls of the casing parts through which the driving rollers **1**, **2** and **3** and the traverse bar **6** can project on each side of the casing. To locate the casing parts in position around the rollers and traverse bar, the rear hinge **14** could be spring loaded or appropriate latch means may be provided. With the illustrated arrangement, the top part **12** of a casing can readily be raised about its rear hinge **14** to expose the entire drafting field for purposes of piecing-up an end that has been broken or for any other reason. At the rear hinged end of the casing, there is provided an inlet **15***a* through which a fibre strand **7** can pass into the encased drafting mechanism and, at the forward casing end, there is provided an outlet **15**, between the adjoining front edges of the top and bottom casing parts, through which the drafted strand passes to a spindle (not shown).

By completely boxing in the drafting mechanisms as illustrated, excess deposits of fly and dust which would tend to accumulate on the mechanism parts, due to a general air flow towards and over the mechanism induced by the suction effect, are avoided. To dislodge any fly and dust which may tend to settle, however, it is desirable to create a controlled blowing effect over parts of the mechanism, blowing being usually more effective than suction in dislodging such dust and fly. For this purpose, each casing may be provided with an air inlet **16** or may have a number of additional or alternative air inlets positioned as desired over the casing area. Alternatively, these inlets may be provided by gaps **16***a* left between the upper and lower casing parts. In any event, the purpose of the air inlets is to create blasts of air within the casing which have sufficient velocity and the necessary direction to clean or help clean those parts of the drafting equipment which are most liable to receive dust and fly deposits. Such air blasts are, of course, created as a result of the suction through the casing orifice.

In the modified embodiment illustrated in FIGURE 2, a pneumatic device of the invention is shown applied to an alternative form of roller drafting mechanism which again forms part of a drafting apparatus having three consecutive roller lines. In this apparatus, however, the driving rollers **1** and **3** are arranged below the drafting field whilst the driving roller **2** is disposed above the drafting field. The driving rollers **1**, **2** and **3** have driven rollers (not shown) co-operating therewith to form individual drafting mechanisms each serving a single spindle, the manner of mounting these driven rollers having no bearing on the present invention. As in the previous embodiment, the rollers of the drafting mechanism are enclosed by a casing having upper and lower parts **12***a*, **13***a* which are connected at the rear end by a hinge (not shown) and which have the side walls provided with complementary recesses to enable the driving rollers to extend therethrough. An inlet **15***a* for the fibre strand is again provided at the back of the casing and an outlet **15** at the front. A suction orifice **11** opens through the floor of the lower casing part so as to be located immediately below the delivery nip between the leading pair of rollers of the drafting mechanism. The suction orifice **11** is, in this embodiment, provided on the upper end of a single branch pipe **17** opening from the suction pipe **8**. The functioning of the pneumatic device shown in FIGURE 2 is substantially the same as the pneumatic devices shown in FIGURE 1, air inlets such as **16***a* being again provided between the casing edges or through the casing walls to induce the required air blasts within the casing.

The third embodiment of the invention illustrated in FIGURES 3 and 4, is suitable for use with three line roller drafting apparatus having the driving rollers arranged as shown in FIGURE 2. In this third embodiment, an elongated casing is arranged to enclose all the individual roller drafting mechanisms between adjoining roller stands **18** of the apparatus, the casing being itself supported on these stands in any convenient manner to align with the ends of adjoining similar casings which extend between stands throughout the length of the apparatus. Each such casing extending between roller stands has an upper part **19** and a separate lower part **20**, the parts being secured together at the back of the casing by a hinge **21**. The ends of the casing, in the form illustrated, are closed by side walls having registering recesses **22** therein through which the driving rollers can extend. Alternatively, by closely abutting adjoining casings, it may be possible to eliminate the side walls from all casings other than at each end of a line of casings.

Each elongated casing is provided with inlets **15***a* for fibre strands, which are positioned one behind each drafting mechanism to be enclosed by the casing, as well as outlets **15** for the drafted strand, these outlets being positioned one in front of each mechanism and being conveniently formed, as in the previous embodiments, between the adjoining edges of the upper and lower casing parts. Air inlets **23** may also be provided in the upper casing part either as illustrated or elsewhere according to the particular type of drafting mechanisms in use and the desired location and direction of the air blasts. Alternatively, such air inlets could be formed by gaps **16***a* between the casing parts as in the previous embodiments.

In the lower casing part **20**, a false bottom or baffle **24** is provided which extends over the full length and width of the casing to enclose a suction compartment **25** therebeneath. This suction compartment **25** is conveniently connected by a centre branch pipe **26** to a suction duct which may be similar to the duct **8** as shown in FIGURES 1 and 2, except that it may be conveniently located rearwardly of the drafting apparatus. A number of suction orifices **27** are then arranged to open from the suction compartment **25** through the false bottom **24** of the lower casing part, one such suction orifice **27** being located immediately below the delivery nip of each drafting mechanism enclosed by the casing. It would, of course, also be possible to provide additional suction orifices in the false bottom **24** of the lower casing part, should it prove desirable to create additional suction points to aid the disposal of dust and loose fibres.

The embodiment shown in FIGURES 3 and 4 functions in the same way as the embodiments shown in FIGURES 1 and 2, the suction orifices **27** serving to draw in any broken ends which may occur during a drafting operation. At the same time, air blasts are created at strategic positions in relation to the drafting mechanisms so as to blow over those parts of the mechanisms which are most likely to receive deposits of dust and loose fibres.

It will, of course, be appreciated that the various casing forms illustrated are only by way of example and, in fact, many different forms of casing can be employed in accordance with the invention providing such casings are adapted to provide accessibility to the equipment for piecing-up and other purposes and also serve to create the desired air blast and suction conditions.

I claim:

1. For use with a textile fibre roller drafting apparatus having a roller drafting mechanism, pneumatic means for cleaning said mechanism and collecting broken ends of fibre strands comprising a casing adapted to enclose the drafting mechanism and having a fibre strand inlet and a fibre strand outlet for the said mechanism, and suction means including a suction orifice opening into said casing, to draw-in broken ends of the fibre strands emerging from the drafting mechanism, said casing being operative to increase the suction effect while protecting the drafting

mechanism from accumulations of dust and fly and being provided with at least one air inlet connected to said suction means and adapted to direct blasts of air, indrawn by the suction means, on to the enclosed drafting mechanism for cleaning the mechanism.

2. Pneumatic means as claimed in claim 1 wherein the casing is composed of at least two separable parts whereby access can be readily had to the drafting mechanism.

3. For use with a textile fibre roller drafting apparatus having a drafting mechanism including driving rollers, pneumatic means for cleaning said mechanism and collecting broken ends of fibre strands comprising a casing adapted to enclose a drafting mechanism and having a fibre strand inlet and a fibre strand outlet for the said mechanism, and suction means including a suction orifice opening into said casing to draw-in broken ends of the fibre strands emerging from the drafting mechanism, said casing, which is operative to increase the suction effect while protecting the drafting mechanism from accumulations of dust and fly, being provided with at least one air inlet connected to said suction means and adapted to direct blasts of air, indrawn by the suction means, on to the enclosed drafting mechanism for cleaning the mechanism, and being composed of at least two hingedly connected parts with side wall openings adapted to enable the driving rollers to extend therethrough.

4. Pneumatic means as claimed in claim 3 wherein said air inlet is formed by gaps between said casing parts.

5. For use with a roller drafting apparatus incorporating a plurality of roller drafting mechanisms, pneumatic means for cleaning said drafting mechanisms and for collecting broken ends of fibre strands emerging therefrom, said pneumatic means comprising a plurality of separate casings adapted to enclose the respective drafting mechanisms and to protect the latter from accumulations of fly and dust, each casing having a fibre strand inlet and a fibre strand outlet for the enclosed drafting mechanism, and having a suction orifice opening into said casing, and a common suction duct in communication with each suction orifice so that the broken ends of the fibre strands emerging from a drafting mechanism are drawn into the suction orifice of the casing enclosing said mechanism, each casing further having at least one air inlet connected to said duct and adapted to direct blasts of air, indrawn by the suction in said suction duct, on to the enclosed drafting mechanism for cleaning the mechanism.

6. Pneumatic means as claimed in claim 5 further comprising a U-shaped stand pipe having upper arm ends, and a branch pipe connecting said stand pipe to said suction duct, the suction orifices of adjoining casings being provided in said upper arm ends of the stand pipe.

7. For use with a plurality of roller drafting apparatuses each including a drafting mechanism having drafting rollers and pairs of stands supporting said rollers, pneumatic means as claimed in claim 5 wherein each casing is adapted to extend between the stands of each pair, dividing means are provided for forming in each casing a suction compartment and said means have suction orifices adapted to open therethrough below the drafting rollers.

8. Pneumatic means as claimed in claim 7 wherein said dividing means comprises a false bottom in each casing to form said suction compartment and said pneumatic means further comprises at least one branch pipe connecting said suction compartment to said suction duct.

9. For use with a roller drafting apparatus having a drafting mechanism including front drafting rollers, pneumatic means for cleaning said drafting mechanism and for collecting broken ends of fibre strands, comprising a casing adapted to enclose the drafting mechanism and having a rear fibre strand inlet and a front fibre strand outlet, and suction means including a suction orifice opening into said casing to draw-in broken ends of the fibre strands emerging from the front rollers, said casing being operative to increase the effect of said suction while protecting the drafting mechanism from accumulations of dust and fly, and being provided with at least one air inlet connected to said suction means adapted to direct blasts of air, indrawn by the suction means, on to the enclosed drafting mechanism for cleaning the mechanism.

10. Pneumatic means as claimed in claim 9 wherein the suction orifice is adapted to be located below the front drafting rollers.

11. Roller drafting apparatus of the kind specified comprising a drafting mechanism including front rollers and pneumatic means for cleaning said drafting mechanism and for collecting the broken ends of the fibre strands emerging from the front rollers comprising a casing enclosing the drafting mechanism and having a fibre strand inlet at the back thereof and a fibre strand outlet at the front, and suction means including a suction orifice opening into said casing and positioned to draw-in said broken ends from the front rollers, said casing being adapted to increase the effect of the suction while protecting the drafting mechanism from accumulations of dust and fly and being provided with at least one air inlet connected to said suction means and adapted to direct blasts of air, indrawn by the suction means, on to the enclosed drafting mechanism.

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