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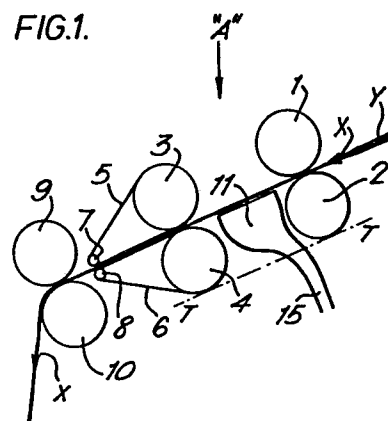
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54 **Dust removal in a textile drafting apparatus.**

57 In the drafting system of a ring frame a suction nozzle (11) is placed between the middle (3, 4) and back drafting (1, 2) rollers closely adjacent the roving to apply suction directly to the roving. The nozzle is of maximum length to be received in the space and of sufficient width to accommodate the slow traverse. An airflow generally of the order of 0.25 cfm is used and occasionally is increased to purge the system.



This invention relates to apparatus for drafting textile material and particularly such apparatus including means for removing dust and other extraneous waste from the material.

In drafting apparatus as used for example in a ring frame, suction devices have been used in various areas in an attempt to remove the dust and fly. Almost all modern ring frames have a suction nozzle for each drafting system at the point where the fibres issue from the front drafting rollers, both to collect dust and fly and also to collect the broken end at an end break. Furstenberg in his article in Melliand (October 1974) suggests that 80 - 85% of the dust is removed at this point.

It has also been proposed to use suction in other areas for example on the drafting rollers themselves. Additionally British Patent specification No. 952,367 discloses an arrangement wherein the whole area under the drafting system is cleaned by a duct beneath the drafting rollers. This arrangement suffers from the severe disadvantage that it uses an excessive amount of air and for this reason has not been accepted commercially.

Dust, as is well known, is intolerable in textile mills because it is so dangerous to health and the present inventor was faced with the problem of how to remove further dust from the apparatus to still further reduce the risk to health while keeping at a low level the amount of air required.

Accordingly the invention provides an apparatus for drafting textile materials comprising two pairs of rollers forming two consecutive nips through which the textile material passes and between which the material is drafted, and means for applying suction to the material as it passes between the two consecutive nips.

It is preferred that the suction means is arranged closely adjacent the material as it passes between the two consecutive nips. The suction means comprises a nozzle or elongate duct located on one side of the material closer to the material than the common tangent of the rollers.

The suction means is arranged to provide a suction air flow of the order of 0.25 cubic feet per minute, and preferably lying in the range 0.2 to 0.5 cfm.

The invention will now be described more fully with reference to the accompanying drawings in which:

Figure 1 is a schematic side elevation of a conventional apron drafting system showing the positioning of a suction nozzle;

Figure 2 is a view of the apparatus of Figure 1 in the direction of the arrow 'A'; and

Figure 3 shows the general configuration of the suction nozzle of Figure 1.

With reference to the above drawings Figure 1 shows a conventional apron drafting system in which three pairs of rollers are used. In the direction of processing (shown by the arrows 'X') the drafting system includes a first pair of rollers comprising a bottom roller 2 and a co-operating top roller 1. These pair of rollers being conventionally known as back rollers. The material or roving 'Y' to be spun into yarn enters the nip of the rollers 1 and 2 and passes on to the second pair of rollers 3 and 4. These rollers comprise a top roll 3 and a bottom roll 4 and are conventionally known as middle rollers. The mounting arrangements for the top rollers for convenience of illustration are omitted from the drawings. Around the rollers 3 and 4 are aprons 5 and 6 the aprons being supported at their converging ends by members 7 and 8. The material then passes between the aprons 5 and 6 to a third pair of rollers comprising a top roller 9 and a bottom roller 10, conventionally

known as the front rollers of the drafting system. During its progression through the above drafting system the material is drafted between the back and middle rollers and also between the middle and front rollers.

During the drafting of the material it has been found by the present inventor that dust and fly is liberated especially in the area between the middle and back rollers. This liberation is chiefly caused by the friction between adjacent fibres. The liberated dust and fly then becomes suspended in air currents around the drafting system and floats around and can be inhaled by an operative. It also settles on machine parts or is picked up by the material being processed and is subsequently spun with this material into yarn. In order to remove the dust and fly from this area between the middle and back bottom rollers a nozzle 11 is positioned closely adjacent the material being processed. A distance of 5 mm between material and nozzle top has been found to be suitable. It has also been found that, under certain conditions it is possible to locate the suction nozzle at a greater distance from the material being processed but the suction means should be positioned above the common tangent to the bottom rollers 4 and 5 (shown at T). The nozzle is of the general configuration shown in Figure 3 and is of sufficient width to continue to remove dust and fly at the extreme ends of the slow traverse used conventionally during normal processing. This movement is shown by arrows Z in Figure 2.

Referring to Figure 3 the nozzle 11 is generally elliptical having a major axis 13 of 2.5 cm and a minor axis 14 of 1.5 cm. The length of 2.5 cms has been chosen as being a reasonable maximum possible length bearing in mind the necessity for adjustment of the roller spacing for different staple lengths. Thus the nozzle is elongate and extends along the maximum permissible length of the material.

It has been found that efficient cleaning of the area between the

back and middle bottom rollers can be effected using very low air flows to exhaust the extraneous matter. Under one set of conditions it was found that a value of .06 cfm was sufficient to remove the dust and fly effectively. In processing very dirty materials a higher value is required but, in tests this did not exceed 0.25 cfm. In other circumstances up to 0.5 cfm could be required.

By placing a suction nozzle closely adjacent the material, suction is applied directly and only to the material, as opposed to the prior art arrangements wherein suction is applied generally to the whole drafting area.

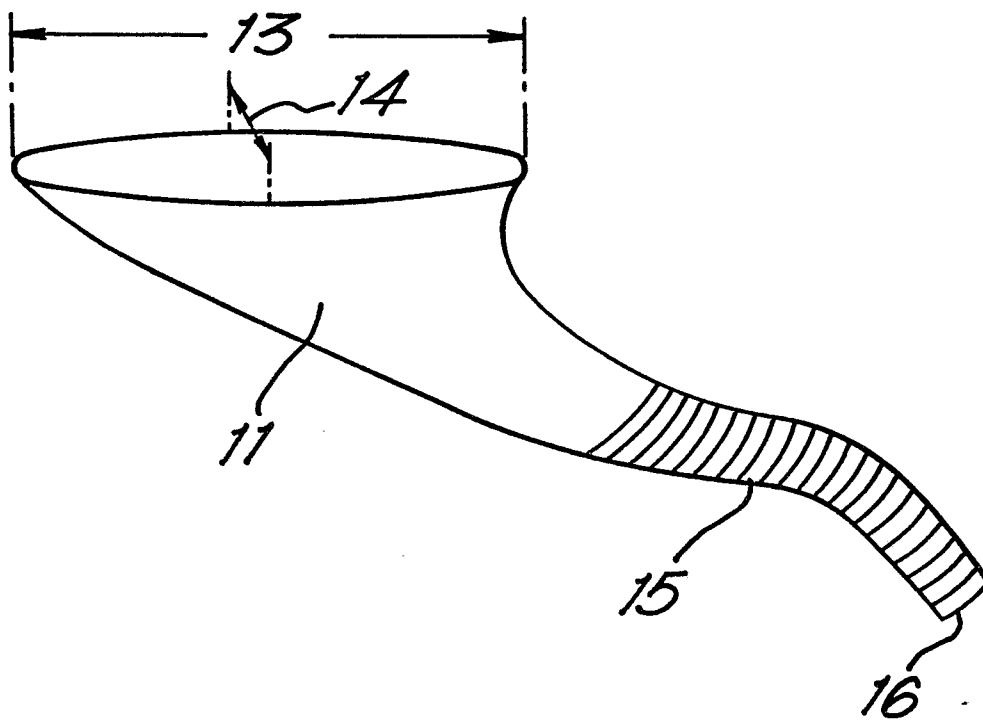
Because only very low air flow levels are used, it may occasionally be necessary to purge the system by momentarily applying a higher level of air flow to the system.

WHAT WE CLAIM IS:

1. An apparatus for drafting textile material comprising two pairs of rollers forming two consecutive nips through which the textile material passes and between which the material is drafted, and means for applying suction to the material as it passes between the nips.
2. Apparatus according to claim 1, wherein the suction means is arranged closely adjacent the material.
3. Apparatus according to claim 1 or 2, wherein the suction means comprises a nozzle located closer to the material than the common tangent of the rollers on one side of the material.
4. Apparatus according to claims 1, 2 or 3, wherein the nozzle is elongate so as to extend along a length of the material.
5. Apparatus according to any preceding claim, wherein the suction means applies suction only to the material.
6. Apparatus according to any preceding claim, wherein the suction means is arranged to develop an air flow less than 0.5 cfm.
7. Apparatus according to claim 6, wherein the suction means is arranged to develop an air flow of the order of 0.25 cfm.
8. Apparatus according to any preceding claim, wherein the pairs of rollers are the middle and back rollers of a three line apron drafting system.

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FIG.3.





European Patent
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EUROPEAN SEARCH REPORT

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Application number

EP 81 30 4730

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<u>GB - A - 910 801</u> (T.M.M.) * Whole document * --	1	D 01 H 5/66 D 01 H 1/00
X	<u>GB - A - 1 047 801</u> (ELITEX SDRUZENI PODNIKU TEXTILINHO STROJIRENSTVI) * Whole document * --	1	
Y	<u>US - A - 2 765 495</u> (J.A. BARRETT et al.) * Whole document * --	1	TECHNICAL FIELDS SEARCHED (Int.Cl. 3) D 01 H D 01 G
Y	<u>GB - A - 2 375 357</u> (TRUTZCHLER) * Whole document * --	1-5	
Y	<u>GB - A - 942 540</u> (F. REITERER, L. WINDISCH) * Whole document * --	1-5	
Y	<u>GB - A - 861 514</u> (T.M.M.) * Whole document * ----	1,2	CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document
☒ The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26-01-1982	Examiner DEPRUN