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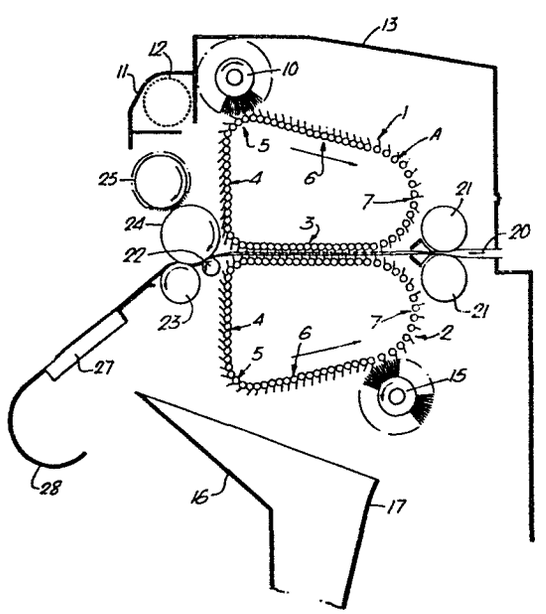
(54) **Drawing frame.**

(57) An intersecting drawing frame includes upper and lower sets of chain-mounted pinned fallers 1 and 2 respectively. A rotary cleaning brush 10 and co-operating suction device 12 are mounted at or close to the front of the path of the fallers of the upper set 1 so as to engage the fallers after they have withdrawn from the sliver being drafted. This is in contrast to the normal arrangement of the brush at the rear of the machine and leads to unexpected advantages.



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James Mackie & Sons Limited

Drawing frame

One form of textile drawing frame includes pinned fallers mounted between a pair of endless chains by means of which they are driven or carried round a closed circuit. shaped to define a generally horizontal working reach over which the sliver to be drafted is pinned by the fallers. These frames may be either of the open type, that is to say having only a lower set of fallers on which the fibres being drafted rest, or of the intersecting type with upper and lower sets of co-operating fallers so that the fibres being drafted are pinned from both below and above. It is with this second type that the present invention is concerned.

Drawing frames of this type have mainly, in the past, been used for the drafting of synthetic fibres although they have also been used to a certain extent for the drafting of wool. The treatment of these natural fibres has inevitably introduced a certain amount of dirt and it has proved necessary to include rotary brushes for cleaning the faller pins.

It has been the practice to locate these rotary brushes at the rear of the machine so that the pins are cleaned shortly before they enter the working reach and move forwardly along a generally horizontal

path towards the delivery rollers at the front of the machine. In addition, it is known to fit suction nozzles to the rear of the brushes to remove the dirt loosened from the pins by the rotary brush or brushes. Further suction devices have been fitted in the vicinity of the drawing rollers and even within the closed circuit formed by the lower faller assembly. This arrangement has proved reasonably satisfactory, although when drafting particularly dirty wool, it has been necessary to clean the brushes and the assembly as a whole at fairly frequent intervals.

Recently, however, there have been proposals to use intersecting machines of this type for the drafting of jute as described in our co-pending British application no: 2069546A. Jute fibres are much dirtier than wool and the cleaning arrangements so far described have proved quite inadequate. Despite the use of rotary cleaning brushes and suction arrangements, the faller assembly has rapidly become choked with loose fibres and fluff and this has necessitated stopping the machine for cleaning purposes at very frequent intervals.

According to the present invention, a drawing frame of the intersecting type, as referred to above, is fitted with a rotary cleaning brush mounted at or close to the front of the path of the fallers of the upper set so as to engage the fallers after they have withdrawn from the sliver being drafted, and a co-operating suction device located adjacent the brush and forwardly of it so as to receive at least a large proportion of the dirt immediately after its removal from the fallers, thus preventing it

being carried around the return section of the faller path. The apparently simple step of moving the rotary cleaning brush from the rear to the front of the machine and arranging a suction device forwardly of the brush to co-operate directly with it has a totally disproportionate effect on the efficiency of the cleaning, and even with comparatively dirty jute fibres enables the machine to run for long periods without the need to stop it for cleaning purposes.

The general path of the fallers after leaving the generally horizontal working reach extends more or less vertically to a corner defined by an idler pulley, after which the path slopes at a relatively small angle to the rear of the machine where it passes around a considerably more gradual curve before returning to the working reach. It is found that the rotary brush is most effective if located in the region of the corner at the end of the substantially vertical path since the tips of the pins open out while passing round the corner and thus provide more space for the cleaning action of the bristles of the brush. The brush is driven in a direction such that the bristles move from the roots to the tips of the pins, thus sweeping the dirt away from the bodies of the fallers, along the pins and into the suction nozzle. The bristles will, of course, engage the pins over an appreciable arc of movement, but best results are achieved when the cleaning action occurs while the pins are generally horizontal. This is not essential, however, and excellent results are achieved for any angle of the pins between 0° and 45° to the horizontal.

Although the improvement depends on the re-location of the cleaning brushes and their direct co-operation with corresponding suction nozzles, this improvement can be explained in terms of the action of the moving bristles in relation to the attitude of the pins on the fallers. The clogging action resulting from the failure to disperse the dirt in previous constructions of machine is most marked on the upper faller assembly of an intersecting machine where the pins are approaching a vertical attitude just before starting the gradual curve prior to the beginning of the working reach. Although the bristles of the cleaning brush move in a direction such as to tend to sweep the dirt away from the bodies of the fallers and along the length of the pins, the fact that the pins are nearly vertical at this point inhibits this effect and much of the dirt removed from the pins becomes embedded in the bristles of the brush so as to cause it to progressively lose its effectiveness.

Furthermore, because the brush is located to the rear of and above the faller path and of necessity must rotate in the opposite direction to the movement of the fallers, much of the dirt swept clear of the pins and the brush settles back on to the top of the fallers again so as to be conveyed back into the nip formed between the brush and the fallers, hence the brush rapidly becomes completely choked.

The gap between adjacent fallers is either very small or non-existent over most of the faller path but it opens out rather more as the fallers pass

around the relatively large curve at the rear of the assembly before the fallers re-enter the working reach. When the brush becomes choked with dirt it acts to press the dirt and fluff resting on the fallers through the tapered spaces between the fallers at this point so as to fill the space enclosed by the faller track and this dirt eventually becomes so compacted as to act as a brake on the moving fallers and place such a strain on the mechanism as to cause it to seize with consequent breakage of parts.

The effect is most marked on the upper faller assembly where the pins are extending upwardly at the point of cleaning and the brush rests on top of the fallers. On the lower faller assembly, the pins extend downwardly at the point of cleaning so that the dirt is more inclined to drop away from the fallers. Consequently, although the fitting of the brush at the front of the lower faller assembly is by no means excluded, the conventional arrangement of brush at the rear of the machine, where more space is available, is found to be quite adequate.

An example of a machine in accordance with the invention will now be described in more detail with reference to the accompanying drawing which is a diagrammatic sectional view.

The machine comprises an upper faller assembly indicated generally as 1 and a lower faller assembly indicated generally as 2, each defining a closed path including a horizontal working reach 3. The upper assembly 1 runs in a clockwise direction and the lower assembly 2 in an anti-clockwise direction and, after reaching the front of the machine, each assembly moves away along a vertical path 4. The driving pinion and idler pinions are omitted for sake of simplicity, but at the end of each vertical path 4, each assembly passes around a corner 5 and then along a path 6 which slopes back towards the rear

of the machine, the fallers passing around a relatively large curve 7 before re-entering the working reach 3. The cleaning brushes have previously always been situated to the rear of the faller assembly, (i.e. the right hand side as seen in the drawings). Thus on the upper assembly, cleaning has previously been carried out in the region indicated as A where the pins are substantially vertical and the fallers spaced apart and difficulties arise as previously described. In a construction in accordance with the invention, as illustrated, a rotary cleaning brush 10 is situated at the front of the machine so as to engage the pins at the corner 5 as they move through an angle close to the horizontal to an angle in the region of 45° to the horizontal. The brush is driven to rotate in a clockwise direction so that it sweeps along the tops of the fallers and along the pins from their roots to their tips, throwing out the dirt to the left in a generally horizontal direction so that a large proportion of it is received by a suction hood 11 to the front of the brush, connected to a duct 12.

As previously explained, the effect of the dirt is very much greater on the upper assembly 1 than on the lower assembly 2 and for this reason a cleaning brush 15 which rotates in an anti-clockwise direction is shown at the rear of the lower assembly 2. Dirt thrown off the pins and fallers of the assembly by the brush 15 passes to a hopper 16 leading to a suction duct 17. The hopper is positioned forwardly of the brush

and extends below a major part of the length of the faller path and beyond so that dirt wiped from the pins will be projected towards the mouth of the hopper. The extended width of the hopper results in it also catching any dirt falling from the drawing rollers. Although improved results could be obtained by locating the brush 15 towards the front of the faller assembly 2, the effect of the dirt on the lower assembly is so much less that, over any particular period of operation, approximately as much dirt accumulates on the brush 15 at the rear of the lower assembly as it does on the brush 10 at the front of the upper assembly and the two thus require cleaning at approximately equal intervals.

The remainder of the machine is constructed generally in accordance with normal practice. Sliver to be drafted enters the rear of the machine as indicated by the arrow 20 and passes between a pair of feed rollers 21 to the working reach 3 defined by the intersecting pins of the upper and lower faller assemblies 1 and 2 respectively. After leaving the working reach 3, the sliver passes to drawing rollers 22, 23 and 24, the last of which, the pressing roller, is engaged by a cleaning roller 25 so as to maintain its surface free of dirt. The sliver then passes to a doubling plate 27 before reaching the delivery rollers (not shown) which are enclosed by a curved cover 28. By virtue of the improved cleaning arrangement in accordance with the invention,

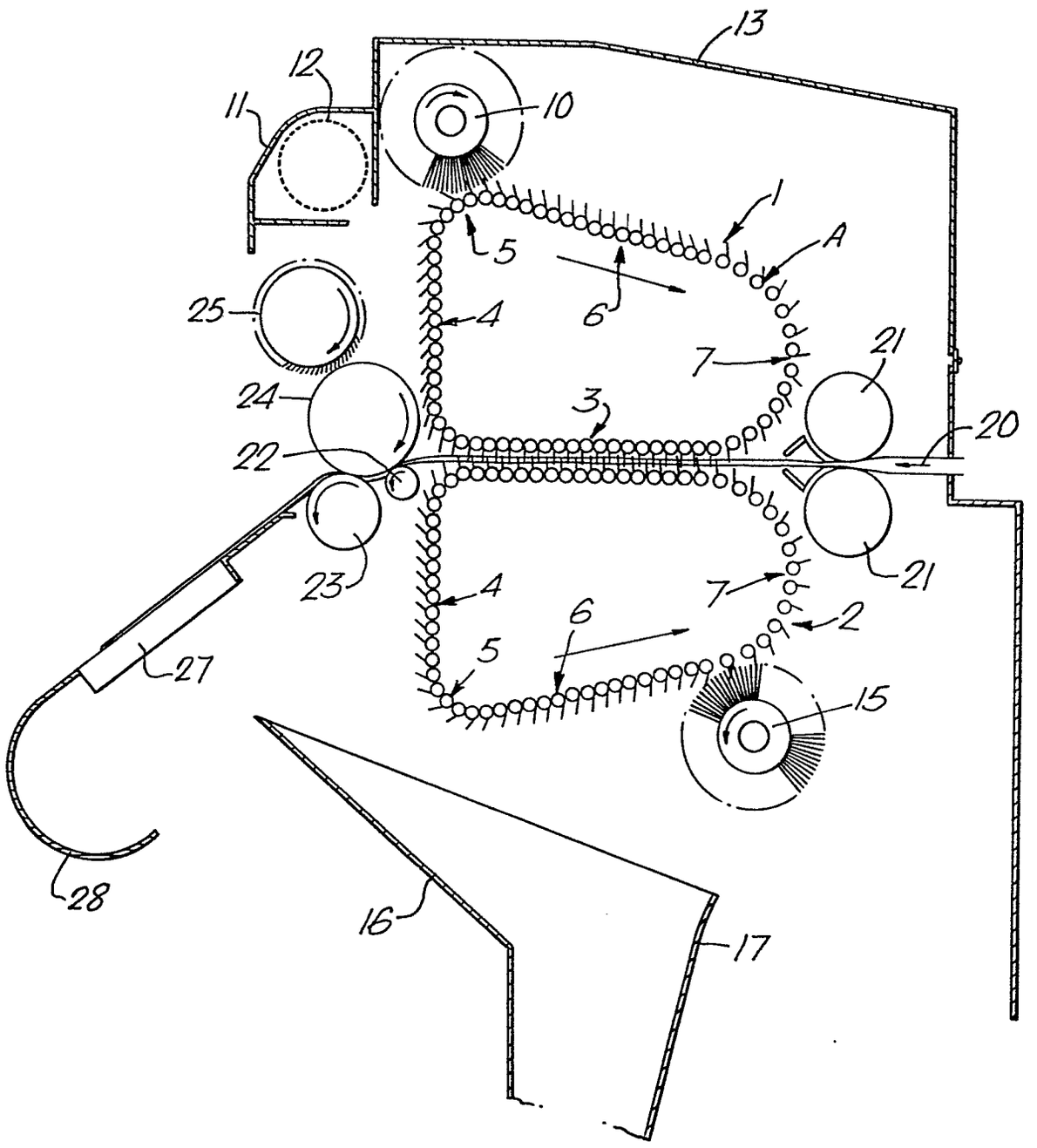
it is possible to run the machine for very much longer periods without the need to stop it for cleaning purposes and, in addition, the emerging sliver is itself very much cleaner.

C L A I M S

1. A textile drawing frame of the intersecting type including sets of pinned fallers mounted between respective pairs of driven endless chains for carrying the fallers round a closed circuit shaped to define a generally horizontal working reach over which the pins of the upper and lower sets of fallers intersect to pin sliver to be drafted and also comprising a rotary cleaning brush mounted at or close to the front of the path of the fallers of the upper set so as to engage the fallers after they have withdrawn from the sliver being drafted, and a co-operating suction device located adjacent the brush and forwardly of it so as to receive at least a large proportion of the dirt immediately after its removal from the fallers.

2. A textile drawing frame according to claim 1 in which the rotary brush is located in the region of a corner at the end of a substantially vertical part of the path followed by the fallers after leaving the working reach.

3. A textile drawing frame according to claim 2 in which the rotary brush is so located that the cleaning action occurs while the pins are generally horizontal.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EUROPEAN SEARCH REPORT

Application number

EP 82 30 2647

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	DE-C- 526 518 (A. ROEDER) * the whole document *	1	D 01 H 5/64
A	FR-A-2 306 284 (COGNETEX) * the whole document *	1,2	
A	TEXTILE PRAXIS, vol.27, no.10, Oktober 1972 "Maschinen und Verfahren", page 92 * page 92, right-hand column *	1,2	
A	US-A-3 534 427 (XEROX CORP.) * column 4, lines 70-75; column 5, lines 1-35; figure 3 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl. ³)

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	08-09-1982	DEPRUN M.

CATEGORY OF CITED DOCUMENTS

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