Feb. 4, 1964 F. REITERER 3,120,030

CARDING MACHINES FOR TEXTILE FIBRES

Filed Jan. 23, 1961 2 Sheets-Sheet 1

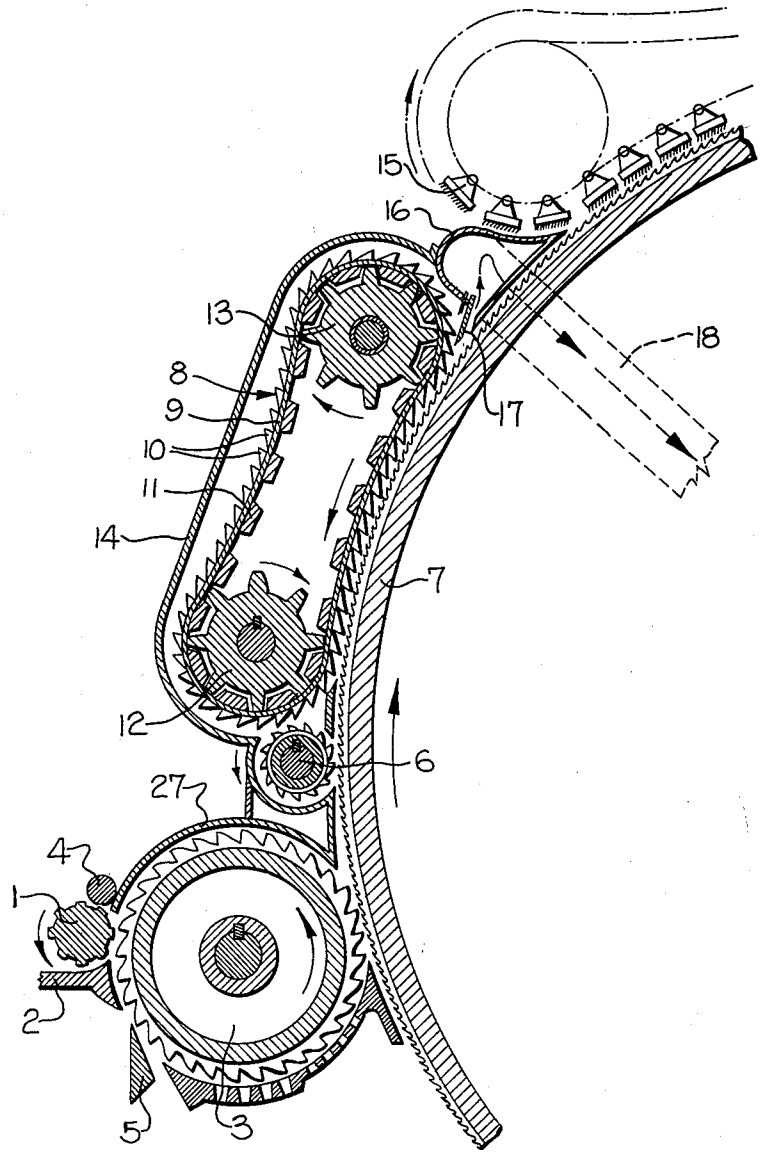


Fig-1

INVENTOR:
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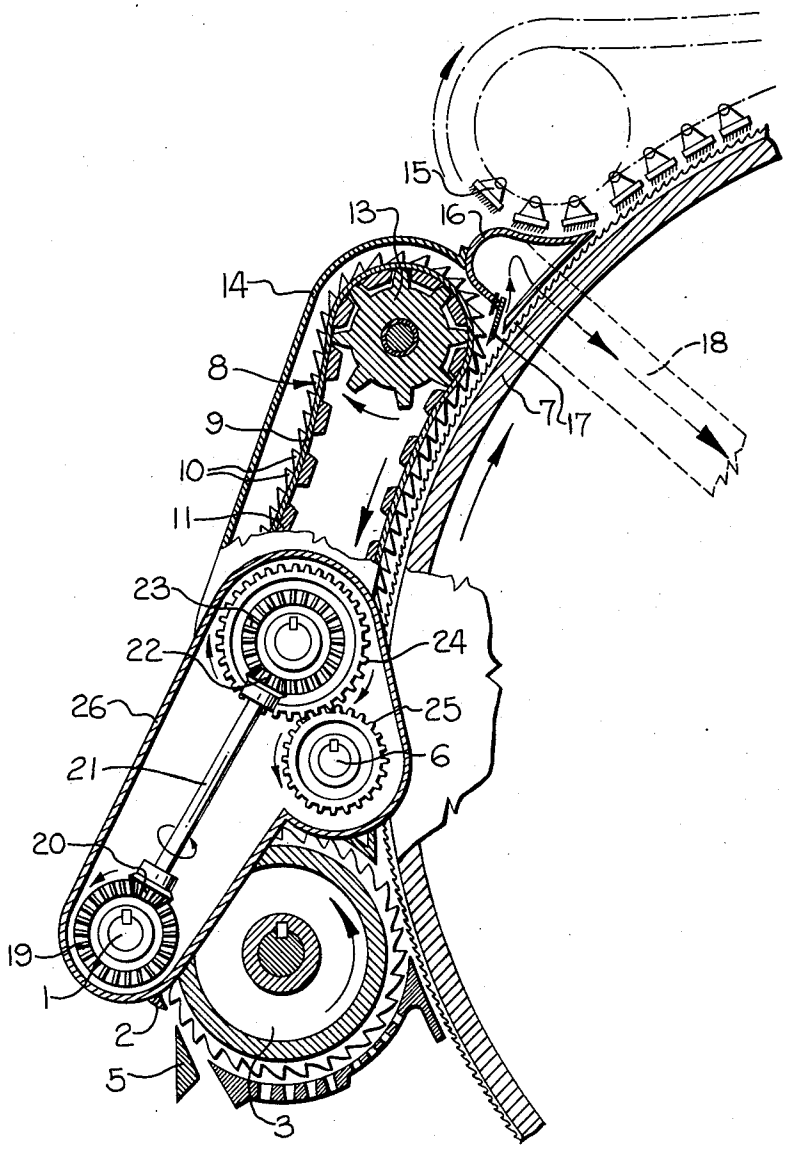


Fig-2

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3,120,030

CARDING MACHINES FOR TEXTILE FIBRES

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9 Claims. (Cl. 19—105)

The present invention relates to carding machines for textile fibres.

It is known that in such machines fibres are brought in the form of a feed lap, or sheet, to a first toothed roller or cylinder known as a licker-in and then to the periphery of a cylinder provided with projecting parts and called the main cylinder or swift, the latter co-operating with a means called a traveling flat which is substantially tangential to the swift. After the fibres have been subjected to the action of the licker-in, the swift and the traveling flat, they are condensed on a doffer and detached from the latter by a vibrating doffing comb so as to form a web or fleece and are then gathered together in a sliver by means of a funnel and calenders.

Increase in output and the improvement of the quality of the web or fleece depend, in large part, on the degree of opening of the feed lap and on the cleaning of the fibres effected by the licker-in, these being preparatory operations which are essential and of great importance for the carding proper, effected by the co-operation of the swift and the traveling flat.

The fibres in the feed lap are intermingled and the opening thereof by the licker-in must be carried out in such manner that the fibres detached in continuous fashion by the clothing of the licker-in are carried to the swift in the form of small tufts of as small a volume as possible.

It is necessary, moreover, in order to obtain a clean web and take care of the clothing of the swift and of the traveling flat, that the licker-in should expel the maximum possible quantity of coarse impurities such as the remains of leaves, dead fibres, etc. which have not been eliminated by the scutchers.

The capacity of the conventional licker-in for opening and cleaning the feed lap is limited because of the very nature of this member. In fact, it is impossible to exceed a certain speed of feed without running the risk of doing harm to the quality of the web.

With the object of improving the efficiency of the carding process, attempts have been made to effect increasing of the speed of rotation of the licker-in. This method has not given satisfactory results because, in addition to the mechanical difficulties, the very rough action of the teeth of the licker-in weakens and shortens the fibres.

Consideration has also been given to adding one or two worker rollers at the lower periphery of the licker-in. This arrangement provides an improvement in the disentangling and cleaning of the fibres, but it has other drawbacks. In fact, since these worker rollers are placed on the lower portion of the licker-in, they are necessarily disposed in the wastebox and therefore in an atmosphere charged with dust. Moreover, owing to the need to keep said waste box closed, these rollers cannot be checked visually and the adjustment thereof presents many difficulties because of their poor accessibility.

It is an object of the present invention to provide a carding machine in which the disentangling and cleaning of the fibres is substantially improved without the drawbacks indicated above.

A carding machine for textile fibres, according to the present invention, comprises a feed roller, a main licker-in arranged to receive a lap of fibres from the feed roller,

a swift arranged in relation to the licker-in to receive the lap of fibres therefrom, and at least one secondary licker-in disposed in the path of the lap of fibres received on the swift from the main licker-in so as to engage the lap of fibres on the swift.

Suitably, driving means are provided to effect driving of the secondary licker-in in synchronism with the feed roller.

The accompanying diagrammatic drawings show, by way of example only, one form of construction of a carding machine according to the invention.

FIGURE 1 is a general sectional view of a carding machine and FIGURE 2 is a view similar to FIGURE 1 showing a form of driving means for the secondary licker-in.

In the drawings, the reference **1** designates the fluted feed roller co-operating with the dish feed plate or feeding trough **2** to carry the lap of fibres to the main licker-in **3**. The latter is covered, over its upper portion, by a protective casing **27**, the fluid-tightness thereof being ensured by a sealing roller **4**. A scraper knife **5** is disposed on the lower portion of the licker-in **3** to detach the coarse impurities. A clearing roller **6** provided with teeth is located between the licker-in **3** and a secondary licker-in, the latter being designated as a whole by the reference **8**. The secondary licker-in **8** consists of an endless flexible band or belt **9** carrying on its outer surface a certain number of teeth **10**. On its inner surface, the band **9** carries a certain number of blocks **11** which enable it to mesh with two grooved sprocket wheels **12** and **13**, one of which is a driving wheel.

The whole of the secondary licker-in **8** is enclosed, together with the clearer roller **6**, in a casing **14**.

At the exit of the casing **14**, between the secondary licker-in **8** and a traveling flat **15**, there is a suction chamber **16**, an inlet orifice of which is provided with an adjusting lip **17** and connected by a duct **18** to an extractor fan (not shown).

The teeth of the secondary licker-in **8** are preferably finer than those of the main licker-in **3**.

The supporting means of the secondary licker-in constituted by the casing **14** and also its driving mechanism (hereinafter described) are vertically adjustable with respect to the swift **7**, so as to enable the distance between the teeth of the secondary licker-in and those of the swift to be varied.

The blocks carried on the endless band of the secondary licker-in and enabling said band to be driven are rigid, being made, for example, of steel. The band of the secondary licker-in **8** is arranged in relation to the swift so that the run of the band adjacent the swift remains parallel to the swift.

The air set in motion by the swift **7** creates a compression between the periphery of said swift and the band of the secondary licker-in **8** and, owing to the seal ensured by the band, which is impervious, supporting the teeth, the air compressed in this way can escape only through the suction orifice mentioned above and this ensures excellent expulsion of the dust impurities.

Any fibres which may possibly remain attached to the teeth of the secondary licker-in are detached by means of the clearer roller **6** which is provided with projecting teeth and has a circular speed about 5% higher than that of the aforesaid secondary licker-in **8**. The fibres detached in this way are removed from the clearer roller **6** by the clothing of the swift, the circular speed of which is much greater and, as a result, they are subjected afresh to the carding action.

FIGURE 2 shows a form of driving device for driving the secondary licker-in in synchronism with the feed roller.

On the shaft of the feed roller **1** there is keyed a bevel pinion **19** with which meshes a bevel gear **20** mounted

on one end of an auxiliary shaft 21. At the other end of the latter there is mounted a second bevel gear 22 meshing with a bevel pinion 23 keyed on the shaft of the driving wheel 12 of the second licker-in. Moreover, to this shaft there is also keyed another pinion 24 meshing with a pinion 25 keyed on the shaft of the clearer roller 6. The assembly is arranged in a casing 26.

Of course, any other mechanical connection arrangement between the feed roller, on the one hand, and the driving wheel of the secondary licker-in and the clearer roller, on the other hand, could be used without departing from the scope of the invention. The same applies to the number and nature of the secondary lickers-in, which could be constructed in forms other than a toothed flexible band.

What I claim is:

1. A carding machine for textile fibres, comprising a main licker-in arranged to receive a lap of fibres, a swift arranged in relation to the licker-in to receive the lap of fibres therefrom, and at least one secondary licker-in disposed in the path of the lap of fibres received on the swift from the main licker-in so as to engage the lap of fibres on the swift, the secondary licker-in comprising a member having a continuous impervious outer surface with teeth mounted thereon movable closely adjacent to the periphery of the swift whereby a current of air set in motion by rotation of the swift is confined between the member and the swift.

2. A carding machine as claimed in claim 1, wherein the teeth on the secondary licker-in are finer than those on the main licker-in.

3. A carding machine as claimed in claim 1, wherein at the end of the secondary licker-in remote from the main licker-in there is formed a suction orifice which is connected with an extractor fan and serves as an outlet for air and entrained dust from between the swift and the secondary licker-in.

4. A carding machine as claimed in claim 1, including a feed roller to supply a lap of fibers to the main licker-in and wherein driving means are provided to effect driving of the secondary licker-in in synchronism with the feed roller.

5. A carding machine as claimed in claim 4, wherein the secondary licker-in comprises an endless band provided on an outer surface thereof with teeth and on an inner surface thereof with rigid blocks, there being provided spaced band driving and driven sprocket rollers engaged by the blocks.

6. A carding machine as claimed in claim 1, wherein there is provided a toothed clearer roller disposed between the main and secondary lickers-in which serves to remove fibers from the secondary licker-in and return the removed fibres to the swift.

7 A carding machine as claimed in claim 6, wherein driving mechanism associated with the clearer roller is adapted to drive that roller at or approximately at 5% above the speed of the secondary licker-in.

8. A carding machine as claimed in claim 6, including a feed roller to supply a lap of fibers to the main licker-in and wherein the secondary licker-in and the clearer roller are driven from the shaft of the feed roller through an auxiliary shaft one end of which is geared to the feed roller shaft while the opposite end thereof is geared both to the secondary licker-in and the clearer roller.

9. A carding machine as claimed in claim 6, wherein the secondary licker-in and clearer roller are disposed within a common casing.

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