

Dec. 31, 1963

F. REITERER

3,115,683

CARDING MACHINES FOR TEXTILE FIBRES

Filed Jan. 23, 1961

6 Sheets-Sheet 1

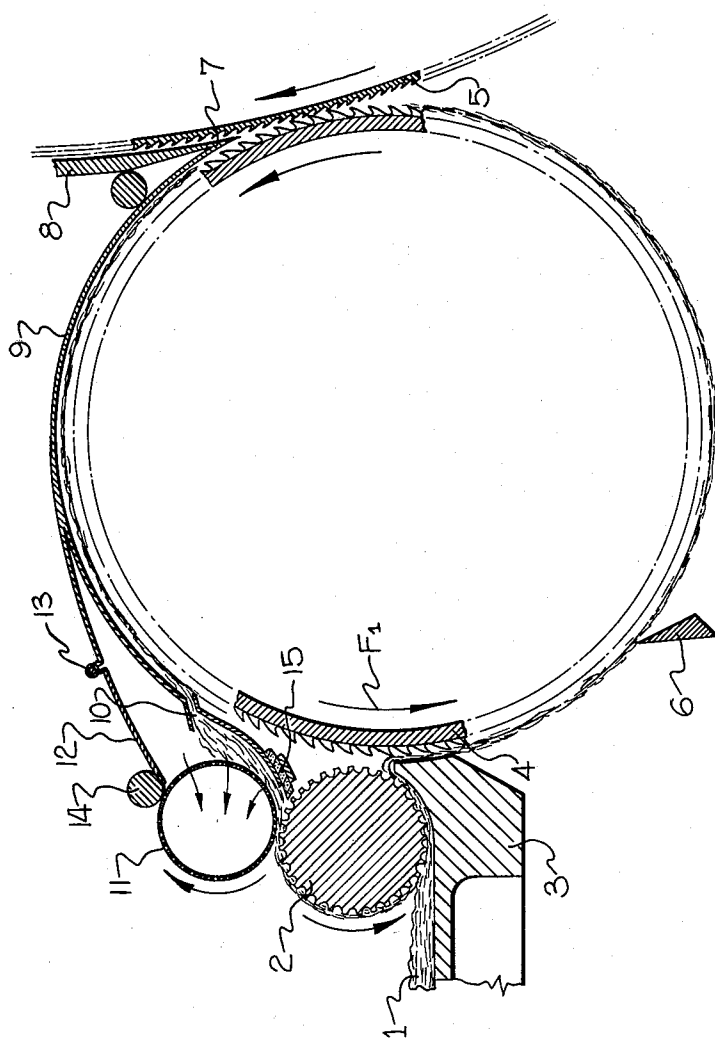


FIG. 1

INVENTOR:
FERDINAND REITERER

BY *Eaton, Bell, Hunt & Bell*

ATTORNEYS

Dec. 31, 1963

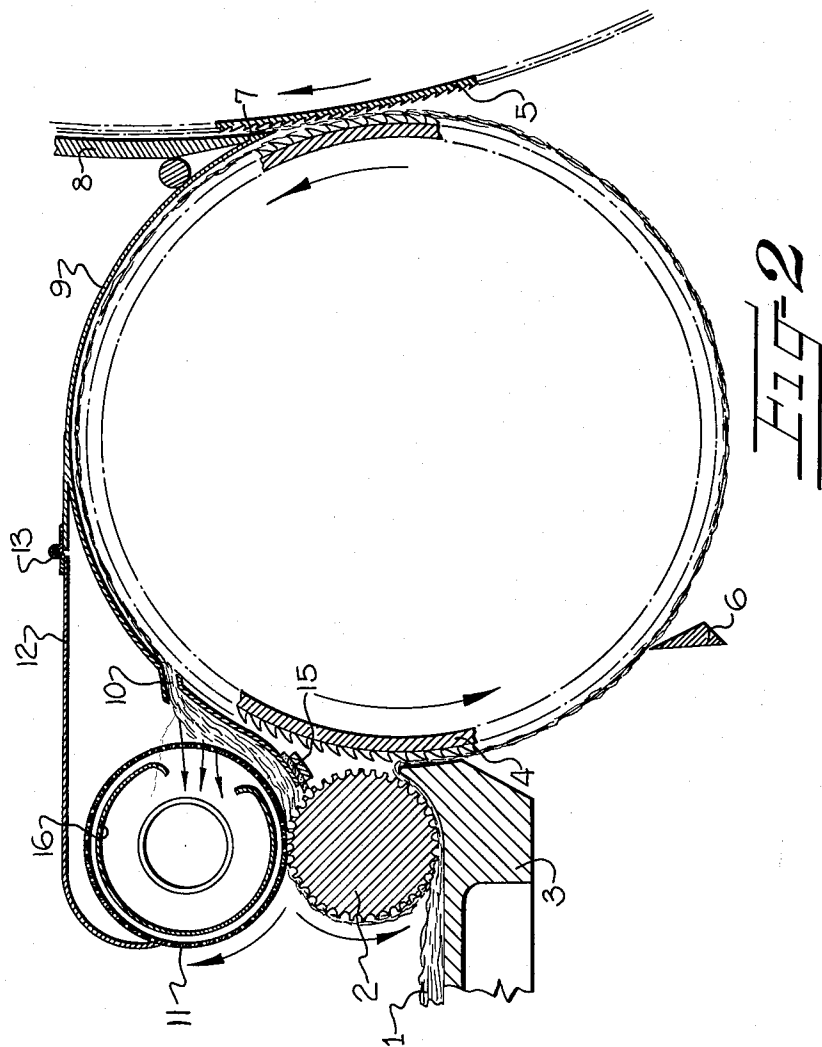
F. REITERER

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CARDING MACHINES FOR TEXTILE FIBRES

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6 Sheets-Sheet 2



INVENTOR:
FERDINAND REITERER

BY *Eaton, Bell, Hunt & Seliger*

ATTORNEYS

Dec. 31, 1963

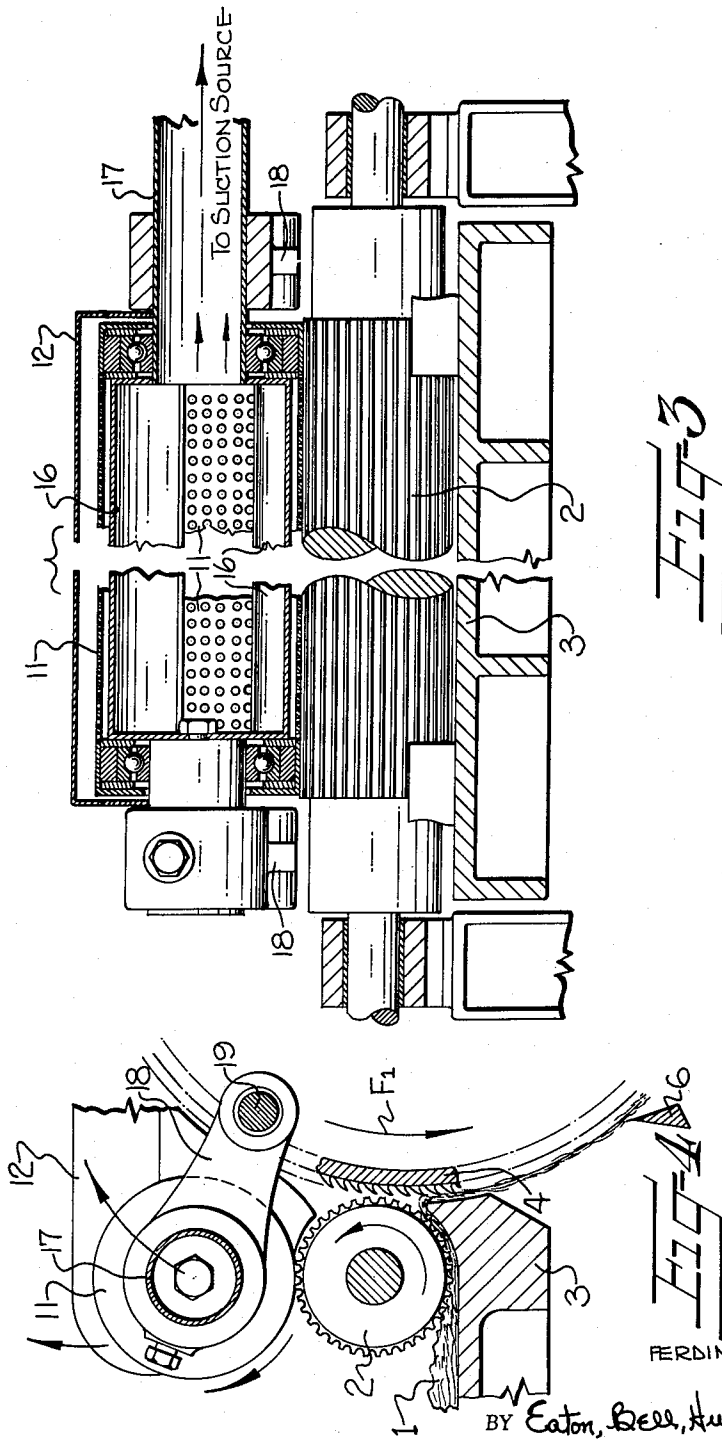
F. REITERER

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CARDING MACHINES FOR TEXTILE FIBRES

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6 Sheets-Sheet 3



INVENTOR:

FERDINAND REITERER

BY *Eaton, Bell, Hunt & Deltzer*

ATTORNEYS

Dec. 31, 1963

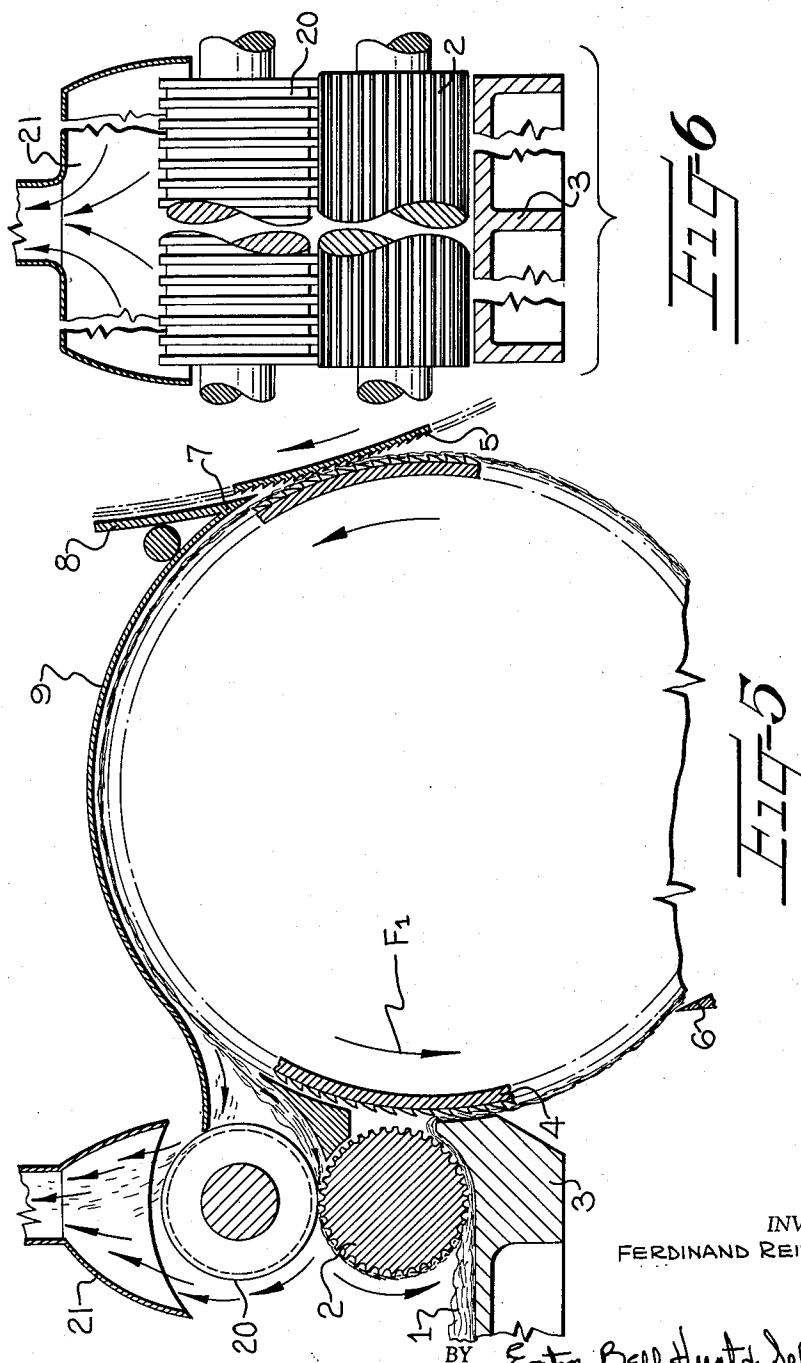
F. REITERER

3,115,683

CARDING MACHINES FOR TEXTILE FIBRES

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6 Sheets-Sheet 4



INVENTOR:
FERDINAND REITERER

BY *Eaton, Bell, Hunt & Selzer*
ATTORNEYS

Dec. 31, 1963

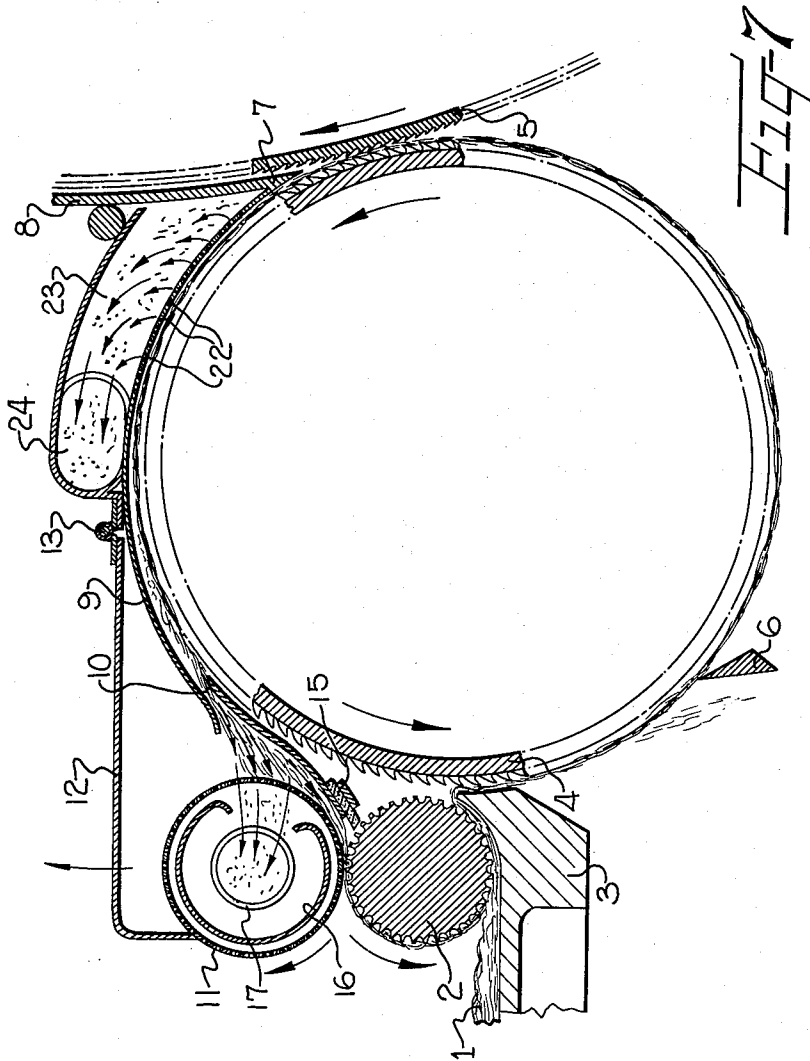
F. REITERER

3,115,683

CARDING MACHINES FOR TEXTILE FIBRES

Filed Jan. 23, 1961

6 Sheets-Sheet 5



INVENTOR:
FERDINAND REITERER

BY *Eaton, Bell, Hunt + Deltge*

ATTORNEYS

Dec. 31, 1963

F. REITERER

3,115,683

CARDING MACHINES FOR TEXTILE FIBRES

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6 Sheets-Sheet 6

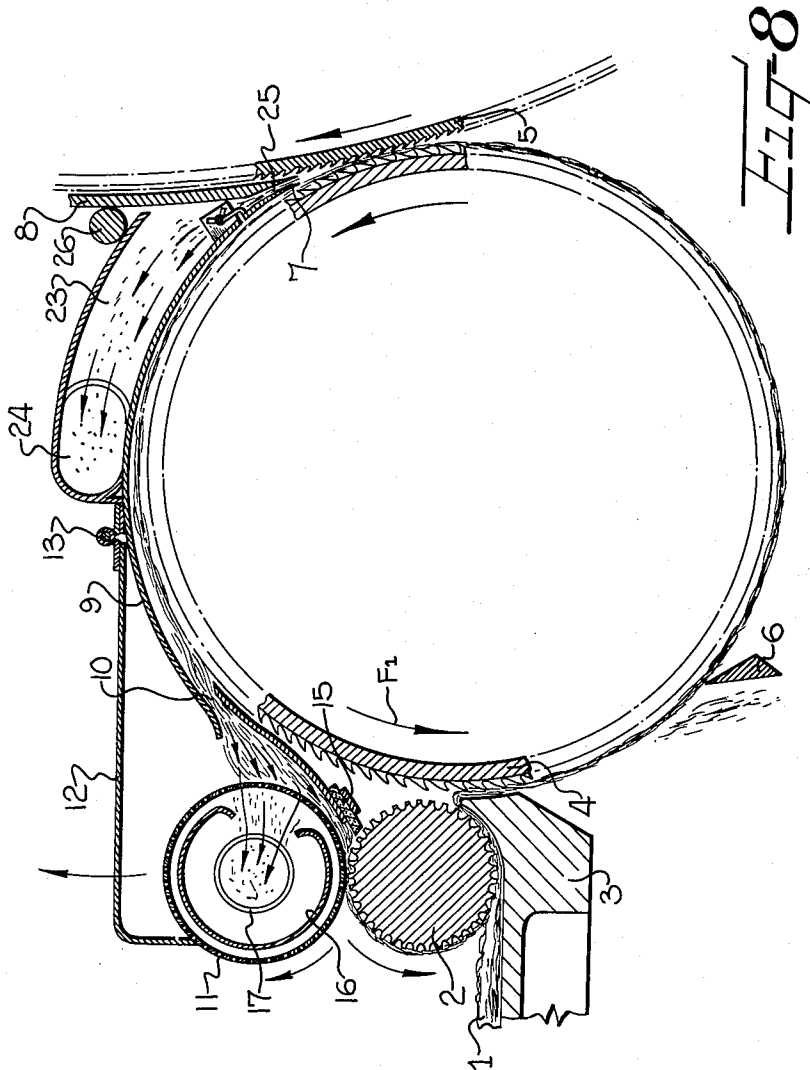


Fig. 8

INVENTOR:
FERDINAND REITERER

BY *Eaton, Bell, Hunt & Selzer*

ATTORNEYS

1

3,115,683

CARDING MACHINES FOR TEXTILE FIBRES

Ferdinand Reiterer, Rueil-Malmaison, France, assignor,
by direct and mesne assignments, to Whitin Machine
Works, Whitinsville, Mass., a corporation of Massa-
chusetts

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Claims priority, application France Jan. 21, 1960
15 Claims. (Cl. 19—105)

This invention relates to carding machines for textile fibres.

In known forms of such machines there is provided a roller equipped with toothed clothing, known as a licker-in, which exerts a first cleaning action on the fibres which have been gathered together to form a lap by a scutcher, the lap being conveyed to the licker-in by a feed roller. In practice, the teeth of the licker-in penetrate to a certain depth into said lap or sheet of fibres, which is pressed between the feed roller and a plate known as a feeding trough or dish feed plate, and detach the coarse impurities from said lap, these being stopped by a scraper knife disposed adjacent a lower part of the periphery of the licker-in. The fibres cleaned in this way are transported by the licker-in towards a cylinder provided with teeth and known as the main cylinder or swift, which detaches them from the licker-in and draws them to a certain extent, since it has a peripheral speed greater than that of the licker-in and a larger number of teeth.

However, the fibres conveyed in this way to the swift by the licker-in, although freed from a certain quantity of coarse impurities, are still looped and curled and comprise a certain proportion of short fibres. They are intermingled with one another instead of being separate and they appear on the clothing of the swift in the form of small tufts.

It is therefore essential that the carding machine be fitted with a device which equalizes the distribution of these fibres and facilitates the attachment thereof to the teeth of the swift.

A device of this kind is known which is constituted by a concave sheet metal plate, commonly known as the rear plate, disposed at a small distance from the swift parallel to the periphery of the latter. This plate terminates in a sharp edge close to the line of contact between the licker-in and the swift, it being possible for this sharp edge to be brought more or less close to the swift at will.

During operation, the surplus fibres which have not been caught up by the teeth of the swift are first retained by the edge of the rear plate and then the stream of air which is produced by the rotation of the swift forces them under a casing disposed above the licker-in, so that they are carried back by the latter to the feed lap to a point downstream in the path of the feed lap from the feed roller and the feeding trough.

The fibres taken back in this way by the licker-in, and which have already been subjected to a carding action, do not have the same density as the fibres making up the feed lap and are not intimately mixed with said lap, so that at the exit from the licker-in, they are expelled at the same time as the coarse impurities in the manner explained above, and this entails a substantial loss of material.

The construction according to the present invention enables this loss of material to be largely avoided and provides for the recovery of these fibres.

A carding machine, in accordance with the present invention, comprises a licker-in, a feed roller disposed with its axis parallel to the axis of the licker-in, a feed plate disposed below the feed roller and between which and the feed roller a lap of fibres can be fed to the licker-in, a swift disposed parallel with the axis of the licker-in and

2

on the side thereof opposite the feed roller and located sufficiently close to the licker-in as to be able to remove therefrom the lap of fibres conveyed by the licker-in, a casing disposed co-axially with the licker-in and extending thereabove between the swift and the feed roller, plate means disposed adjacent the swift between the swift and the licker-in for removing surplus material from the lap supplied to the swift and for conveying said surplus material between the casing and the licker-in and means for conveying said surplus material from the casing to the lap at a point in the path of the lap so that, before said surplus material is subjected to a further action of the licker-in, it is compressed between the feed roller and feed plate.

In one form of carding machine, according to the invention, the casing extends to a location above the feed roller.

In a further form of the invention, the casing adjacent the plate means is formed with perforations opening on the side of the casing opposite the licker-in into an auxiliary chamber which is connected with a suction device whereby short fibres and dust can be removed from the surplus material fed between the casing and licker-in.

As an alternative to this latter form, the plate means form a slot with the adjacent edge of the casing which slot communicates with an auxiliary chamber formed on the side of the casing remote from the licker-in and to which is connected a suction device whereby dust and short fibres are separated from the surplus material by the suction device.

The invention will now be described, by way of example, with reference to the accompanying diagrammatic drawings, in which:

FIGURE 1 is a view in cross-section of the simplest form of carding machine according to the invention;

FIGURE 2 is a view in cross-section of another embodiment of a carding machine according to the invention which is similar to that shown in FIGURE 1, but includes a suction device;

FIGURE 3 is an elevation, partly in section, of the machine according to FIGURE 2;

FIGURE 4 is a detail view of the machine shown in FIGURES 2 and 3;

FIGURES 5 and 6 are two views, one in cross-section and the other in elevation of a carding machine similar to that shown in FIGURE 2, but having another form of suction device;

FIGURE 7 shows a further embodiment of a carding machine incorporating a device for separating the long fibres and the short fibres and a suction device; and

FIGURE 8 shows a modified form of the machine according to FIGURE 7 having another form of device for separating the long and short fibres.

In the drawings like parts have been given the same reference numerals.

Referring first to FIGURE 1, the reference 1 designates the lap of fibres which arrives between the feed roller 2 and the dish feed plate or feeding trough 3. The licker-in is designated by the reference 4 and the main cylinder or swift by the reference 5. The incoming lap 1 is entrained by the licker-in 4 in the direction of the arrow F_1 and the coarse impurities are stopped by the scraper knife 6 and removed. The fibres purified in this way continue to be entrained by the licker-in as far as the swift 5. After the point of tangency between the licker-in and the swift, those fibres which are not caught in the teeth of the latter and entrained are stopped by the sharp edge 7 formed by the junction of the rear plate 8 and the casing 9 of the licker-in. These fibres are carried along between the licker-in 4 and its casing 9, which prevents the condensed fibres becoming wound around the licker-in and acts at the same time as a scraper. These fibres are thus guided

3

by the casing and carried back by the latter to the feed roller 2, which re-incorporates them in the lap 1. The draught of air produced by the speed of rotation of the lick-in escapes through a channel 10 in the casing 9 and is discharged through the perforations of a condenser formed by a perforated rotating hollow roller 11. Preferably, the condenser is caused to rotate by friction with the feed roller. A plate 12 articulated at 13 and connected close to the condenser 11 by a sealing bead 14 forms with the casing 9 an enclosed space into which the passage 10 opens, for the purpose of avoiding leakages of air and facilitating suction. With the same object, the end of the casing 9 carries, close to the line of tangency of the feed roller and the condenser, a second seal 15.

FIGURES 2 to 4 show a modified form of construction of the device according to FIGURE 1, in which the condenser 11 comprises a fixed internal deflector 16 which is open opposite the channel 10 and connected to a suction device 17 (see FIGURE 4). The upper plate 12, which defines the suction chamber, moreover forms at its end a scraper for clearing the condenser 11. FIGURE 3 is a view in elevation corresponding to FIGURE 2 and FIGURE 4 shows the condenser 11 fixed to the end of an arm 18 articulated to a spindle 19 so as to enable it to be rocked to the rear to permit cleaning or inspection of the condenser.

The device shown in FIGURES 5 and 6 is a modified form of construction of the device according to FIGURES 2 to 4, in which the condenser is replaced by a fluted roller 20. The hollow spaces in the fluting permit evacuation of the air and the dust and the latter is sucked up by a hood 21 disposed above the roller 20.

FIGURE 7 shows a device derived from that shown in FIGURE 2, but also permitting a separation of the long fibres and the short fibres.

To this end, the wall of the casing 9 of the lick-in comprises, close to the sharp edge 7, a series of perforations 22 opening into a chamber 23 communicating with a suction duct 24. Any short fibres which are not caught on the teeth of the lick-in are removed at the same time as the dust through the perforations 22, while the long fibres are carried back by the lick-in as far as the feed roller, as has been explained previously.

FIGURE 8 shows a device giving the same results as that illustrated in FIGURE 7, but in which the separation of the fibres is effected in a different manner. The edge between the rear plate 8 and the casing 9 of the lick-in is provided throughout its length with a slot 25, preferably of adjustable width, which communicates through the chamber 23 with the suction duct 24. A sealing bead 26 closes the chamber 23.

Owing to this arrangement, the short fibres and the dust are sucked directly into the slot 25 and removed, while any long fibres which are not caught up by the teeth of the swift but are attached to the teeth of the lick-in are carried back by the latter, under its cover 9, to a point right in front of the condenser 11, where they are subjected to a second dust-removing action, and then on to the feed roller 2 which re-incorporates them in the incoming lap. According to the invention, the width of the slot 25 and also the position of the edge 7 with respect to at least one of the two adjacent cylinders may be adjustable. This adjustment of position may be effected in various ways, either by shifting the edge vertically to bring it closer to a greater or lesser extent to the two cylinders simultaneously, or by shifting it horizontally so as to bring it closer to one of the cylinders while moving it away from the other, or again by giving said edge a variable inclination.

The choice of those forms of construction which are described above will depend on the nature of the fibres to be treated, and, in particular, on the proportion of short fibres and dust contained therein.

Finally, it is to be noted that the machine according to the invention does not involve any modification of the

4

feed roller, lick-in and swift and that it can therefore be incorporated rapidly and at low cost on any existing machine.

What I claim is:

1. A carding machine for textile fibres comprising a feed roller, a swift, a lick-in interposed between and in close proximity to the feed roller and the swift to convey a lap of fibres from the feed roller to the swift, a casing disposed adjacent to the surface of the lick-in between the swift and the feed roller formed with an opening adjacent to the feed roller to direct surplus fibre material which has not been transferred to the swift away from the lick-in, and collecting means adjacent to the opening in the casing and to the feed roller to collect the surplus material and convey it to the feed roller.

2. A carding machine as claimed in claim 1, wherein the casing extends to a location above the feed roller.

3. A carding machine as claimed in claim 1, wherein a condensing roller is so arranged in relation to the feed roller as to convey and compress the surplus material between itself and the feed roller.

4. A carding machine as claimed in claim 3, wherein the condensing roller is provided internally with a part-cylindrical deflector adapted for connection to a suction device, the deflector being arranged to receive dust removed from the surplus material by the action of the suction device.

5. A carding machine as claimed in claim 3, wherein the condensing roller is in friction driving engagement with the feed roller.

6. A carding machine as claimed in claim 3, wherein there is provided a scraper plate which engages the condensing roller to effect cleaning thereof.

7. A carding machine as claimed in claim 1 including an outer side wall part forming a chamber with the collecting means and the casing, the side wall part being mounted on a hinge so that the chamber can be opened.

8. A carding machine as claimed in claim 1, including plate means disposed adjacent to the swift between the swift and the lick-in for removing surplus material from the lap supplied to the swift and for conveying said surplus material between the casing and the lick-in and wherein the casing adjacent the plate means is formed with perforations opening on the side of the casing opposite the lick-in into an auxiliary chamber which is connected with a suction device whereby short fibres and dust can be removed from the surplus material fed between the casing and lick-in.

9. A carding machine as claimed in claim 1, including plate means disposed adjacent to the swift between the swift and the lick-in for removing surplus material from the lap supplied to the swift and for conveying said surplus material between the casing and the lick-in and wherein the plate means form a slot with the adjacent edge of the casing which slot communicates with an auxiliary chamber formed on the side of the casing remote from the lick-in and to which is connected a suction device whereby dust and short fibres are separated from the surplus material by the suction device.

10. A carding machine as claimed in claim 9, wherein the width of the slot is adjustable.

11. A carding machine as claimed in claim 9, wherein the plate means are adjustable horizontally.

12. A carding machine as claimed in claim 9, wherein the plate means are adjustable vertically.

13. A carding machine as claimed in claim 9, wherein the inclination of the plate means is adjustable.

14. In a carding machine having a feed roller, a swift, a lick-in interposed between and located in close proximity to the feed roller and the swift, and means directing a lap of textile fibres to the feed roller whereby the fibres are fed to the lick-in and transferred in part to the swift, the combination therewith of means to remove from the lick-in substantially all those fibres remaining thereon following transfer of fibres from the lick-in to the swift

including diverting means interposed between the licker-in and the feed roller to divert fibres from the licker-in toward the feed roller and collecting means to collect fibres so removed and convey them back to the feed roller.

15. A carding machine as claimed in claim 14, where-
in the collecting means comprises a circumferentially
fluted condensing roller disposed adjacent to and above
the feed roller and including a hood disposed above the

condensing roller adapted for connection to a suction device.

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