Dec. 30, 1969 JEAN-FRÉDÉRIC HERUBEL 3,486,199

COMBING MACHINE

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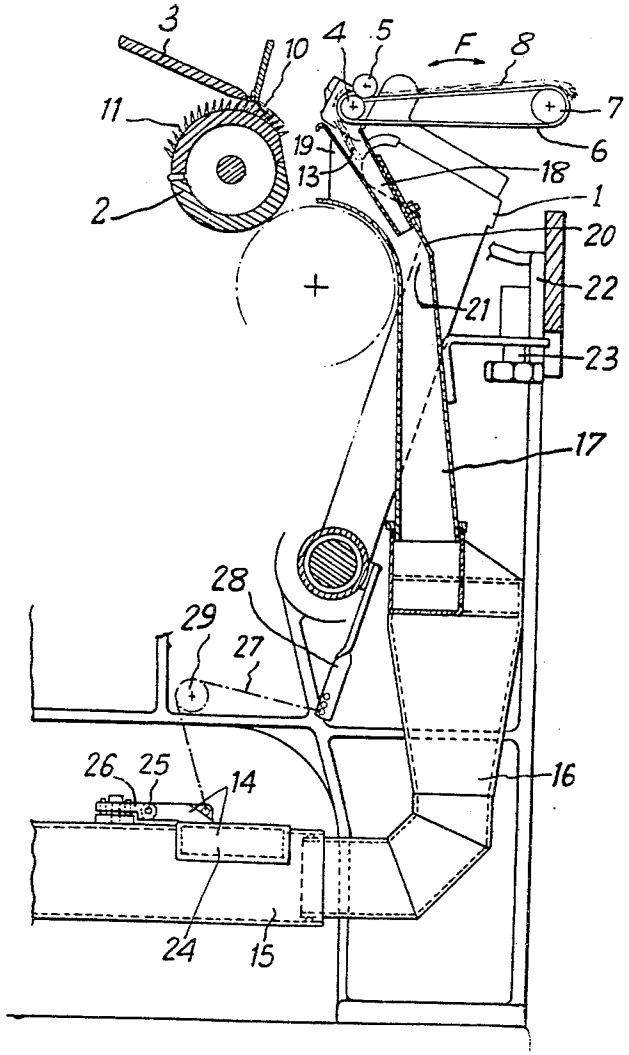
Fig. 1



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COMBING MACHINE

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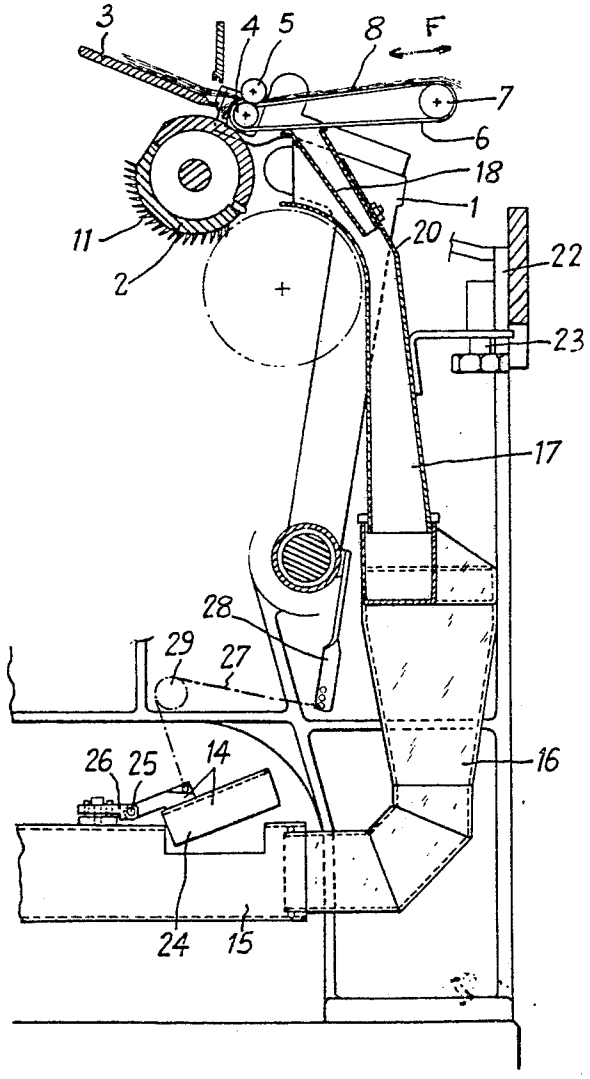
Fig. 2



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COMBING MACHINE

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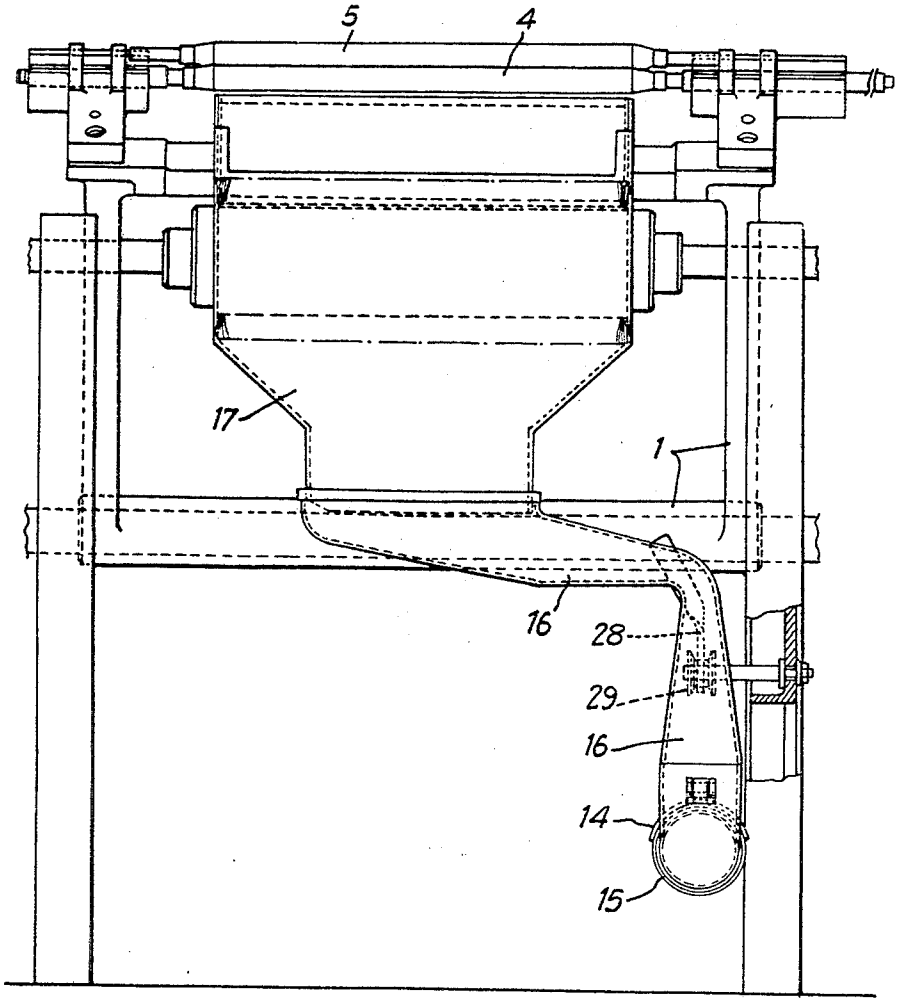
Fig. 3



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COMBING MACHINE

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Fig. 4

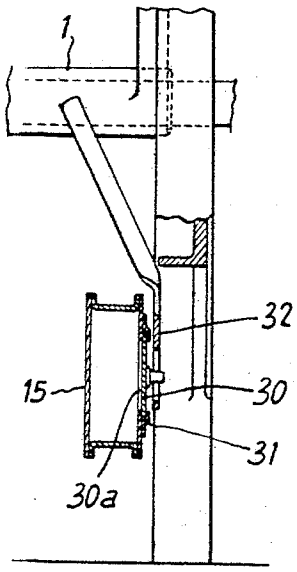


Fig. 5

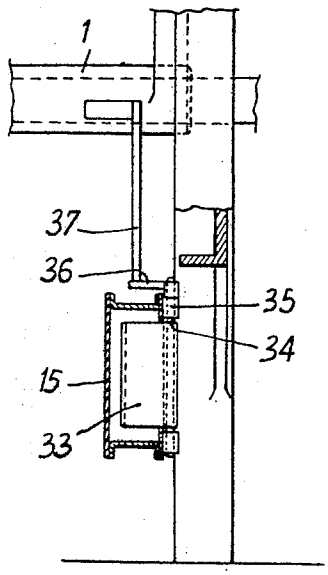
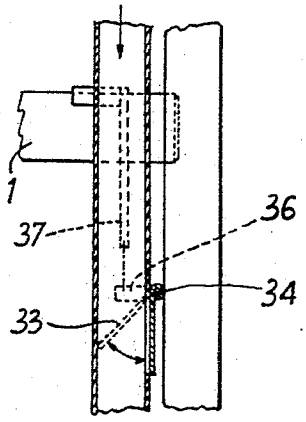


Fig. 6



United States Patent Office

3,486,199
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3,486,199

COMBING MACHINE

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Int. Cl. D01g *19/14*
U.S. Cl. 19—230 6 Claims

ABSTRACT OF THE DISCLOSURE

A device for controlling the trailing end of a previously combed web part in a combing machine to facilitate transfer of fibres to a detaching unit, the device comprising a suction funnel connected to suction means and including closure means disposed between the mouth of the funnel and the suction means for controlling the flow of air into the funnel and thereby control the action of the device.

The present invention is concerned with rectilinear or straight combing machines and more particularly with suction devices adapted to control the end of the web already combed by the machine to facilitate transfer of the fibres in course of combing from the nipper of the machine to the attaching unit.

Such a device is already known in which the device comprises a suction tube and the supply of air drawn in by the tube may be modified according to the position of the detaching carriage of the machine.

The present invention is concerned with means to ensure proper control of the supply of air drawn in and with the arrangement for flow of the air.

According to the present invention, the supply of air drawn in through the mouth of the suction tube can be reduced or made zero by the positive control of a closing device such as a flap valve, a slide valve or other means disposed between the said mouth and the suction source.

The opening or closing movement of the closure member may be effected while the detaching unit approaches the nipper or while the detaching unit moves away from the nipper.

The control device of the closure members may be arranged so as to be able to control the opening of the closure means at any moment of the working cycle of the detaching carriage in order to subject the end of the web to maximum suction at the most favorable moment of the transfer.

The suction may be arranged to be a maximum at the commencement of the approach of the detaching unit to the nipper. Further, the opening and closing movement of the closure means may be progressive or instantaneous.

The closure means may be disposed at a point in the pneumatic circuit sufficiently removed from the working members to avoid any extraneous suction at this level which might cause sucking in of fibres or fluff at the closure means.

The control of the closure means may be effected from a turning or oscillating member moving in synchronization with the detaching unit or in a general manner from any positively controlled member of the machine.

Mouth pieces of a shape suitable for the material to be worked may be mounted on the suction tube and deflectors may be mounted level with the mouth of the suction tube in order to channel the flow of air in respect of the combing members.

The suction tube may be of such shape that it has a permanent opening under the mouth so as to create a slight suction at the level of the working members of the machine.

Experience has shown that by varying the supply of air during the detaching phase, the web of fibres is distinctly improved. The elimination of the good fibres by sucking them into the recovery circuit for the fluff is rendered nil or reduced.

In addition, the fact of varying the supply of air during each detaching phase, that is to say, at a relatively high frequency given by the rapid working frequency of the machine accentuates the flow in the inside of the conduit and promotes the displacement of dust while preventing the formation of deposits therein.

On the other hand, the web, and more particularly its end, during the bringing together phase, is arranged following the decrease of the suction. Due to this fact the web is spread out regularly over the whole working width and is favorably disposed for subsequent recovery.

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

FIG. 1 is an elevation view, in partial section, of a suction device according to the invention, the detaching carriage being in a position away from the nipper;

FIG. 2 is a view similar to that of FIG. 1 but with the detaching carriage in the detaching position;

FIG. 3 is a front view of the device of FIGS. 1 and 2;

FIG. 4 shows diagrammatically another form of closure member in the form of a slide valve which can be used in the machine of FIG. 1; and

FIGS. 5 and 6 show diagrammatically in elevation and in plan respectively a further alternative form of closure member in the form of a flap.

As is known, in machines of the kind in French Patent No. 1,057,971, a detacher carriage **1** mounted to carry out movements towards and away from the circular comb **2** and the nipper **3** in the direction of the double arrow F (FIG. 1) carries detaching cylinders **4** and **5** between which an endless leather belt **6** passes guided at one end by a cylinder **7**. The endless leather belt **6** supports the web of fibres **8** previously combed.

FIGURE 1 represents the combining phase of the fibre heads **10** during which phase these latters are presented by the nipper **3** to the needle segments **11** of the circular comb **2**. The detaching carriage **1** is shown in the drawn back position in FIG. 1 so that the detaching cylinders are at their maximum distance from the combing unit.

Due to the suction effect exercised by the tube **17**, the end **13** of the web supported by the endless leather belt **6** is applied closely to the periphery of the lower detaching cylinder **4**. It remains applied to the endless leather belt **6** so as not to be capable of being engaged by the circular comb **2**.

After the combing of the fibre heads, the detaching carriage commences to approach the combing unit. From this moment the suction on the ends of the fibres is decreased by the progressive opening of the flap **14**.

During the detaching phase shown in FIGURE 2 the flap **14** is in the maximum open position and the suction is reduced or rendered nil according to requirements.

The pneumatic device in the machine according to the invention further comprises suction conduit **15**, the collector **16** on which is mounted an upper tube **17** provided with the mouth piece **18**.

In FIGURE 1 the upper tube is slightly bent and has a relatively large opening **19** directed towards the circular comb **2** producing at this level a slight suction to take up dust. It should be noted that this opening **19** has such proportions and is in such a position that the air flow into the opening **19** is without effect on the circular comb **2**.

The actual mouth piece **18** permitting the control of the end of the web is mounted in the upper tube **17** fixed on the wall **20** so that the lower part of the mouth piece **18** is at the level of a constriction **21** in the tube **17**.

The upper tube **17** and the mouth piece **18** are secured to the frame **22** of the machine by the fixing means **23** which permits easy dismantling.

The suction conduit **15** mounted in front of the collector **16** is provided with an opening **24** which can be closed by the said flap **14** hinged around its wall **25** fixed on an adjustable support **26.**

The opening and closing of the flap is controlled by a chain **27** fixed on a bar **28** secured to the lower part of the carriage **1.** The chain passes over a guide roller **29.**

FIG. 4 shows an alternative form of closure member in which the pivoting flap **14** of FIGS. 1 to 3 is replaced by a slide valve **30** sliding in guides **31** in front of an opening **30***a* in a wall of the suction conduit **15.** The valve **30** is controlled by a lever **32** integral with the detaching carrier **1.**

FIGS. 5 and 6 show another closure member arrangement in which the closure member is constituted by a flap **33** disposed inside the suction conduit **15** and adapted to shut off to a greater or lesser degree the suction caused by flow of air along the latter. For this purpose the flap **33** is integral with an axle **34** journaled in bearings **35** and carrying a crank **36** operated by the detaching carriage **1** by means of a bar **37.**

Of course the embodiments described above and shown in the drawing are only given by way of non-limiting example and it is obvious that one can modify the nature, disposition and the mounting of these elements.

Thus, the operation of the closure member may be effected according to any desired law corresponding in an optimum manner to the application envisaged. On the other hand the control of the closure member may be ensured by any members effecting a synchronous movement with that of the detaching carriage. In addition deflectors may be mounted in the mouth piece of the suction tube.

I claim:

1. A rectilinear comber adapted for treating long fiber materials, said comber comprising a circular comb, nipper means adjacent said comb, detaching means supported for reciprocal movement towards and away from said nipper means and comb, a suction funnel having a mouth arranged under the detaching means at a short

distance from the circular comb, conduit means coupled to said funnel for application of suction therein, and flow adjusting means in said conduit means operatively connected to said detaching means such that to each position of said detaching means moves, said flow adjusting means moves a corresponding distance to vary the flow of air through said funnel.

2. A rectilinear comber as claimed in claim **1,** wherein said conduit means is provided with an opening, said flow adjusting means comprising adjustable closure means adapted to adjust the area of the passage of air sucked from the atmosphere to said suction means via said opening such that the greater the area of the opening the smaller the flow of air through the funnel.

3. A rectilinear comber as claimed in claim **2,** wherein said closure means is closed when the detaching means occupies its furthest position away from the nipper means and said closure means progressively opens as the detaching means approaches the nipper means.

4. A rectilinear comber as claimed in claim **3,** wherein said closure means is located a sufficient distance from the funnel towards the suction means so as to be located in a zone where the atmospheric air passing through said closure means is not able to catch fibers coming from the comb.

5. A rectilinear comber as claimed in claim **1,** wherein said conduit means is provided with an opening located under the mouth of the funnel to produce a slight suction in the zone of the comb and nipping means.

6. A rectilinear comber as claimed in claim **1,** including means defining an alternative suction path to the said funnel leading into said conduit means, said closure means being arranged to control said alternative path, the entry to said alternative path being located away from the mouth of the funnel to avoid sucking fibers and fluff along the alternative path.

References Cited

UNITED STATES PATENTS

1,221,025	4/1917	Campbell	19—225
1,350,439	8/1920	Davidson	19—205 XR
2,558,706	6/1951	Hinson	19—232 XR
2,704,862	3/1955	Moss	19—202
3,373,462	3/1968	Herubel	19—230

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