

[54] **APPARATUS FOR GENERATING A SUCTION AIR STREAM IN A WEB COLLECTING ZONE OF A CARD**

[75] Inventors: **Hans Rutz**, Winterthur; **Heinrich Rutschmann**, Wiesendangen, both of Switzerland

[73] Assignee: **Rieter Machine Works Ltd.**, Winterthur, Switzerland

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[58] Field of Search..... 19/107, 109, 263

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Primary Examiner—Dorsey Newton
Attorney, Agent, or Firm—Werner W. Kleeman

[57] ABSTRACT

An apparatus for generating a suction air stream in a web collecting zone of a card comprising a liftable or detachable hood connected to a vacuum source and at least partially covering the web collecting zone in such a manner that the air stream at least partially passes through a web supplied by a web take-off roll arrangement. Means for influencing the air stream are provided beneath the hood directly above the web and in close vicinity to the roll arrangement.

10 Claims, 5 Drawing Figures

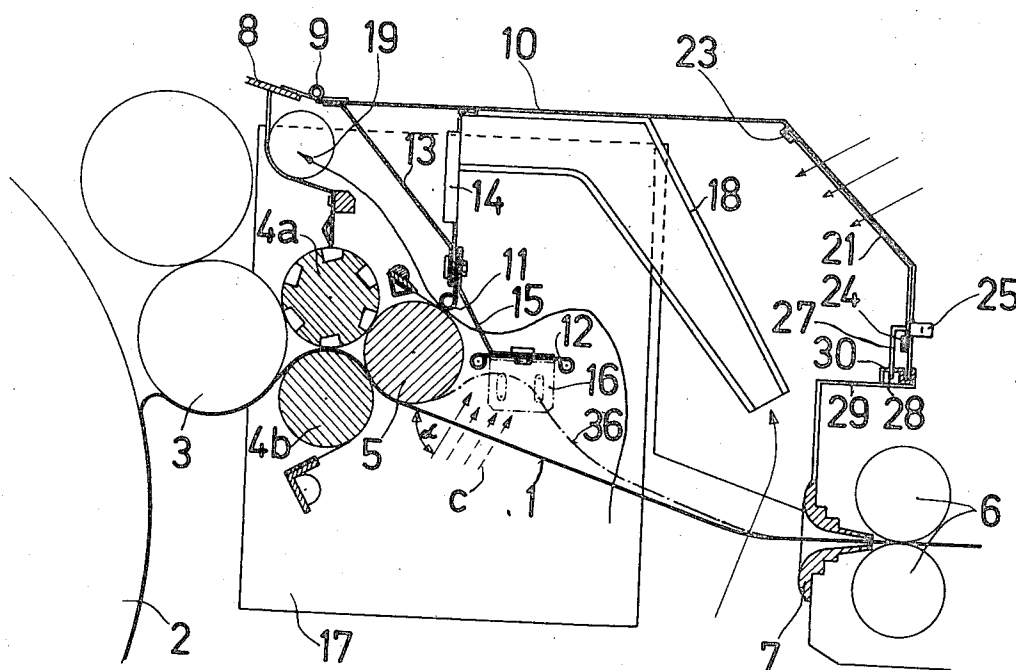


Fig. 1

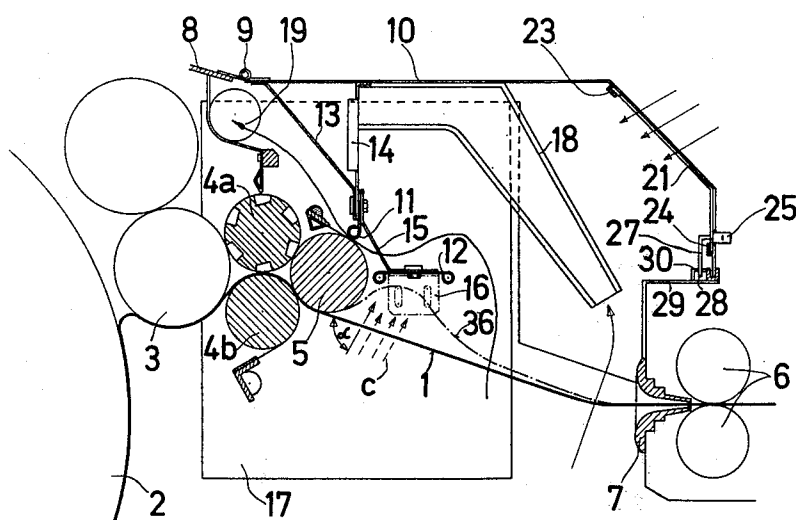


Fig. 2

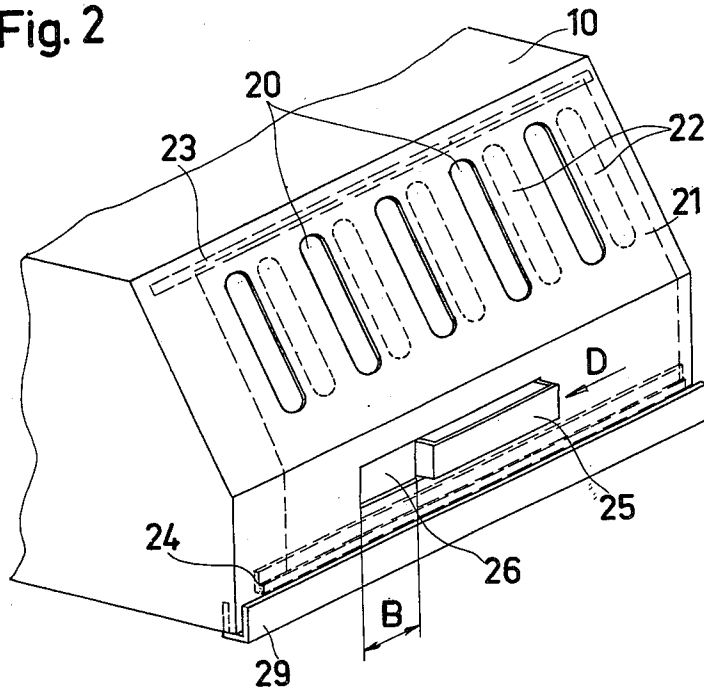
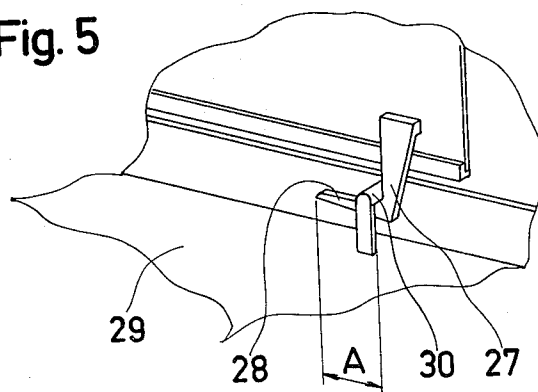
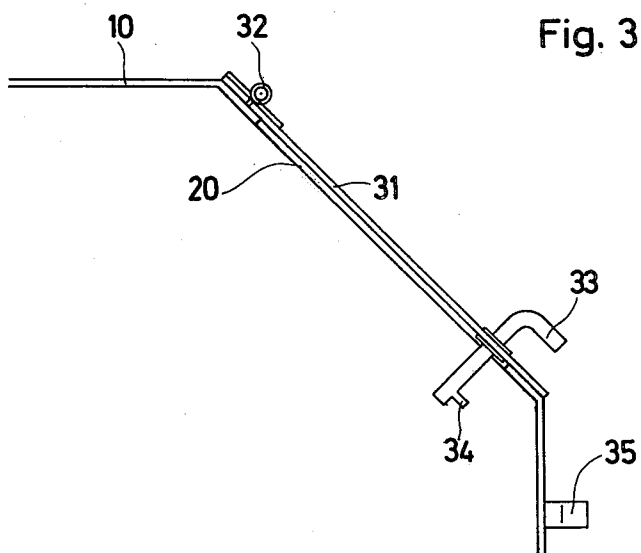
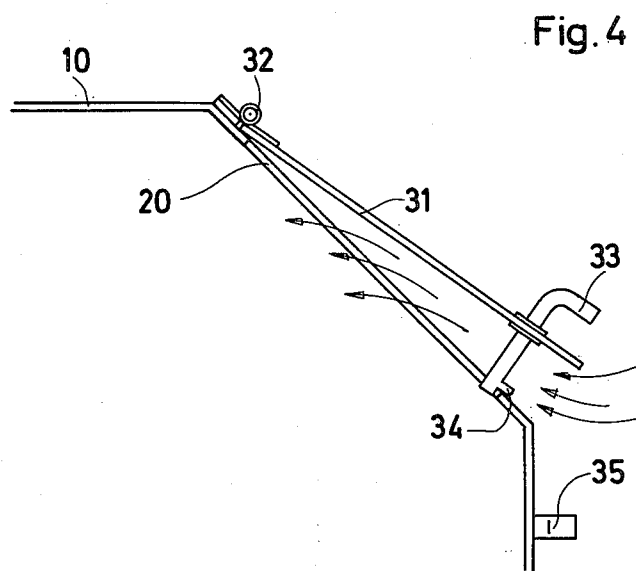


Fig. 5





APPARATUS FOR GENERATING A SUCTION AIR STREAM IN A WEB COLLECTING ZONE OF A CARD

BACKGROUND OF THE INVENTION

The present invention relates to a new and improved construction of apparatus for generating a suction air stream in a web collecting zone of a card, comprising a liftable or detachable hood connected to a vacuum source and which at least partially covers the web collecting zone in such a manner that the air stream at least partially passes through a web supplied by a web take-off roll arrangement. Devices of this type are used, for instance, on a card in staple fiber spinning.

The prior art is already familiar with constructions of such devices comprising a liftable or detachable hood covering the web collecting zone wherein an air stream is generated, by means of a vacuum prevailing beneath the hood, and such air stream at least partially passes through the web for the purpose of sucking-off loose contaminations or impurities. The aforementioned vacuum is maintained by a connection to an aspiration system.

This connection is arranged at the stationary cover of the web take-off device, i.e. in front of the hood and viewed in the direction of movement of the web, in such a manner that there is not required any pivotal arrangement of such connection. Thus, an air stream is generated which at least partially passes through the web substantially about the last roll of the web take-off roll arrangement and flows in the direction of the aspiration system connection.

However, the drawback of this prior art arrangement resides in the fact that the air stream, following the shortest path or the path presenting the least resistance, mainly extends in the region of the last roll of the last take-off roll arrangement and thus extends at a relatively steep angle relative to the web, so that with an aspiration-wise optimum air stream intensity there is present a severe danger of rupture of the web if additional air impulses or surges act upon the card from the outside. Also, the mechanical deflection of the web about the last roll, e.g. caused by contaminating particles sticking to the rolls, which entrain web portions of smaller or larger size, is intensified by an air stream, which as mentioned above, extends steeply in relation to the web.

A further drawback of such arrangement incorporating a hood resides in the fact that when the hood is opened or when the volume of air beneath the hood is increased, there is generated an additional air stream which passes through the web and which can be so intensive that if the hood is lifted too quickly the web can be ruptured.

SUMMARY OF THE INVENTION

Hence, it is a primary object of the present invention to provide an improved construction of apparatus for generating a suction air stream in a web collecting zone of a card which is not associated with the aforementioned drawbacks and limitations of the prior art proposals.

Another and more specific object of the present invention aims at eliminating the danger of web rupture during regular or normal operation as well as during quick opening of the hood arranged above the web, so

that considerable operational reliability of the equipment is achieved.

Now in order to implement these and still further objects of the invention, which will become more readily apparent as the description proceeds, the apparatus for generating a suction air stream in a web collecting zone of a card as contemplated by this development comprises a liftable hood connected to a vacuum source and at least partially covering the web collecting zone in such a manner that the air stream passes at least partially through a web supplied by the web take-off roll arrangement. Means for influencing the air stream are provided beneath the hood directly above the web and in close vicinity to the roll arrangement. In addition to the aforementioned means, there can be provided air entry openings near the hood for additionally influencing the air stream.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood and objects other than those set forth above, will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

FIG. 1 is a schematic cross-sectional view of the delivery end of a card equipped with a suction apparatus for generating a suction air stream at the web collecting zone of the card and designed according to the teachings of the invention;

FIG. 2 is a fragmentary perspective view of the hood member used in the arrangement of FIG. 1 and depicting the air entry openings thereof closed;

FIG. 3 is a partial cross-sectional view of an alternate embodiment of hood member, depicting its air entry closure member in its closed state;

FIG. 4 is a view, similar to the showing of FIG. 3, but this time depicting the air entry closure member in its opened state or position; and

FIG. 5 is a fragmentary view showing a detail of the inside of the hood member.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Describing now the drawings, and specifically directing attention initially to the arrangement depicted in FIG. 1, it is to be understood that on a card a web 1 is taken-off the doffer cylinder 2 by an intermediate roll 3 from which location it is further transported by a grooved roll 4a, a smooth roll 4b, and a web delivery roll 5. The web 1 is finally taken-off by a pair of calendar rolls 6 through the agency of a preceding web condensing trumpet 7. A hood or hood member 10 is pivotally arranged by means of hinges or pivots 9 on a card doffing roll cover 8. In the space or room beneath the hood 10 there are provided an air stream guide plate 11 and a guide plate 12 which does not contact the web delivery roll 5. The guide plates 11 and 12 are connected with the hood or hood member 10 by means of the holders or supports 13, 14, and 15. A flange 16 depicted in dash and dot or phantom lines portrays the possibility of rigidly connecting the guide plate 12 with at least one card frame member 17, in which case the holder or support 15 can be omitted. Furthermore, a suction nozzle 18 is connected with the hood 10, this nozzle 18 serving to suck-in air from the room or area upstream of the web condensing trumpet 7. The vacuum desired beneath the hood member or hood 10 is

generated by an aspirator or venting connection 19 which connects the room or space beneath the hood 10 with any suitable aspirator duct which has not been particularly shown in the drawing to preserve clarity in illustration.

Air entry openings 20 are provided at the hood 10, as best seen by referring to FIG. 2. At the region of these air entry openings 20 there is provided a sliding baffle 21 having openings 22, the baffle 21 being arranged within and directly at the hood 10. The size and mutual spacing of the openings 22 of the baffle 21 coincides with the size and mutual spacing of the openings 20 at the hood 10. In the exemplary embodiment under consideration the baffle 21 is guided by guide rails 23 and 24 in such a manner that in its one end position, as depicted in FIG. 2, this baffle seals the air entry openings 20 and in its other end position the air entry openings 20 and 22 coincide i.e. overlies one another in such a manner that air can penetrate into the inside room or space of the hood 10. Displacement or shifting of the baffle 21 can be carried out by means of a handle 25 connected with the baffle, this handle being slidably arranged in a slot 26 provided at the hood 10, as best seen by referring to FIG. 2. This handle 25 also may be conveniently employed for lifting or raising the hood 10. As best seen by referring to FIGS. 1 and 5, an arresting latch or lever 27 is provided on the baffle 21, the arresting latch penetrating by means of a foot or base portion 28 provided at the lever 27 beneath a pin 30 fixed at the card housing portion 29 (FIGS. 1, 2 and 5) when the baffle 21 is in its end position in which the air entry openings are sealed or blocked. In this way the hood 10 can be locked and prevented from being opened when the baffle 21 assumes such position. The distance A (FIG. 5) at least corresponds to the sliding distance B (FIG. 2) of the baffle and thus enables the hood 10 to be unlocked so that it can be lifted-off when the baffle 21 is in its other terminal or end position where the air entry openings 20 and 22 are superimposed.

Now, in FIG. 3 there is depicted a variant construction of air entry opening closure or seal wherein the air entry opening 20 is closed or sealed by a cover 31 hingedly connected by a hinge means 32 with the hood 10. A rotatable handle or handgrip 33 is associated with the cover or flap member 31. The handle 33 is equipped with a cam or projection 34 for supporting the cover 31, in its open position as depicted in FIG. 4, on the hood 10. The hood 10 can be lifted or raised by means of a handle 35. The air entry openings and their sealing or closure means are not restricted to the illustrated exemplary embodiments and all constructions suitable for this purpose can be employed.

During operation, the air stream generated by the vacuum prevailing internally of the hood 10, upon partial penetration through the web 1, is deflected by the guide plate 12 away from the web delivery roll 5 into the hollow room or space located thereabove. In this way there is prevented that there will be generated an air stream C which extends at a steep angle α with respect to the web 1 and which could arch or bow the web 1 as indicated with the dash and dot or phantom lines 36 and could cause rupture of the web. Furthermore, the guide plate 12 deflects any web portions clinging to the web delivery roll 5 in such a manner that they are reincorporated into the web 1.

In order to inspect the web 1 the hood 10 must be lifted. For this purpose the handle 25 is shifted in the

direction D (FIG. 2) thru the sliding distance B, with the result that the openings 22 of the sliding baffle 21 are shifted so as to slide beneath the openings 20 of the hood 10 and, on the other hand, the foot or base portion 28 of the locking latch or lever 27 is moved through the distance A so that the hood 10 can be now lifted or raised-off.

The advantages of the described apparatus can be basically enumerated as follows:

- a. there cannot be generated any air stream which is more or less at right angles with respect to the web around the web delivery roll, thereby considerably reducing the danger of web rupture during operation;
- b. the vacuum beneath the hood 10 is reduced before this hood is lifted or pivoted-up by the entry of air via the opening or openings 20 to such an extent that practically no air stream is generated in or through the web, wherefore lifting of the hood can be carried out quickly without danger of rupturing the web; and
- c. the hood cannot be raised or lifted-off during the time that the air entry openings are closed.

While there is shown and described present preferred embodiments of the invention, it is to be distinctly understood that the invention is not limited thereto, but may be otherwise variously embodied and practiced within the scope of the following claims. ACCORDINGLY,

What is claimed is:

1. An apparatus for generating a suction air stream in a web collecting zone of a card, comprising means for providing a web collecting zone including a web take-off roll arrangement for supplying a web, means for receiving and collecting the web, a liftable hood defining a room beneath said hood and cooperating with the web take-off roll arrangement, means for connecting the room beneath the liftable hood with a vacuum source, said liftable hood covering the entire web collecting zone in such a manner that the air stream substantially passes through the web supplied by the web take-off roll arrangement, and means for influencing the air stream essentially beneath the hood above the web, said influencing means including substantially horizontally arranged guide plate means disposed adjacent the web take-off roll arrangement and directly above the web between said web take-off roll arrangement and said means for receiving and collecting the web for preventing a substantially vertical passage of the air stream through the web in the collecting zone adjacent the roll arrangement.
2. The apparatus as defined in claim 1, further including means for fixing the guide plate means to the hood.
3. The apparatus as defined in claim 1, further including means for rigidly mounting the guide plate means to the card.
4. The apparatus as defined in claim 1, wherein said influencing means includes at least one air entry opening in said hood.
5. The apparatus as defined in claim 4, further including means for sealing said air entry opening.
6. The apparatus as defined in claim 5, wherein said sealing means comprises a cover.
7. The apparatus as defined in claim 6, further including means for hingedly mounting said cover at said hood.
8. An apparatus for generating a suction air stream in a web collecting zone of a card, comprising means

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for providing a web collecting zone including a web take-off roll arrangement for supplying a web, a liftable hood enclosing a space therein and cooperating with the web take-off roll arrangement, means for connecting the space within the liftable hood with a vacuum source, said liftable hood at least partially covering the web collecting zone in such a manner that an air stream at least partially passes through the web supplied by the web take-off roll arrangement, means for influencing the air stream beneath the hood above the web and adjacent the roll arrangement, said influencing means including at least one air entry opening provided at said hood, means comprising a sliding baffle for sealing said air entry opening, said baffle being provided with means for locking the hood in position during such time as the air entry opening is sealed.

9. The apparatus as defined in claim 8, wherein said locking means comprises a lever mounted at the baffle, a pin mounted in fixed position relative to the baffle, said lever having a foot which extends beneath the pin

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when the air entry opening is sealed in order to thus prevent lifting-off of the hood.

10. An apparatus for generating a suction air stream in a web collecting zone of a card, comprising means for providing a web collecting zone including a web take-off roll arrangement for supplying a web, a liftable hood enclosing a space therein and cooperating with the web take-off roll arrangement, means for connecting the space within the liftable hood with a vacuum source, said liftable hood at least partially covering the web collecting zone in such a manner that an air stream at least partially passes through the web supplied by the web take-off roll arrangement, means for influencing the air stream beneath the hood above the web and adjacent the roll arrangement, said influencing means including at least one air entry opening provided at said hood, means comprising a sliding baffle for sealing said air entry opening, said baffle being provided with at least one air entry opening.

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