

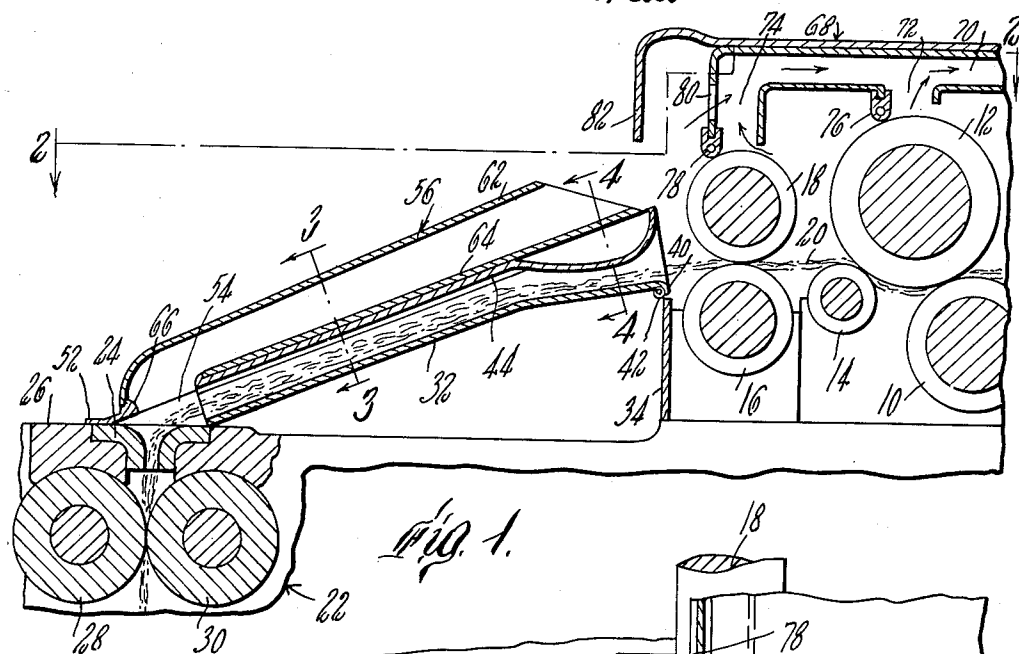
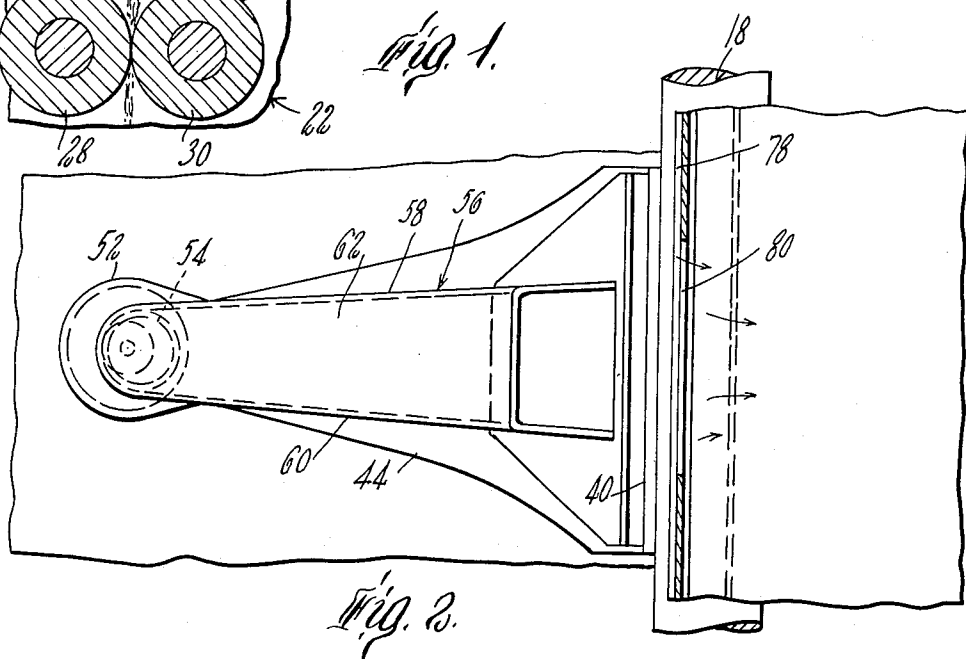
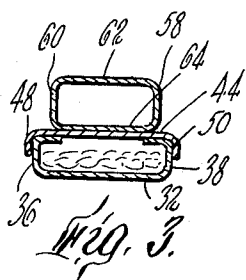
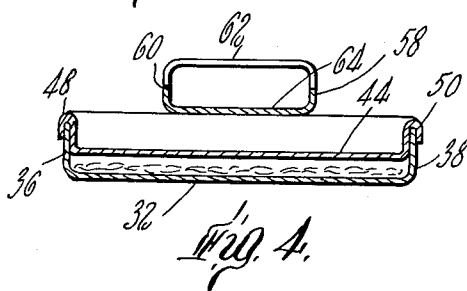
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P. B. WEST

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FLY REMOVING APPARATUS

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FLY REMOVING APPARATUS

Paul B. West, Clemson, S.C., assignor to Saco-Lowell Shops, Boston, Mass., a corporation of Maine
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This invention relates to drawing frame calendering mechanisms and more particularly to a novel and improved means for removing fly and lint from the vicinity of the calender trumpet.

The sliver delivered by a drawing frame is moved a distance of several inches from the nip of the last pair of rolls thereof to a calendering mechanism which forms the input to a coiler or other take-up mechanism of the frame. During this movement, however, the untwisted sliver tends to be opened up with the individual fibers being spread outwardly and released from the body of the sliver in the form of lint or fly, principally because of the action of the conventional trumpet associated with the calendering mechanism in squeezing air out of the fibers but also because of the generation of static electricity and the effect of the sliver's movement through the air. In modern high speed drawing frames the speed of the sliver is often great enough to cause the release of a substantial quantity of individual fibers resulting in a considerable loss of fiber. An enclosure for the sliver in this area which greatly reduces this fiber loss and provides improved control of the sliver during transfer between the drafting element and the calendering mechanism is disclosed in my U.S. Pat. No. 2,858,577. In that structure there is provided a generally triangular enclosure configuration whereby the air, squeezed from the fiber by reason of the sliver entry into the trumpet, is returned in a countercurrent direction over the sliver within the enclosure. The return passageway is in the form of an upwardly extending bulge in the narrow throat portion of the enclosure so that the air velocity in that vicinity may be maintained at a comparatively low value. Even with this greatly improved sliver control device, it has been found that under certain conditions there is an excessive amount of fly produced which is not completely extracted by the countercurrent flow within the horn enclosure and which accumulates at the trumpet of the calendering mechanism. Unless this fly is removed, it will gradually build up, interfere with the proper calendering operation and eventually cause breakage of the sliver.

Accordingly, it is a principal object of this invention to provide an improved sliver enclosure and guide which enables the continual removal of lint and fly from the vicinity of the calendering mechanism.

Another object of the invention is to provide in a drawing frame a novel sliver enclosure device which utilizes a flow of air created by the movement of sliver through the enclosure to eject fly from the vicinity of the calendering mechanism and which operates without impairing the flow of sliver through the enclosure.

Still another object of the invention is to provide means associated with the calendering mechanism for removing fly from the vicinity of that mechanism in a separate channel and without interference to the smooth forward movement of sliver from the drafting element to the calender trumpet.

In accordance with the invention there is provided a generally triangularly shaped sliver enclosure having a constricted mouth opening and a body portion of a substantially constant depth extending from the area of the constricted opening to the trumpet associated with the calendering mechanism. The sliver moves smoothly through this enclosure toward the trumpet.

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An aperture is provided in the enclosure adjacent the calender trumpet and air drawn along with the sliver is ejected through the aperture. The movement of air carries fly and other materials that are expressed from the sliver as it is compressed by the enclosure and trumpet through the aperture and away from the vicinity of the trumpet without any adverse effect on the formation or flow of the sliver and thus enables the calender trumpet area to be maintained clear of excess fly and similar undesirable materials. In the preferred embodiment a conduit is provided to conduct the ejected fly away from the aperture in the throat portion of the enclosure adjacent the trumpet. This conduit comprises a cover structure which is mounted on top of the sliver enclosure and extends from the aperture in the upper enclosure in a direction generally parallel to the movement of sliver to the vicinity of the last pair of drafting rolls. The air pump action of the sliver moving through the enclosure in and of itself provides sufficient air movement to expel the lint and fly from the end of the conduit adjacent the drafting rolls. A drafting roll clearer mechanism of the pneumatic type is utilized in the preferred embodiment and it acts to collect the sliver fly, ejected through the aperture in the enclosure and through the conduit by the air pump action of the sliver movement, for disposal in conventional manner. Thus the structure provides a combination of an enclosure apparatus which achieves a desirable control of sliver movement and an improved fly ejection means for removing undesirable material from the vicinity of the calendering operation without the removal of an undue amount of material as might result from the application of a reduced pressure environment immediately adjacent the trumpet.

Other objects and advantages of the invention will be seen as the following description of the preferred embodiment thereof progresses in conjunction with the drawing, in which:

FIG. 1 is an elevational view of a portion of a drawing frame showing the sliver controlling enclosure and fly removing structure according to the preferred embodiment of the invention;

FIG. 2 is a plan view of the sliver controlling enclosure and fly removing structure of FIG. 1;

FIG. 3 is a sectional view of the enclosure and extracting conduit taken along the line 3—3 of FIG. 1; and

FIG. 4 is a sectional view of the enclosure and extracting conduit taken along the line 4—4 of FIG. 1.

As shown in FIG. 1 the drawing frame includes a plurality of cooperating rolls 10, 12, 14, 16 and 18. A sliver web 20 is passed between those rolls and through the nip of the last pair and then transported a distance of several inches to the calendering mechanism 22 which is shown as including a trumpet 24 mounted on a support structure 26 and a pair of calendering rolls 28, 30 through which the sliver is passed to an appropriate device, such as a coiler.

The sliver 20 is passed through an enclosure during the transition between the nip of the last pair of drafting rolls 16, 18 and the trumpet 24. That enclosure comprises generally a flat base member 32, one end of which is pivotally secured to the forward end of the roll stand 34 with the other end normally resting on the trumpet adjacent the support flange 26. The base member has upwardly and inwardly turned flaring sides 36, 38 as shown in FIGS. 3 and 4. The mouth portion has a transversely extending entrance that is slightly turned down in a smooth curve to facilitate entry of the sliver and its edge 40 is secured to the roll stand 34 by means of a transversely extending pivot shaft 42. Due to the static electricity generating characteristics of the moving

sliver of cotton, wool or synthetic fiber, it is important that at least the bottom portion of the enclosure will have an interior surface of nonstatic electricity generating material and the use of the conductive material such as sheet metal having a good electrical connection through the frame serves this purpose well, although plastic materials may also be used with appropriate surface treatment. Removably positioned above the base portion of the enclosure is an upper or enclosure cover portion 44 which completes the enclosure in the shape of a generally triangular horn with slightly flaring sides having a mouth opening adjacent the nip of the drawing frame output rolls and a throat opening adjacent the trumpet and in sealing contact with the face of the trumpet as shown in FIGS. 1 and 2. Its mouth end portion is flared upwardly slightly to facilitate entry of the sliver and then is depressed so as to form with the bottom portion a constricted passageway for the sliver. This constriction substantially eliminates any tendency for the flow of air counter to the direction of sliver movement. The principal surface of the cover is generally flat with outside depending flanges 48, 50 which extend over and cooperate with the upwardly extending sides of the base to provide adequate sealing of the enclosure. Preferably a flange 52 is provided on the cover at the lower or throat end which cooperates with the trumpet. The cover member has an aperture 54 in it which is disposed directly above the trumpet.

A conduit structure 56 is positioned above the cover. This structure may be formed integrally with the cover member or may be formed separately as shown and attached to the cover member with a suitable adhesive. In the illustrated embodiment the conduit has two slightly tapering wall portions 58, 60 and a top and bottom portion, 62, 64 respectively, which provide a tapered channel that extends the length of the enclosure from the aperture 54 to the vicinity of the top roll 18. The cover is positioned on the enclosure cover with its entrance openings fitted securely around the upstanding lip portion 66 of the aperture 54.

A conventional pneumatic clearer generally indicated at 68 is utilized for removing lint from the top rolls 12, 18. This clearer includes a main suction channel 70 which has depending channel portions 72, 74 disposed directly above the rolls 12, 18 respectively. As shown in FIG. 1, each forward wall of the depending channels includes a resilient wiping member 76, 78 which rests on the rolls 12, 18 respectively. The channel portions provide passageways for movement of air and entrained materials in a clearing action along paths generally indicated by the arrows. The forward edge of the passageway 74 has an aperture 80 therein which enables a flow of air to be created under the influence of the reduced atmosphere, as indicated generally by the arrow. An extension 82 of the clearer enclosure is utilized to create a reduction of pressure adjacent the upper end of conduit 56. This reduced pressure is sufficient to cause a movement of air adjacent the upper end of the conduit that is effective to remove fly and lint that is ejected into the conduit through the aperture 54 from the vicinity of the trumpet 24 and thus prevent an excessive accumulation of undesired material at any point.

It is preferred that both the cover 44 and the conduit 56 be of a clear plastic such as vinyl, acrylic or styrene plastic which can be readily formed as required. In this manner both the sliver movement and the fly removal process can be easily observed.

In operation the sliver 20 is passed from the nip of the rolls 16, 18 through the enclosure and is gradually gathered together for passage through the trumpet aperture. In this gathering operation air and a certain amount of fiber are expressed from the sliver. The general sliver movement through the enclosure, however, is protected from air turbulence due to the flared horn

configuration of the enclosure so that there is smooth flow of sliver without any undue interference. The air expressed from the sliver by the condensing action of the enclosure and trumpet 24 is continuously ejected from the enclosure through the aperture 54 and moves through the conduit 56 under the influence of the air pump action of the sliver movement. Fly and lint are also carried rapidly away from the sliver 20 in the area of the trumpet by this air flow in an effective clearing action. The constriction adjacent the trumpet mouth insures that any air expressed from the sliver will move through the enclosure in the same direction as the sliver and be ejected through the aperture 56. Thus the structure according to the invention provides a cleaner drawing operation and results in production of a superior yarn and cloth.

While there has been shown and described herein a preferred embodiment of the invention it will be understood that the invention is not intended to be limited thereto or to details thereof and departures may be made therefrom within the spirit and scope of the invention as defined in the claims.

I claim:

1. In combination with a drawing frame having a pair of drafting element output rolls followed by a pair of calender rolls having an input trumpet for feeding drafted sliver to a take-up package, a sliver controlling enclosure for the web of sliver extending from adjacent the nip of said output rolls to adjacent said trumpet, said enclosure being in the shape of a generally triangular flat bottomed horn with flaring sides and having a narrow generally rectangular mouth opening of greater width than height positioned closely adjacent the nip of said output rolls and a throat opening of generally circular configuration positioned closely adjacent and above said trumpet and in contact with the face of said trumpet, said enclosure having a generally flat bottom portion extending continuously from adjacent said output nip to said trumpet and having an interior surface of nonstatic electricity generating material, and an upper portion joined with said bottom portion to provide enclosed sides along the length of said enclosure with said upper portion being disposed in substantially parallel spaced relationship from said bottom portion along a substantial length thereof, an aperture in said upper portion disposed generally directly above said trumpet, and a conduit disposed outside of said enclosure and in communication with said aperture, said conduit being adapted to convey lint and fly ejected from said enclosure through said aperture under the influence of air flow created by the sliver condensing action of said enclosure and said trumpet without interfering with the smooth flow of sliver through said enclosure and said trumpet.

2. The combination as claimed in claim 1 wherein said conduit comprises an elongated plastic member formed to have substantially flat top and bottom portions and two connecting side portions disposed generally perpendicular thereto, said conduit member being adapted to be attached to said upper portion of said enclosure to provide an enclosed channel that extends substantially the entire length of said enclosure generally parallel to the direction of sliver movement through said enclosure.

3. In combination with a drawing frame having a pair of drafting element output rolls followed by a pair of calender rolls having an input trumpet for feeding drafted sliver to a take-up package, and including a pneumatic clearer associated with the top rolls of the drafting element, a sliver controlling enclosure for the web of sliver extending from adjacent the nip of said output rolls to a point adjacent said trumpet, said enclosure being in the shape of a generally triangular flat bottomed horn with flaring sides and having a narrow generally rectangular mouth opening of greater width than height providing a constricted passageway sufficient to receive a web of sliver positioned adjacent the nip of said output rolls and a throat opening of generally circular configuration posi-

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tioned closely adjacent and above said trumpet and in contact with the face of said trumpet, said enclosure having a generally flat bottom portion extending continuously from adjacent said output nip to said trumpet and having an interior surface of nonstatic electricity generating material, and an upper portion joined with said bottom portion to provide enclosed sides along the length of said enclosure with said upper portion being disposed in substantially parallel spaced relationship from said bottom portion along a substantial length thereof, 10 an aperture in said upper portion disposed generally directly above said trumpet, and a conduit disposed in communication with said aperture and secured to said upper portion, said conduit extending substantially the

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entire length of said enclosure with the end opposite said aperture disposed adjacent said pneumatic clearer so that said clearer acts to collect lint and fly expelled through said aperture and said conduit by the air pump action created by the condensing of the sliver by said enclosure and said trumpet.

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