Sept. 27, 1960 B. W. LYNCH, JR 2,953,823

APPARATUS FOR PROCESSING TEXTILE FIBERS

Filed Dec. 18, 1957 2 Sheets-Sheet 1

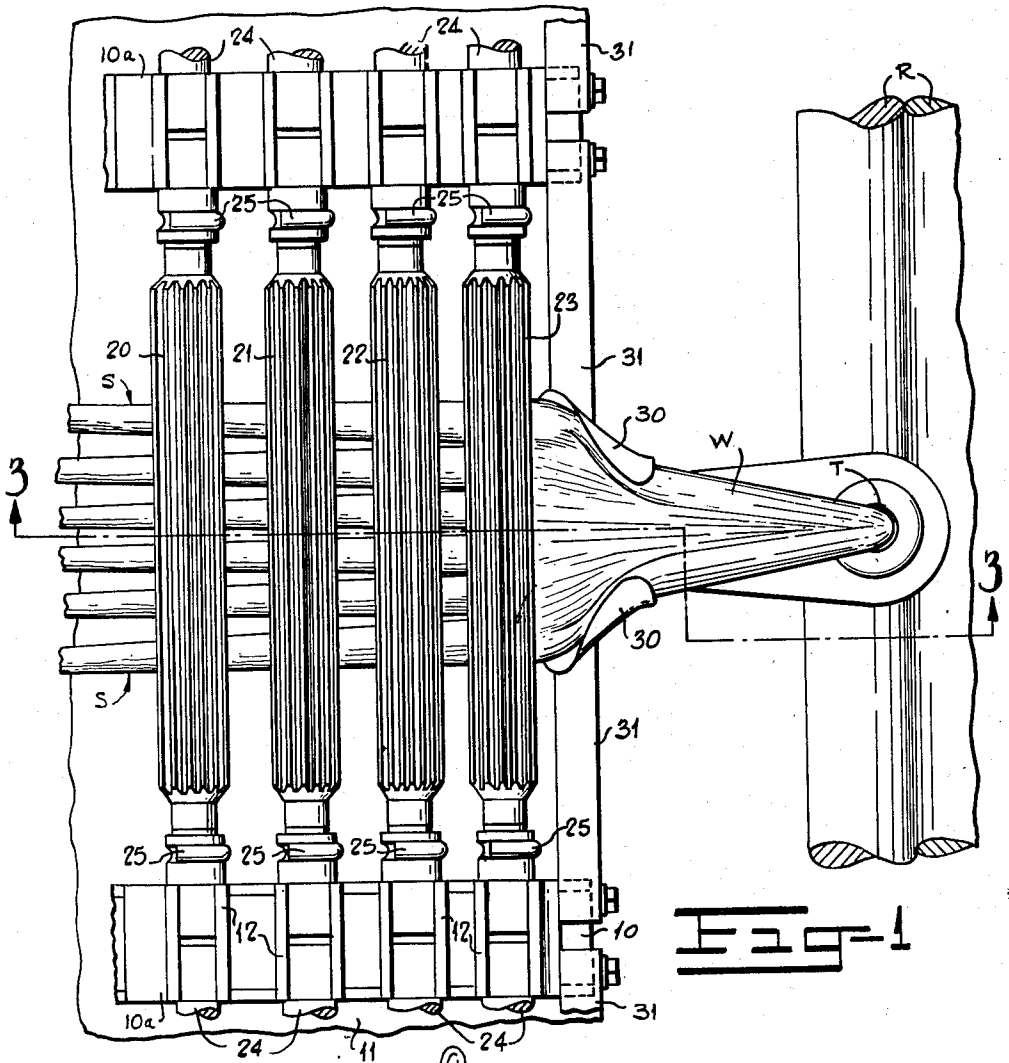


Fig-1

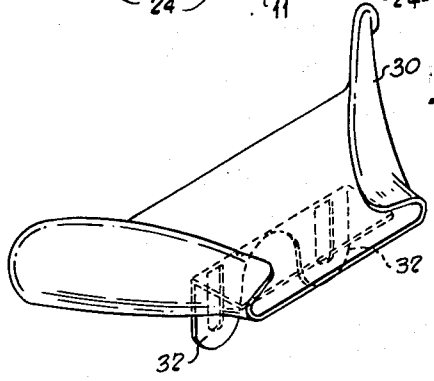


Fig-2

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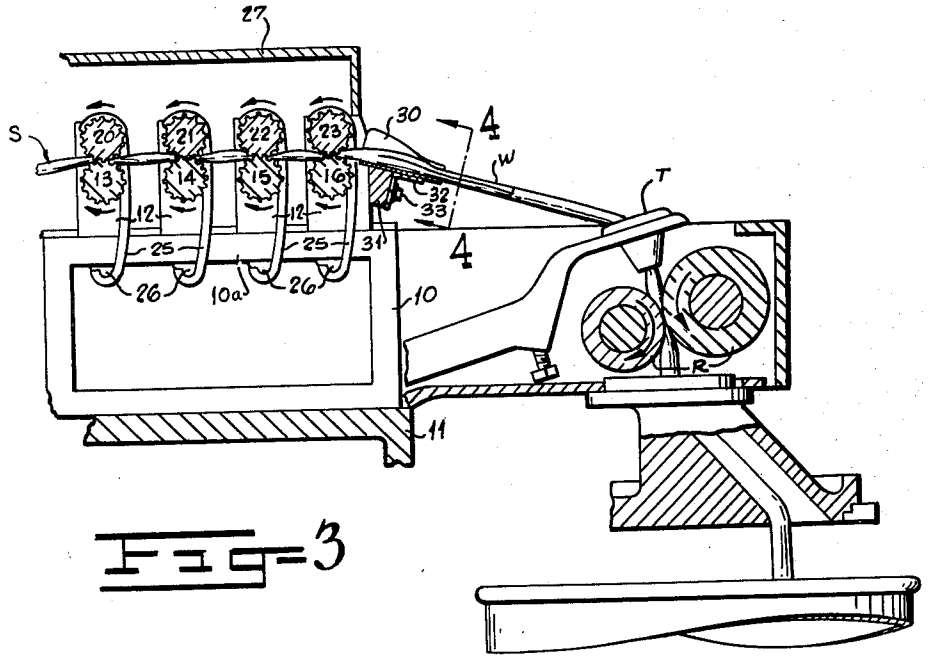


Fig-3

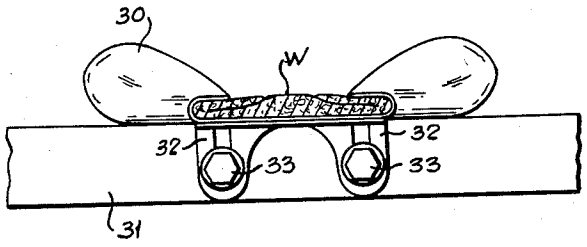


Fig- 4

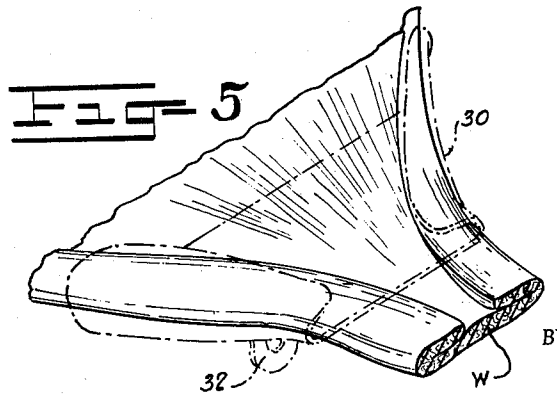


Fig- 5

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2,953,823

APPARATUS FOR PROCESSING TEXTILE FIBERS

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1 Claim. (Cl. 19—157)

This invention relates to apparatus for drawing or drafting textile strands of sliver or sliver laps, of the type which is provided in association with drawing frames, combers and the like, and it is the primary object of this invention to provide means for reducing undesirable fly produced in drafting operations.

As is well known to those familiar with the art, drawing mechanisms comprise a series of pairs of rolls, positioned one pair in advance of another, through which textile strands of sliver or sliver laps are fed, each successive pair of rolls being driven at slightly higher peripheral speed than the preceding pair so as to produce the desired draft. The attenuated strands are issued from the delivery rolls in the form of a web which passes therefrom into a trumpet spaced from the delivery rolls, said trumpet having a restricted aperture which causes the web to condense before passage between calender rolls or the like which form new sliver.

Now, the drafting of these strands of sliver or sliver laps results in the formation of a web of attenuated fibers which contains very thin outer edges or selvages. These very thin selvages are highly undesirable because the short fibers therein separate from the selvages due to the fact that there is not enough substance to the web at the selvage points to hold them in. These separated short fibers disperse into the surrounding air and cause what is commonly called fly. This fly tends to collect around the head of the trumpet and build up into a conglomerate mass of short fibers. These conglomerate masses of fibers are intermittently carried through the trumpet by the web and trapped in the resulting sliver formed from the web by the calender rolls or the like. Such engulfed masses of fibers tend to cause lumps in the resulting sliver which substantially degrades the quality of yarn ultimately produced from the sliver by causing gouts in such yarn.

It is therefore another object of this invention to provide a means of passing the web into and through a funnel-like device positioned between the delivery rolls and the trumpet, immediately in front of the delivery rolls and spaced from the trumpet, said device rollingly folding the selvages of the web upon the web itself and thereby entrapping a substantial portion of fly-producing fibers and creating new and substantially thicker selvages from which the short, fly-producing fibers cannot easily escape. This elimination of a substantial amount of fly results in a sliver which is substantially free of lumps caused by conglomerate masses of fibers being intermittently carried through the trumpet and engulfed in the sliver, and ultimately results in a yarn of substantially higher quality.

It is still another object of this invention to provide a means for reducing the width of the web upon its emission from the delivery rolls and thereby facilitate passage of said web into and through the trumpet.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings in which:

Figure 1 is a top plan view of a drawing mechanism showing my invention associated therewith;

Figure 2 is an isometric view of the web folding device showing means to attach said device to the frame of a drawing mechanism on a slightly larger scale than used in Figure 1;

Figure 3 is a vertical sectional view mostly in elevation and taken along line 3—3 in Figure 1, and also showing a coiler mechanism similar to those used in conjunction with drawing frames, this being on a reduced scale;

Figure 4 is a front elevation view of the folding device looking along line 4—4 in Figure 3, showing a sectional view of the folded web as it is emitted from the restricted end of said folding device, and being on approximately the same scale as used in Figure 2;

Figure 5 is an isometric view of the web as it is folded and condensed by the folding device which is shown in phantom lines, and being on approximately the same scale as used in Figure 4.

In the drawings the folding device is shown in association with a textile drawing frame although it is to be understood that the device and other devices performing a similar function may be used in association with any type of textile machine having rolls for attenuating or drafting fibrous strands and a trumpet for receiving and condensing the web emitted from the delivery rolls, such as a comber or the like.

Referring first to Figures 1 and 3, the numeral **10** indicates spaced bearing stands which are suitably secured to a common frame member **11** and a plurality of substantially U-shaped bearing blocks **12** are mounted on the upper surface of each of the bearing stands **10**.

Fluted bottom drawing rolls **13**, **14**, **15**, and **16** are journaled in the bearing blocks **12**. Bottom rolls **13**, **14** and **15** are intermediate drawing or drafting rolls, and the bottom roll **16** is a delivery drawing roll. The intermediate and delivery drawing rolls **13**, **14**, **15** and **16** have respective intermediate and delivery top rolls **20**, **21**, **22** and **23** resting thereupon and being journaled at opposite ends thereof in suitable corresponding bearing sleeves **24** mounted for vertical movement in the corresponding bearing blocks **12**. The top rolls **20**, **21**, **22** and **23** may also be fluted for as much of their length as the fluted portions of the respective bottom rolls **13**, **14**, **15**, and **16**, as shown in Figures 1 and 3, or they may be covered with suitable resilient material such as rubber, leather and the like as is well known to those familiar with the art.

The bottom rolls **13**, **14**, **15** and **16** are positively driven by suitable gearing, not shown, but the top rolls are driven generally through their relationship to the bottom rolls and through the intervening strands generally designated S. The intermediate and front or delivery top rolls **20**, **21**, **22** and **23** are resiliently urged downwardly against the respective bottom rolls **13**, **14**, **15** and **16** by corresponding springs or weight hooks **25** which bear on the bearing sleeves **24** and extend downwardly beneath the bottom rolls **13**, **14**, **15** and **16** and are connected to suitable means which, in this instance, are shown in the form of leaf spring members **26** suitably secured to the lower surfaces of the horizontal portions **10***a* of the bearing stands **10**.

Each successive pair of rolls **13**, **20**, **14**, **21**, **15**, **22** and **16**, **23**, proceeding from left to right in Figure 3, are driven at progressively higher speeds to produce the desired draft in the strands or lap of sliver. A conventional cover **27** surmounts the drafting rolls with its front edge resting upon the front or foremost bearing block **12** and is pivoted at its rear end by means not shown.

Strands S, or a lap of strands, are directed to the drawing rolls from delivery rolls, not shown, and are drafted to form an attenuated web of fibers W. The web W has

heretofore passed between delivery rolls **16, 23** and has traveled in this form directly to trumpet T where said web W was condensed by its passage through the restricted aperture of trumpet T before passing between calender rolls R.

The parts heretofore described are conventional parts of a drawing or drafting frame, mechanism or the like, and it is with such an organization of parts that the present invention is adapted to be associated.

Heretofore, the web W has traveled directly to trumpet T from delivery rolls **16, 23** and has been condensed by virtue of its passage into the restricted aperture in trumpet T. This attenuated web W has a tendency to have very thin selvages from which short fibers easily escape and cause fly. This fly has a tendency to collect around the trumpet T and build up into conglomerate masses of short fibers which are sometimes carried through the trumpet T intermittently, thus causing lumps in the resulting sliver and gouts in the ultimately produced yarn.

Now, in order to correct this condition, I have provided a device **30**, shown in Figures 1, 2, 3, 4 and 5, for folding the selvages of web W over upon the web itself, thereby forming new and substantially thicker selvages, and in addition, forming a more narrow web to facilitate passage into the trumpet T. Device **30** is attachable to a horizontal cross member **31** by means of slotted flanges **32** and bolts **33** or the like, said flanges being slotted to facilitate proper adjustment of device **30**. Horizontal cross member **31** extends between bearing blocks **12** and can be connected by any suitable means to such bearing blocks.

Device **30** is made of copper or other substantially malleable metal, alloy or the like. The side edges of device **30** are bent upwardly, inwardly and progressively downwardly at converging angles so as to give a substantially funnel-like appearance, best illustrated in Figure 2. Device **30** is attached to horizontal cross member **31** so that the wide back portion of said device faces delivery rolls **16, 23**, and the restricted front portion faces trumpet T spaced therefrom.

As web W is emitted from delivery rolls **16, 23** it immediately passes into device **30** and the selvages of web W roll upwardly and progressively inwardly according to the conformation of the side walls of device **30**.

This rolling of the selvages of web W results in the selvages being folded upon web W and the fly-producing fibers which made up the selvages being trapped in web W and new and substantially thicker selvages formed. Web W, in its new, substantially thicker and more narrow form, then passes from the restricted front opening of device **30** downwardly into trumpet T.

The angle of convergence of the side walls of device **30** can vary from 20 to 40 degrees, depending on how much of the thin selvages of web W necessitate being folded. It is apparent that the angle of convergence is largely determined by the width of the front and back ends of the device **30** and the length thereof. However, it is found that an angle of 30 degrees can be used successfully for most drafting operations.

For optimum results the wide back portion of device **30** should be substantially the same width as the web W which is emitted from delivery rolls **16, 23**. This width

will vary according to the drafting operation in use on a particular drafting mechanism.

It can thus be seen that I have provided a unique apparatus for substantially reducing fly produced in drafting operations by providing a device immediately in front of the drafting rolls which folds the outer edges or selvages of the web emitted from the delivery rolls, thereby entrapping the thin fly-producing fibers of the selvages in the web, and forming substantially thicker selvages upon the web with substantially less fly-producing characteristics, and thereby also reducing the width of the web to facilitate its passage through the trumpet.

In sliver drafting processes heretofore, the outer edges or selvages of the web emitted from the delivery rolls have been thin. These thin selvages have been a major factor in the production of undesirable fly because short fibers within these selvages were easily escapable. This escaped fly tends to collect around the trumpet head and ultimately cause lumpy sliver. My invention has substantially reduced this undesirable fly and therefore improved the quality of yarn ultimately produced in the processing of textile fibers.

In the drawings and specification there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claim.

I claim:

For use with a drafting mechanism having a series of sets of top and bottom drafting rolls and including a pair of delivery rolls for attenuating textile strands and forming a web therefrom, and a trumpet spaced forwardly from said delivery rolls for receiving said web from said delivery rolls; a device for supporting and guiding said web in its forward movement from the delivery rolls to the trumpet comprising a flat base having opposed rear and front edges, means supporting said device so said rear edge is positioned in such close relation to the delivery rolls as to support said web at the delivery rolls, said base having forwardly converging and upwardly turned side walls thereon, said walls being of greater height at their rear ends than at their front ends, and said side walls being turned inwardly at their upper portions to overly said base in such a manner that their upper portions project inwardly from the side walls progressively increasing amounts from the rear to the front edges of the base to thereby gradually condense and overfold the edges of the web formed of the strands as the web moves from the delivery rolls to the trumpet.

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