June 4, 1940. C. WALSH ET AL 2,203,423

LONG DRAFT APPARATUS

Filed Aug. 5, 1938

Fig. 1.

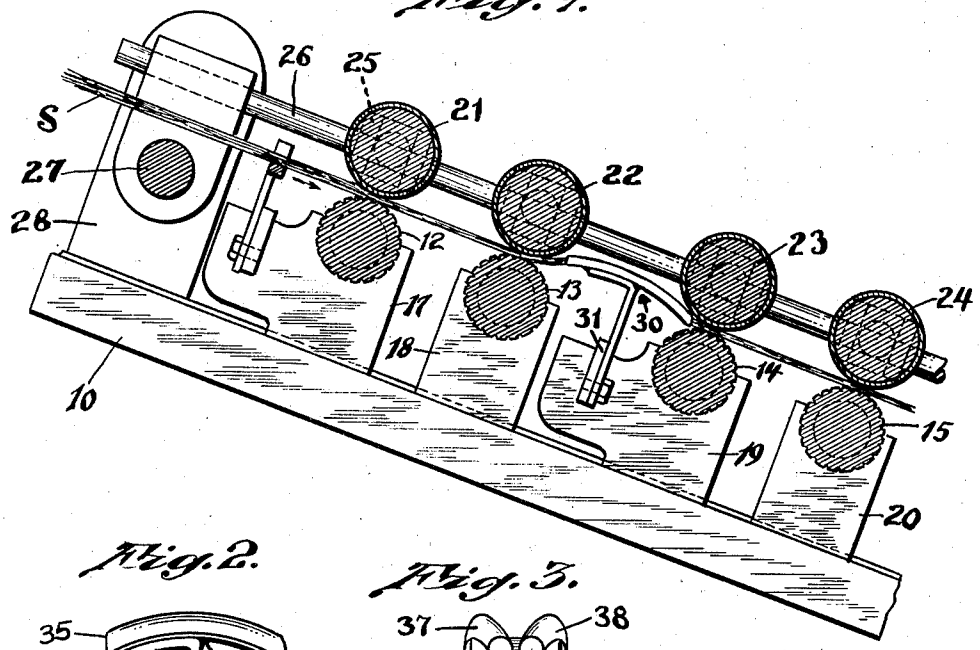


Fig. 2.

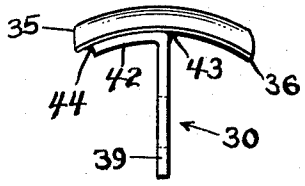


Fig. 3.

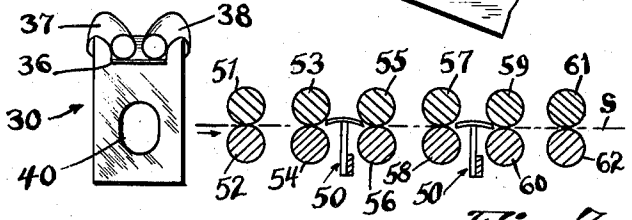


Fig. 7

Fig. 5.

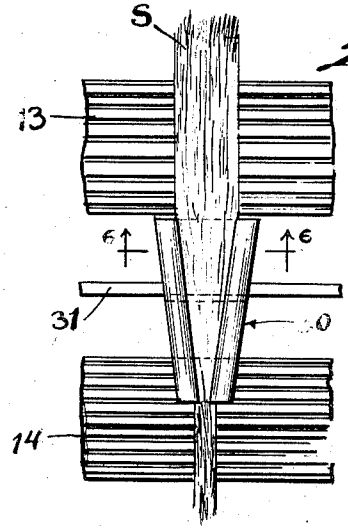


Fig. 4.

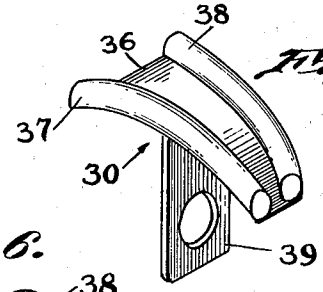
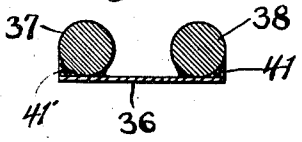


Fig. 6.



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LONG DRAFT APPARATUS

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Application August 5, 1938, Serial No. 223,242

4 Claims. (Cl. 19—157)

This invention relates to drafting mechanisms for textile slivers or rovings; and has for one of its objects to provide a novel device to be used in such mechanisms for guiding and controlling the fibers of the moving sliver or roving.

Another object of the invention is the provision of means in the path of travel of a moving strand of sliver or roving adapted to deflect inwardly over the body of the sliver, the fibers which are disposed closely adjacent to and at the marginal edges of the sliver.

Another object of the invention is to provide a device capable of elevating and forcing both selvages of the sliver to the middle of the strand during its passage through the device.

Another object is to provide a combined folder and condenser which is so shaped as to act on a flat ribbon of sliver to form the same into cylindrical form and capable of delivering the reformed sliver very close to the line of contact of the next succeeding pair of draft rolls for the subsequent drafting.

Another object of the invention is to provide a device of the above character that is so constructed and arranged that the delivery portion thereof where the reformed and condensed sliver emerges from the device, may be inserted into the bite of the next adjacent pairs of draft rollers very close to the line of engagement of the same.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawing:

Fig. 1 is a side elevational view, in section on a reduced scale, of a portion or a roving frame showing the application of one of the combined folder and condenser devices embodying my invention placed in working position with respect to the drawing mechanism;

Fig. 2 is a side view of one form of combined folder and condenser device constructed in accordance with my invention;

Fig. 3 is an end view of the combined folder and condenser device shown in Fig. 2 looking at the discharge or delivery end thereof;

Fig. 4 is a perspective view of the combined folder and condenser device represented in Figs. 2 and 3;

Fig. 5 is a top plan view of one of the combined folder and condenser devices shown in Figs. 2, 3 and 4 placed in operating position in relation to a pair of lower draft rolls in the arrangement shown in Fig. 1 and with the upper draft rollers removed;

Fig. 6 is an enlarged sectional view taken on the line 6—6 of Fig. 5; and

Fig. 7 is a diagrammatic representation, in side elevation, showing two folder condenser devices located in different and separate stages of the draft mechanism, and illustrating the successive steps of drafting, doubling over and condensing, re-drafting, again folding and condensing, and re-drafting the sliver.

In the long drafting of textile slivers or rovings it is desirable to employ some sort of device to guide and support the thin flat moving ribbon of drafted sliver or roving as it leaves the rolls of one draft stage in passing to the next set of draft rolls for a subsequent drafting, and to keep together the fibers at both selvages of the sliver and to prevent sagging, fraying or fuzzing of the same in being transported between two sets of draft rollers; and in order to accomplish the above desired advantages, we have provided a novel guide device for guiding and condensing the fibers of the strand of sliver or roving as it leaves one set of draft rollers and prior to its being acted upon by a succeeding set of draft rollers; and we attain this end by constructing the condenser-guide device so that it will turn upwardly and fold over the body of the main body of the sliver both selvages thereof by forcing the fibers therein towards the middle of the strand, and for this purpose, the device comprises a body member extending lengthwise in the path of travel of the moving strand of sliver or roving provided with a bottom guide portion of upwardly curved or arched formation in the direction of travel of the sliver in the normal operating position of the device upon the machine between two successive sets of draft rollers, while projecting upwardly from the top surface of this arched guide portion at the edges thereof are the side walls of the device which converge forwardly from the rear to the front ends of the device for condensing the sliver, and the oppositely disposed inside side faces of these upstanding side walls are convexly curved for forcing upwardly and folding over the main body portion of the moving sliver or roving the fibers disposed at the marginal portions of the selvage edges thereof to form the sliver into cylindrical form, the curvature of the opposed inner faces of said side walls extending in a continuous curve upwardly from their meeting line with the floor portion a distance of at least the average thickness of a sliver when the same is acted upon by said walls in passing through the device, and means are further provided for laterally travers-

ing the combined folder condenser device relative to the draft rolls; and the following is a more detailed description of the present embodiment of this invention, illustrating the preferred means by which these advantageous results may be accomplished:

With reference to the drawing, there is shown in Fig. 1 a portion of a drawing mechanism which for the purpose of illustrating the invention comprises one conventional form of construction utilized in a roving frame in which 10 designates a portion of a stationary frame member or of a roller stand carrying rear and intermediate lower fluted drawing rollers 12, 13, 14 and 15, respectively, and the usual front lower drawing rollers (not shown). The rear and intermediate lower drawing rollers are rotatably supported in any suitable manner in spaced relation to each other, as by the usual bearing blocks 17, 18, 19 and 20 which are adjustably mounted on the roller stand 10 for backward and forward movement to different adjusted positions for varying the relative spacing of the drawing rollers, as is well known construction in the art.

Mounted above the drawing rollers 12, 13, 14 and 15 in cooperating relation therewith are the upper rear and intermediate rollers 21, 22, 23 and 24, respectively, which in a roving frame are usually of short length and they may be supported for rotation in any suitable manner, as by being removably mounted in the vertical slots of the usual cap bar nibs 25 and the cap bar 26 which is pivotally mounted as at 27 on a standard 28 carried by the roller stand. The cap bar 26 may also support the usual upper front rollers (not shown) for cooperating with lower front drawing rollers, as is well known and conventional construction in the art of such roving frame mechanisms for drawing slivers or rovings. These upper rollers are provided with either cork or leather outer covering and they may be weighted in any suitable manner, as is dictated by the customary practice in the art. Between two successive pairs of drawing rollers are placed one or more folder condenser devices 30 with which the present invention is particularly concerned.

In such a roving frame as above described, the successive pairs of drawing rollers operate in succession on the moving sliver or roving with progressively and greatly increased velocities to produce the final desired degree of attenuation of the sliver. Thus, the rollers 13, 22 are rotated faster than the rollers 12, 21 to produce an initial long draft of the sliver S in its travel in the direction of the arrow, as indicated in Fig. 1, from the rear to the front of the drawing mechanism. The sliver S then passes between the rollers 14 and 23 which are rotated at substantially the same velocity as the preceding pair of rollers 13 and 22 so that substantially no appreciable draft is imparted to the sliver in passing across this span. The rollers 15 and 24, however, rotate at much greater velocity than the rollers 14 and 23 so that the sliver in passing between the rollers 14, 23 and 15, 24 receives a second long draft and is considerably attenuated in passing through this second principal draft stage. A second zone of little or substantially no-draft is provided between the rollers 15, 24 and the next succeeding pair of rollers (not shown), and another folder device 30 may be located in this zone between the rollers to cause condensing and folding of the sliver directly after it emerges from drawing engagement with the rollers 15 and 24.

The folder devices 30 may be placed between any two successive sets of drawing rollers, viz., either in one or more of the different principal draft stages of the machine or in one or more of the alternate stages of substantially no-draft. As illustrated in Fig. 1 one of the folder devices 30 is shown as being placed in a stage of substantially little draft, and in the space between the sets of rollers 13, 22 and 14, 23, respectively. Each of the folder condensers 30 may be supported in any suitable manner to project into the path of travel of the moving sliver as by mounting the folder device upon the usual traverse bar 31 which is slidable in a slotted portion of the bearing block 19 as is well known construction in the art.

As illustrated in the drawing, the folder condenser device 30 comprises a trough-like body member 35 of generally arcuate formation open at the top and both ends having an arched floor or bottom guide portion 36 with upwardly extending side walls 37 and 38 of generally arched formation at the longitudinal edges thereof. Depending from the under surface of the body member 35 is a rigid shank member 39 which is integral with the bottom 36 and extends at generally right angles outwardly therefrom and lying substantially in a plane containing a radius of the curved floor 36. The free end of the shank 39 is slotted as indicated at 40, for attachment of the folder device in any suitable manner to a support, such as the traverse bar 31 wherein the folder-condenser device 30 may be reciprocated to and fro longitudinally of the axes of the draft rollers and lengthwise of the drafting machine for causing lateral traverse of the sliver or roving in unison with the usual traversing movement of the usual notched rear sliver guide, as is well known and common practice in the art.

In the form specifically illustrated in Figs. 2 to 6 inclusive, the folder-condenser device is constructed of four pieces of metal in which the bottom guide portion 36 is formed of a piece of sheet metal bent into arcuate formation with the side wall members 37 and 38 being formed of pieces of wire or rod which are integrally secured to the upper surface of the bottom member 36 at the edges thereof in any suitable manner, as by a layer of solder, welding or brazing material 41 and 41' respectively, as indicated in Fig. 6. The cross-sectional shape of the side wall members 37 and 38 is preferably such that the inner faces of the side walls will be of semi-cylindrical cross-sectional formation.

The body member 35 is shown mounted crosswise of the shank 39 at generally right angles thereto, and a flange 42 formed at one end of the shank 39 provides for the attachment of the parts together, the parts being integrally secured as by means of a layer of solder, welding or brazing material as indicated at 43 and 44 in Fig. 2. If desired, the folder 30 may be made of suitable thermoplastic molding materials of the type commonly employed in the plastic molding art, which are capable of being molded and heat set to a hard solid condition, examples of such materials being rubber or a phenolic condensation product of the type known under the trade mark "Bakelite" or other well known resinoid materials and molded under conditions of heat and pressure to provide an integral unitary article of the desired shape and form for accomplishing the condensing and folding results desired.

In Fig. 7 there is illustrated another embodi-

ment of the invention in which, between the rear and front draft rollers **51**, **52**, **61**, **62**, there are provided four sets of intermediate draft rollers **53**, **54**, **55**, **56**, **57**, **58**, **59** and **60**. As illustrated, there is shown two condenser folder devices **50** embodying the present invention placed in two different stages of the drawing mechanism just described, preferably in a stage of substantially no-draft, whereby the sliver receives two separate folding operations prior to being produced into its final drafted state. In this case, the arrangement of the condenser folders **50** thus are located in relation to the draft stages in a manner similar to the position of the scroll devices shown in the patent to E. L. Martin, No. 2,091,153, granted August 24, 1937. If desired, however, the folder condensers **50** may be placed in one or more stages of great draft if the draft roll settings permit the accommodation of the device between the sets of rollers.

In accordance with my invention, it will be apparent that by the construction which we have thus described, there is provided a device for supporting, guiding, condensing and folding the sliver or roving during its passage therethrough to acquire the desired great attenuation of the sliver without the aforementioned "bunching" of the short fibers, fraying or fuzzing difficulties and the formation of weak spots encountered when a considerable draft of the sliver or roving is attempted. Since the delivery end of our folder condenser device is very thin it may be inserted into the bite of the adjacent set of draft rolls very close to the line of nip thereof. The undercut or rounded contour of the side walls enables the lifting up and doubling over the body of the sliver the fibers at both selvedge edges of the sliver, while the arcuate or upwardly curved floor or bottom of the device causes the sliver to climb uphill and hug the floor of the folder so as to impart compression to the fibers to cause a better condensing action on the sliver, and in conjunction with the curved or rounded character of the side walls produces the folding effect desired simultaneously therewith. The amount of curvature of the bottom or floor of the device determines the amount of compression of the fibers. Also, the arcuate length or distance along the curve lengthwise of the folder device may be made of any suitable length depending upon the spacing of the rolls between which the folder device is to be positioned, thus enabling the device to substantially bridge the entire space between the lines of nip of the successive sets of drawing rollers between which the device is positioned. In other words, the arcuate length of the folder is made to correspond to substantially whatever the distance is between the draft roller settings for the different adjustments thereof.

We have not illustrated the mechanism by which all of the various bottom rolls are rotated at the proper speeds, nor the mechanism for reciprocating the traverse bar, as such mechanism is well known, and, per se, forms no part of the present invention.

The foregoing description is directed solely towards the method steps and construction illustrated, but we desire it to be understood that we reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

We claim:

1. A device for treating textile slivers or rovings comprising a body member having a narrow floor portion with upwardly extending side walls, the ends of said body being open, said floor portion being upwardly arched so as to extend lengthwise in the path of travel of the moving sliver when bridging the space between one set of draft rolls and another set of draft rolls in the normal operating position of the device in a drawing mechanism, said side walls converging from the rear toward the front ends of the device for condensing the sliver in passing therebetween, the opposed inner side faces of said side walls being of convexedly curved form in cross section for lifting up and forcing over the body portion of the sliver the fibers lying close to and at the marginal portions of the sliver as the latter advances through the device, the curvature of said inner faces of the side walls extending in a continuous curve upwardly from their meeting line with the floor portion a distance of at least the average thickness of a sliver when the same is acted upon by said walls in passing through the device.

2. A device for treating textile slivers or rovings comprising a shank, a body carried by said shank having a relatively narrow floor portion at one end of said shank and arched upwardly so as to extend in the direction of travel of the moving sliver for bridging the space from one set of draft rolls to another set of draft rolls in the normal operating position of the device in a textile drawing mechanism, said device having arched side walls which extend upwardly from the floor portion and converge from the rear toward the front ends of the device for condensing the fibers of the sliver in passing therebetween, the opposed inner side faces of said walls being of semi-cylindrical cross-sectional formation for directing upwardly and forcing both selvages of the sliver over the body portion of the moving sliver toward the middle portion thereof as the sliver advances through the device, the curvature of said inner faces of the side walls extending in a continuous curve upwardly from their meeting line with the floor portion a distance of at least the average thickness of a sliver when the same is acted upon by said walls in passing through the device.

3. A device for treating textile slivers or rovings comprising a shank, a body carried by said shank having a relatively thin upwardly arched floor portion for extending longitudinally in the direction of travel of the moving sliver in the normal operating position of the device in a textile drawing mechanism, said device having integral inwardly curved side walls which extend upwardly from the floor portion and converge from the rear toward the front ends of the device for condensing the fibers of the sliver in passing therebetween, said side walls being of rod-like formation and arched longitudinally of the device, the opposed side faces of said walls being of semi-cylindrical form and of a height to act on the outer surface of the sliver for upwardly bending and forcing inwardly over the body portion of the moving sliver the fibers disposed at the marginal portions of both selvage edges thereof as the sliver advances through the device.

4. A device for treating textile slivers or rovings comprising a body member having a longitudinally extending upwardly-arched floor portion, and opposite side walls extending upwardly from the bottom of said floor portion to form with the same a longitudinal passage for a textile sliver or roving, the opposite surfaces of said side walls within said passage being convexedly

curved in which the curvature of the inner faces of each side wall extends in a continuous curve upwardly from the meeting line of said side wall with the floor portion a distance of at least the average thickness of a sliver when the same is acted upon by said walls in passing through the device, the front and rear ends of said passage being open for transit of a sliver or roving therethrough.

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