Feb. 10, 1942. E. A. BENTLEY 2,272,787

DRAFTING APPARATUS FOR TEXTILE ROVINGS

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Fig. 1.

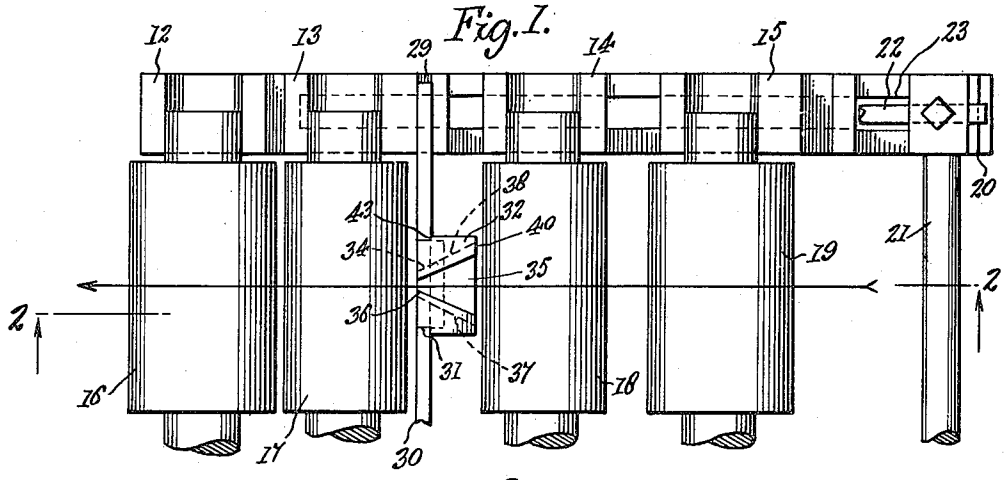


Fig. 2.

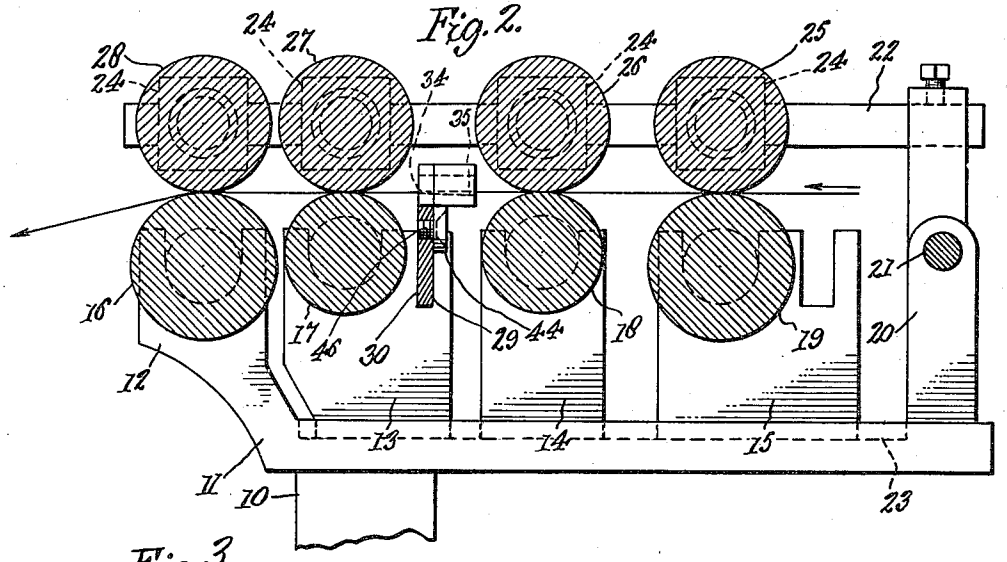


Fig. 3.

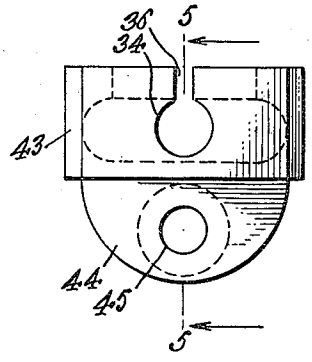


Fig. 4.

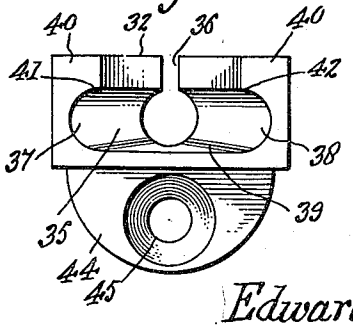
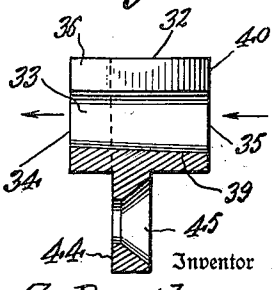


Fig. 5.



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DRAFTING APPARATUS FOR TEXTILE ROVINGS

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Fig. 6.

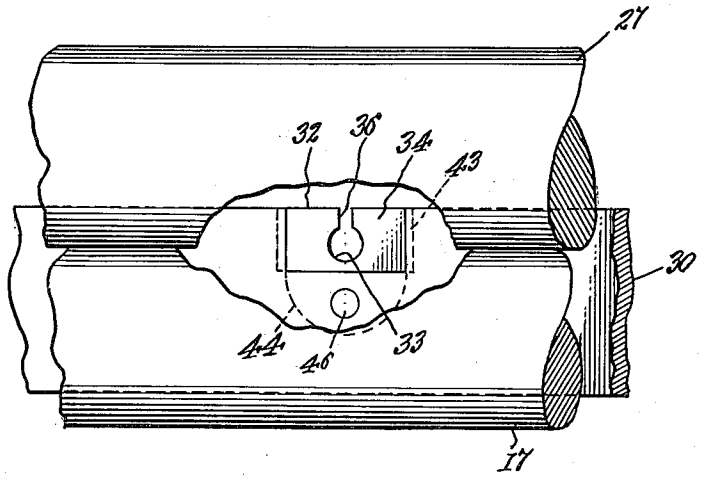


Fig. 7.

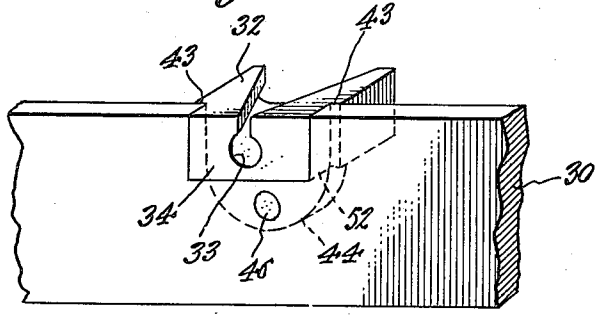
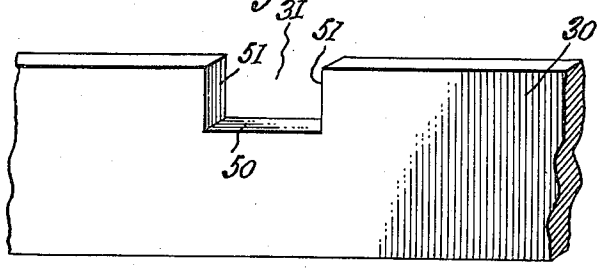


Fig. 8.



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UNITED STATES PATENT OFFICE

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DRAFTING APPARATUS FOR TEXTILE ROVINGS

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Application November 13, 1940, Serial No. 365,524

5 Claims. (Cl. 19—130)

The present invention relates to improvements in drafting apparatus for textile rovings or slivers and more particularly to a condenser for use in connection with long drafting.

Prior to the advent of the modern machines especially designed and capable of performing long draft spinning, short-draft machines were utilized. With these prior machines it was necessary to make a number of separate draft operations before the sliver was fully drawn as the amount of drawing possible in one operation was limited. The modern long draft machine because of the proper condensation of the sliver eliminates a number of the old operations and the results are superior to those attained by the short draft machines. The space between the rolls of the short draft machines was inadequate to properly dispose a long draft condenser and it became necessary for the textile manufacturer at great expense to replace them with the modern high draft machines.

It is an object of the present invention to provide condensing mechanism which, when attached to the short draft machines, converts them to long draft machines with attendant superior results.

Another object of the invention is to provide condensing mechanism which may be fitted to short draft machines without involved reconstruction of the machine.

A still further object of the invention is to provide a condenser which is so constructed and arranged that the reformed and condensed slivers are presented very close to the drafting rolls without tearing or uneven edges.

A still further object of the invention is a condenser so arranged as to size and shape that it may be located in the limited space between rolls of a short draft machine.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a top plan view with parts broken away and showing the preesnt invention.

Figure 2 is a vertical sectional view taken along the line 2—2 of Figure 1.

Figure 3 is a front elevational view of the condenser.

Figure 4 is a rear elevational view of the condenser.

Figure 5 is a vertical sectional view of the condenser taken along the line 5—5 of Figure 3.

Figure 6 is a fragmentary front elevation of a pair of rolls and traverse bar broken away to illustrate the improved condenser in front view.

Figure 7 is a fragmentary perspective view of the traverse bar with the condenser mounted therein, and

Figure 8 is a similar view of the traverse bar alone showing the modification made therein to receive the improved condenser.

Referring first to Figures 1 and 2, the frame selected for the purposes of illustration is one of standard equipment in short draft machines and includes supporting pedestal 10 for the roll stand 11 on which are mounted the roll brackets 12, 13, 14 and 15 for one end of the lower rolls 16, 17, 18 and 19. Similar brackets support the opposite ends of the rolls. Rearwardly of the lower brackets is the stand 20 providing a pivotal support as at 21 for the adjustable cap bar 22. The several roll brackets and the cap bar stand 20 are to a limited extent longitudinally adjustable with respect to each other along ways, one of which is indicated by the numeral 23.

The cap bar 22 adjustably supports the bearings 24 for the upper rolls of which four are here illustrated including the front, intermediate and rear top rolls 25, 26, 27 and 28. These rolls are each in paired relation with the corresponding bottom rolls 16, 17, 18 and 19 and are of the usual types and dimensions. While the drawings show only four pair of rolls with the invention applied only between the intermediate pair of drawing rolls, the number of rolls may be increased or diminished and the condenser employed between several pair of rollers as may be desired.

As thus arranged the several pairs of rolls are rotated at the proper relative speeds to effect the required draft of material passing between them by gears or the like that are usually employed for this purpose. The construction and arrangement of parts thus far described are conventional in short draft and other similar machines and possess no novelty in themselves and require no further description.

In order to properly draft a roving or sliver, it must be narrowed down before it is delivered to the final drafting rolls. This is necessary as the mass of sliver becomes thinner in each operation of drafting causing the selvages to become very ragged or uneven with the result that when it does reach the front roll the sliver is so

wide and thin that instead of the proper twisting a tearing action is had.

This difficulty has been overcome in the long draft machines by suitable condensers disposed between the rolls at some stage of the drafting operation. Such condensers however are too long to be positioned in the limited space between the rolls of the conventional short draft machine heretofore described.

Accordingly the roll bracket 13 and its oppositely disposed mate are provided at their right hand sides, as seen in Figure 2, with vertical slots 29 for the reception of a traversing bar 30 which passes between lower rolls 17 and 18. The bar 30 is provided intermediate its ends with a rectangular recess or notch 31 to receive the condenser of the present invention.

The condenser of the present invention comprises a substantially rectangular body portion 32 with a condensing passage 33 therethrough for the roving. As particularly shown in Figures 2, 3 and 4 the passage flares rearwardly from a circular constricted front or delivery end 34 to a relatively wide, horizontally elongated rear or receiving end 35. A slot 36 connects the top of the circular portion of the passage with the top of the condenser 32 and flares rearwardly to the rear or receiving end 35 as illustrated in Figure 4. The sides 37 and 38 of the condenser passage 33 are of semi-circular shape and this shape is retained throughout the length of the passage. At the same time the floor 39 of the passage is inclined forwardly toward the delivery end 34, such inclination preferably being one-thirty-second of an inch for a purpose to be described later.

As thus constructed it will be noted that the slot 36 provides the condenser with inturned ears 40 which overhang the semi-circular sides 37 and 38. This permits bearing surfaces 41 and 42 to be formed on the undersides of ears 40, such surfaces acting to fold and condense the roving slivers.

Referring to Figure 3 at its sides, the condenser body is notched from its front end 34 rearwardly a distance equal to the thickness of the traversing bar 30 to form shoulders 43. Depending lug 44 is disposed below the body of the condenser, its forward face being flush with the rearward edges of the notch 31 and forming a continuation thereof. A countersunk opening 45 in the lug 44 receives a bolt 46 which secures the condenser to the bar 30.

The notched front end of the condenser is snugly received within the notch 31 of the bar 30, its forward face being flush with the forward face of the bar 30 and its top being flush with the top of the bar. The plane surface formed by the shoulders 43 and the front face of the lug 44 abut against the rear face of the bar and contribute to hold the condenser in place against any longitudinal displacement, even when held by the single fastening 46. In other words the bar is provided with a notch and the condenser has a mutually cut away portion to seat therein fixedly to prevent rocking or displacement of the condenser.

In this manner both the condenser and the bar have the rigidity and sturdiness required for this class of work. No additional space between the rolls is required and the condenser does not project above the top of the bar 30. Thus the present invention due to the flush disposition of the delivery end 34 of the condenser with respect to the corresponding face of the bar 30 enables the bar to be set within one-thirty-second of an inch of the nearest point of the roll 17.

The rear or receiving end 35 of the condenser projects rearwardly from the bar and sets within one-thirty-second of an inch from the nearest point of the roll 26. Both settings permit better control of the fibers while they are being formed. Furthermore the inclined floor 39 provides a slight rise over which the sliver passes to contact an upper part of the roll 27 rather than be forced on a straight line directly to the nip of the rolls 17 and 27. In other words the sliver is, because of said rise, thrown upward so that it will go around the outer surface of the roll somewhat similar to a belt which is operated upon one small and one large wheel. This relieves strain on the sliver, provides a more even flow, and avoids tearing and uneven edges.

As an illustration, take a unit of one hundred fibers running through the old short draft machine. When the fibers were extended and drawn, it was noted that only a limited amount of drawing was possible in one operation. It was necessary to pass the fibers through other rolls and another drawing and continue to do so until the sliver was properly drawn. About six operations were required before the sliver was fully drawn.

In contrast, in the old machine with the present invention attached, the rough outer edges of the roving sliver are folded into the middle of the ribbon sliver, which leaves a smooth outer edge.

As is well known, when drafting takes place, the ribbon gets wider and wider leaving the center of the ribbon very thin and the edges ragged. By the folding operation of the present invention, not only is a smooth outer edge obtained, but the sliver is strengthened in the center which prepares it for twisting. Many of the operations necessary in the short draft machine are eliminated and the results are comparable to those of the new machines especially designed for long draft spinning. Thus a great saving in investment of machinery is possible.

Any suitable material may be used for the condenser 32, such as a light weight and non-corrosive metal. In the present embodiment the condenser is integrally formed of a single piece of light weight copper including the attaching lug 44.

Accordingly it will be apparent that the present invention provides a device for supporting, guiding, condensing and folding the sliver or roving during its passage therethrough in the direction of the arrow. Since the delivery end of the device is flush with the supporting bar it may be inserted between the intermediate rolls of a short draft machine and convert same into a long draft machine. The semi-circular side walls 37 and 38 enable the lifting up and doubling over of the body of the sliver at both selvage edges.

The bearing surfaces 41 and 42 in conjunction with the semi-circular side walls 37 and 38 produce a folding and compressing action on the fibers. While the condenser is relatively short, a sufficient part of it projects back of the bar to give the required condensation.

The operation of the short draft machine with the invention applied as described is similar to that of a modern long draft machine. The sliver is withdrawn from a can container in the direction indicated by the arrow in Figure 1 and passed through the usual rear rolls. After the

conventional drafting operations take place, the sliver enters the condenser which imparts thereto a false twist and condenses the sliver into a solid compact strand during its passage therethrough. In this condition the strand emerges at the front rolls in a considerably attenuated condition to be operated on by the customary flier device whereby the strand is twisted and packaged upon a bobbin for subsequent use.

No mechanism has been illustrated by which the rolls are rotated at the proper speeds, nor the mechanism for reciprocating the traverse bar, as such mechanisms are well known and form no part of the present invention.

In Figure 8 the traverse bar **30** is illustrated, this being a conventional form of traverse bar modified, according to the invention by producing therein a cut away portion having a bottom wall **50** and side walls **51** which are, or may be, substantially parallel and vertical while the bottom wall **50**, which connects the lower ends of the two spaced side walls **51** is substantially horizontal. Such cut away portion opens through the upper edge of the traverse bar **30**.

In Figure 7 the improved condenser is shown as mounted in the bar **30**, the flush condition of the front wall **34** of the condenser with the front wall of the bar **30** being well illustrated, as is also the flush condition of the top of the condenser with the upper edge of bar **30**.

The shoulders **43** are shown as abutting against the rear face of the bar **30**, and as acting to restrict any forward movement of the reduced front end of the condenser through the cut away portion of the bar. These shoulders **43** acting through vertically elongated areas at opposite sides of the condenser not only form stops for holding the condenser in flush position in the cut away portion of bar **30** but also prevent any sidewise rocking of the condenser **32** in the cut away portion of the bar **30**; any such rocking motion also being resisted by the engagement of the side walls of the forward reduced part of the condenser with the side walls **51** of the cut away portion of the bar **50**. The side walls of the front reduced part of the condenser are indicated at **52** and it will be noted that they have a substantially right angular relation to the planes of the shoulders **43**.

Figures 6 and 7 also show how the lug **44** engages against the rear face of the bar **30**, which condition is also seen in Figure 2. The fastening **46**, which may be a single fastening, prevents any accidental or casual rising movement of the condenser with respect to the bar **30**. This fastening between the bar **30** and lug **44** also prevents the condenser from backing out of the cut away portion of the bar. Both the condenser and its lug **44** tend to reinforce and strengthen the bar **30** where it has been weakened by being cut away.

Figure 6 shows the relation between the condenser passage **33** and the nip of the rolls **17** and **27**. For a bar **30** of five-thirty-seconds of an inch in thickness the length of the cut away portion may be three-fourths of an inch and its height thirteen-thirty-seconds of an inch with the forward reduced portion of the condenser dimensioned accordingly to fit snugly therein.

The condenser may be one-half inch long with its top slot **36** one-half inch wide at its rear end converging to three-thirty-seconds of an inch at its forward end. The rear wider part of the condenser in horizontal measurement may be seven-eighths of an inch. The central front round opening is advantageously three-sixteenths of an inch in diameter while the height between the floor **39** and the bearing surfaces **41** and **42** is generally seven-thirty-seconds of an inch although this somewhat varies due to the inclination of the floor **39**, such floor at its wider rear entrance end being above the external bottom of the condenser one-sixteenth of an inch and rising to its front outlet end to three-thirty-seconds of an inch.

The vertical height of the lug **44** at its middle deepest portion may be three-thirty-seconds of an inch and the thickness of the lug **44** one-eighth of an inch while the diameter of the opening **45** is five-thirty-seconds of an inch except that it is three-eighths of an inch at the widest portion of its countersunk taper.

These dimensions will enable those skilled in the art to make a condenser of satisfactory character for an old short draft machine.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. In a draft roving apparatus having spaced pairs of drafting rolls, a traversing bar having its forward edge disposed in proximity to one of said rolls, said bar having a recess in its upper portion, a condenser having a reduced forward portion corresponding in shape and size to the bar recess and received therein with its forward face disposed in flush relation to the edge of the bar and having an enlarged rear portion with shoulders engaging the rear face of said bar, the rearward face of the condenser being disposed in proximity to another of the rolls, means to rigidly secure the condenser to the bar, said condenser having a condensing passage extending longitudinally thereof, said passage flaring from a generally circular shape at its forward portion to a horizontally elongated shape at its rearward portion.

2. In a draft roving apparatus having spaced pairs of drafting rolls, a traversing bar having its forward edge disposed in proximity to one of said rolls, said bar having a recess in its upper surface, a condenser having a reduced forward portion corresponding in shape and size to the bar recess and received therein with its forward face disposed in flush relation to the edge of the bar and having an enlarged rear portion with shoulders engaging the rear face of said bar, the rearward face of the condenser being dissposed in proximity to another of the rolls, means to rigidly secure the condenser to the bar, said condenser having a condensing passage extending longitudinally thereof, said passage flaring from a generally circular shape at its forward portion to a horizontally elongated shape at its rearward portion, said condenser having a slot connecting the passage with the upper surface of the condenser body, said slot flaring from the front to the rear of the condenser.

3. In a draft roving apparatus having spaced pairs of drafting rolls, a traversing bar having its forward edge disposed in proximity to one of said rolls, said bar having a recess in its upper surface, a condenser having a reduced forward portion corresponding in shape and size to the bar recess and received therein with its forward face disposed in flush relation to the

edge of the bar and having an enlarged rear portion with shoulders engaging the rear face of the bar, the rearward face of the condenser being disposed in proximity to another of the rolls, means to rigidly secure the condenser to the bar, said condenser having a condensing passage extending longitudinally thereof, said passage flaring from a generally circular shape at its forward portion to a horizontally elongated shape at its rearward portion, said condenser having a slot connecting the passage with the upper surface of the condenser body, said slot flaring from the front to the rear of the condenser, the sides of said passage retaining their semi-circular shape throughout their length to provide bearing surfaces for retention of the fibers passing therethrough.

4. In a short draft roving machine wherein roll brackets support a pair of front rolls, closely spaced pairs of intermediate rolls and a pair of rear rolls, an attachment for converting said short draft machine to a long draft machine, said attachment comprising a relatively thin bar mounted on said brackets between the closely spaced pairs of intermediate rolls for traversing movement therebetween and having its forward edge disposed in proximity to one of said intermediate rolls, said bar having a recess in its upper portion, a condenser having a reduced forward portion corresponding in shape and size to the bar recess and received therein with its forward face disposed in flush relation to the edge of the bar and having an enlarged rear portion with shoulders engaging the rear face of the bar, the rearward face of the condenser being disposed in proximity to another of the intermediate rolls, and means to rigidly secure the condenser to the bar, said condenser having a condensing passage extending longitudinally thereof and flaring from a generally circular shape at ite forward portion to a horizontally elongated shape at its rearward portion.

5. In combination with a traversing bar having a substantially rectangular cut away portion opening through its upper edge, a condenser having a forward reduced portion fitting flush in said cut away portion and having an enlarged rear portion with shoulders engaging the rear face of said bar, and means on said condenser constructed and arranged to permit attachment to said bar.

EDWARD ALLEN BENTLEY.