May 4, 1937. T. W. LAWTON 2,079,122

DRAFTING MECHANISM

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Fig. 1.

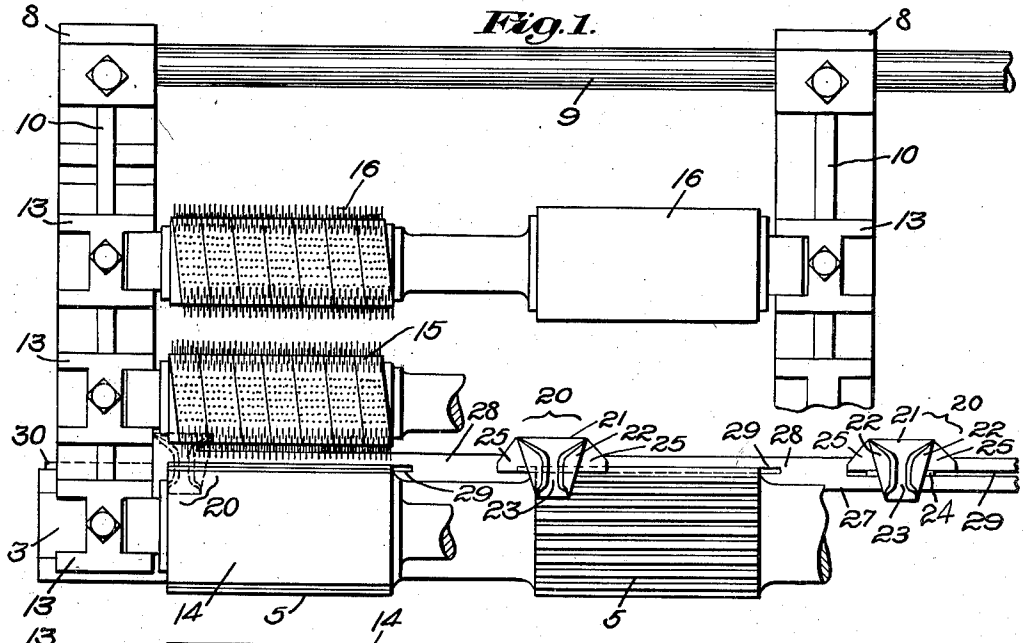


Fig. 2.

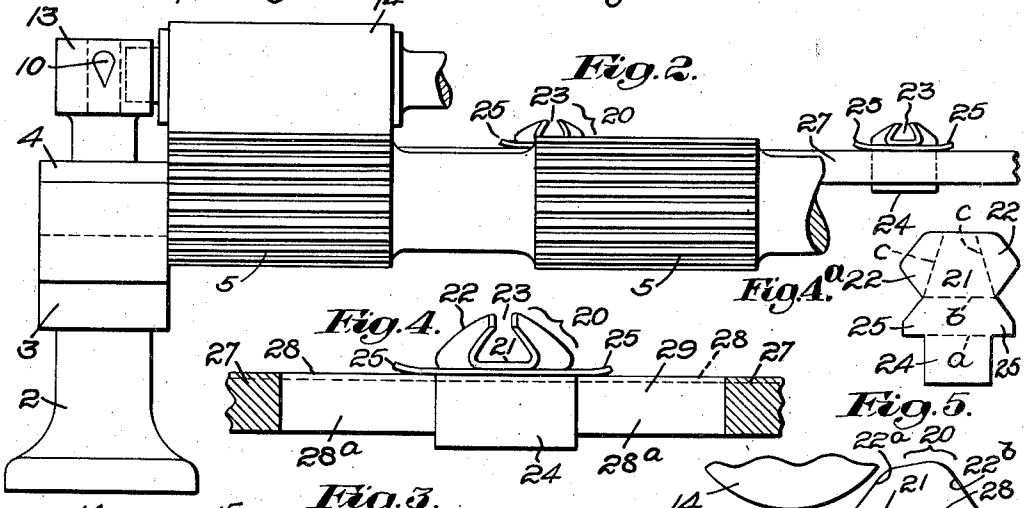


Fig. 4.

Fig. 4a.

Fig. 5.

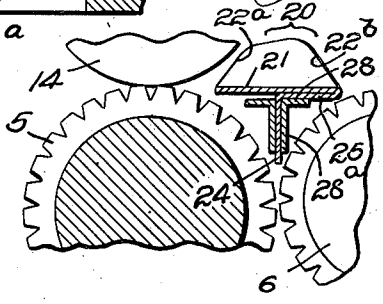
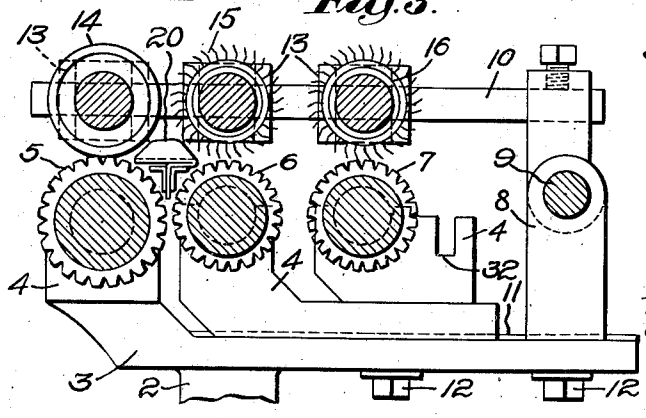


Fig. 3.



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Fig. 6.

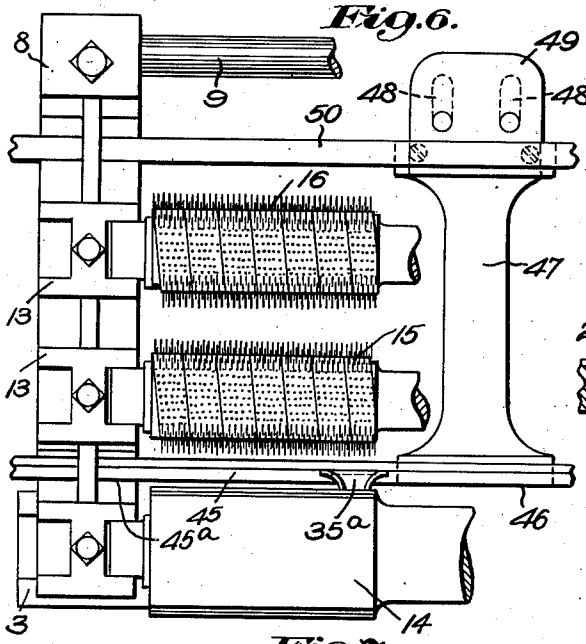


Fig. 11.

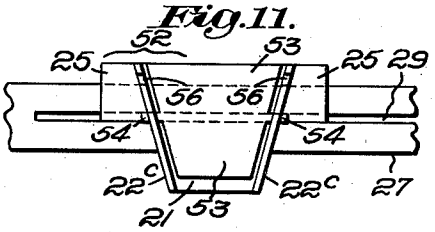


Fig. 12.

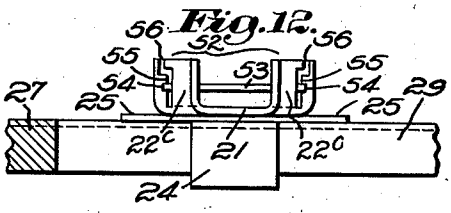


Fig. 13.

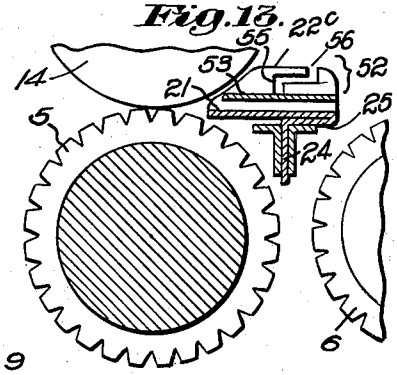


Fig. 7.

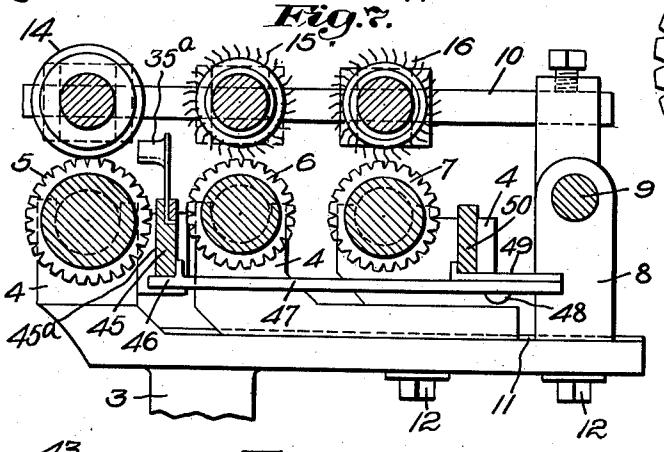


Fig. 14.

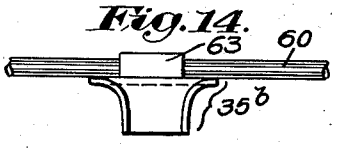


Fig. 8.



Fig. 15

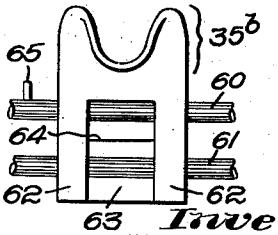


Fig. 16.

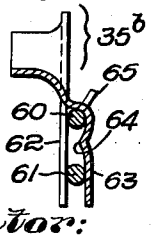


Fig. 9

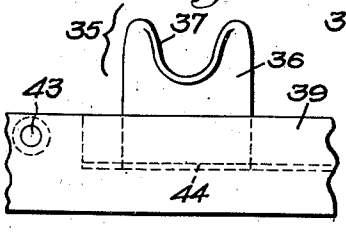
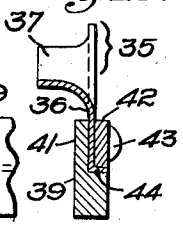


Fig. 10.



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UNITED STATES PATENT OFFICE

2,079,122

DRAFTING MECHANISM

Thomas W. Lawton, New Bedford, Mass.

Application March 29, 1935, Serial No. 13,645

9 Claims. (Cl. 19—130)

The present invention is concerned with apparatus or means for drafting textile fibers. It aims to provide improved mechanism for the purpose, particularly adapted for use in connection with high drafting of cotton, as preliminary to or attendant on the spinning operation.

In the drawings illustrating by way of example certain embodiments of the invention,

Fig. 1 is a top plan view of a portion of a drafting frame embodying one form of the invention, the upper front and intermediate rolls being broken away, the illustrated frame being typical of those in the classes of slubbers, intermediate, roving and spinning frames;

Fig. 2 is a front elevation of the apparatus of Fig. 1;

Fig. 3 is a vertical longitudinal section through the same;

Fig. 4 is an enlarged illustration, in front elevation, of one of the guiding devices;

Fig. 4*a* shows a blank for the latter;

Fig. 5 is a vertical longitudinal section upon a similar scale as in Fig. 4, through one of said guide devices and illustrating its relation to adjacent rolls;

Figs. 6 to 10 inclusive illustrate modified embodiments of the invention; in said figures

Fig. 6 is a top plan corresponding to a portion of Fig. 1,

Fig. 7 is a longitudinal vertical section corresponding to Fig. 3, and

Figs. 8 to 10 are respectively a plan, a front elevation, and a vertical section of one of the guide devices like those of Figs. 6 and 7, upon an enlarged scale, but showing them as independently movable;

Figs. 11 to 13 illustrate a further modification, Figs. 11 and 12 respectively being a plan and a front elevation of a guide device, and Fig. 13 being a section of the same, also illustrating its relation to the adjacent rolls, similarly as in Fig. 5; and

Figs. 14 to 16 illustrate a further form of guide means, said figures being respectively a plan, a front elevation and a vertical section.

Referring first to Figs. 1 to 5, the frame selected for the purposes of illustration, as representative of textile drafting apparatus such as slubbers, intermediate, roving and spinning frames, includes supporting pedestals 2 for the roll stand 3 on which are mounted the roll brackets 4, 4 for the lower rolls 5, 6 and 7; see particularly Fig. 3. Rearwardly of the roll brackets are the stands 8 providing pivotal support as at 9 for the adjustable cap bars 10. The several roll brackets and the cap bar stand 8 preferably are longitudinally adjustable with respect to each other, along ways of which one is seen at 11. The brackets are fixed in selected position as by means of the clamp screws 12, 12.

The cap bars 10 adjustably support the bearings 13 for the upper rolls of which three are here illustrated including the front, intermediate and rear top rolls 14, 15 and 16 respectively, in paired relation to the corresponding bottom rolls 5, 6, and 7. The rolls, both in the lower and the upper positions, may be of the usual types and dimensions, fluted steel rolls generally being used in the lower portions and leather surfaced or other rolls in the cooperating upper positions. Preferably, however, and as herein illustrated, one or more of the top rolls, either the rear top roll 16 or the intermediate top roll 15, or both, have drafting or fiber engaging circumferential portions comprising a multiplicity of resilient wire points, as disclosed and claimed in the patent to T. P. Rooney No. 1,933,222, dated October 31, 1933. The sliver condensing and guiding mechanism of the present invention, to be described, is especially useful in cooperation with such wire-pointed roll.

Under high draft conditions it is found that the fibers of the sliver sometimes tend to spread and throw out laterally to an objectionable extent, causing irregularities in the yarns. In accordance with the present invention this difficulty is overcome by confining the fibers and suitably guiding the sliver in its travel between adjacent pairs of rolls, such as the intermediate and the front sets. For this purpose, as illustrated in Figs. 1 to 5, an appropriate number of guides 20 are provided, at least one for each sliver, roving or yarn passing through the particular frame. These guides or condensers 20 have the general form of a laterally flattened tapered tube. As further contrasted with devices such as heretofore set behind the rearmost rolls of a series, said guides 20 are open at the top, so that the sliver may initially be entered into them broadside rather than having to be threaded through lengthwise.

In the illustrated example of Figs. 1 to 5, each guide 20 has a substantially flat bottom wall 21, wider at the rear and tapered forwardly. Along the side edges of the bottom wall are the inturned side walls or ears 22. These approach each other sufficiently to retain the sliver, in cooperation with the bottom wall 21, during the drafting operation and to produce a condensing effect upon it, said side members 22 having a similar forward

taper as that of the bottom wall. They are spaced along their inner edges, however, adequately to receive the sliver broadwise between them, for threading purposes, through the top entrance or throat **23**.

Any suitable material may be used for the guides **20** such as a light weight and preferably non-corrosive metal. In the embodiment of Figs. 1 to 5 each guide **20**, see particularly Fig. 4, is integrally formed from a single piece of light sheet metal such as copper, and includes a downwardly projecting fin **24** and a horizontal laterally extended flange **25**, whereby the guide is positioned for movement lengthwise the rolls. At the rear edge of the flange **25** the material is reversed forwardly upon itself to provide the bottom guide wall **21**, the latter being upset along its forwardly convergent side edges to form the enclosing ears **22**, as previously described. A blank for a condensing guide such as those of Figs. 1 to 5 is illustrated in Fig. 4*a*, from which it will be understood that the piece is folded in one direction along the lower horizontal dotted line *a*, reversed along the intermediate parallel line *b*, and the ears **22** turned up and inwardly along the lines *c*. The particular material and manner of formation however may be widely varied within the scope of the invention.

In the form illustrated in Figs. 1 to 5, the condenser guides **20** are operatively supported on a carrier comprising a rail **27** set in the space between two adjacent pairs of rolls, as seen, for example, in Figs. 3 and 5. In its cross-sectional T-shape as shown, the upper strip **28** of said carrier presents a track for the horizontal flange **25** of the guides **20**. Longitudinal slots **29** are formed in said upper strip **28**, opposite the respective rolls, and extending downwardly through the vertical part **28a** of the T-rail. The vertical fins **24** of the guides are set in said slots **29**, wherein they are held and guided for free movement lengthwise the bar **27**, within the limits of the slots, which latter are of a length approximating that of the adjacent rolls. Each guide **20** accordingly is freely traversable along the rolls, over the entire active drafting portions of the latter. The rail **27** may be mounted, detachably or otherwise, on any convenient stationary part of the frame, such as the front roll bracket **4**, or upon the cap bars as by means of attaching pieces or fingers indicated at **30** in Fig. 1.

As apparent from the foregoing description and the drawings, the rail is proportioned and arranged to conform to the space between any given pairs of rolls and to present no interference with the latter. It may be employed with rolls of any of the different sizes used for drafting purposes and under varied spacing of the rolls. In the arrangement of Figs. 1 to 5, for example, the lower front roll has a diameter of one inch while the adjacent lower intermediate roll is of seven-eighths inch diameter, the latter being the smallest roll in general use. Even with the smaller rolls and close settings thereof, affording an equilateral triangular space between them of but about one-quarter inch to a side, guides such as the elements **20** and their supporting rail **27** may readily be installed in the manner illustrated. The rail may be other than T-shape in section, but said formation has been found particularly suited to the purpose, in actual practice, and has the additional advantages of rigidity and strength.

The described construction and arrangement of the condensing guides **20** and of their support are such that the guides are in extremely close relation to the drafting rolls, leaving a clearance which may be as little as .005 inch. The guides have a length, in the direction of the draft, appropriate to the particular size and setting of the rolls, so as to span and fill in substantially the entire space between the nip lines of consecutive pairs of rolls. Accordingly the sliver is effectively guided and confined through pratically its entire path between one pair of rolls and the next. Since these guides require no support by the rolls themselves and are kept out of actual contact with the rolls, they are not affected in any way by the fluted or other surface formations of the latter. Guides of different lengths may be interchangeably substituted under different settings of the rolls or for different sized rolls. To effect such interchange it is only necessary to lift any given guide from its carrier rail **27** and drop another in place in the slot **29** therein.

It will be noted that the floors **21** of the guides **20** lie substantially in the plane of the nip lines of the rolls between which they are positioned, so as to have effective supporting and guiding engagement with the sliver. Such location of the guides is made possible, even where the rolls are closely set, as in Figs. 1 to 5, both by the described structure and arrangement of the rail **27**, and also by reason of the generally triangular or truncated pyramidal form of the guides themselves, as viewed in side elevation. As seen particularly in Figs. 3 and 5, the confining ear portions **22** of the guides are oppositely inclined, upwardly and toward each other, at their front and rear portions **22a** and **22b** respectively, whereby they conform to the trangular space available between the upper rolls, above the nip line.

Drafting frames of which the apparatus of Figs. 1 to 5 is typical customarily are equipped with mechanically traversed trumpets for vibrating the sliver along the rearmost rolls while guiding and entering it between them. Such traversing trumpets are generally mounted on a cross bar sliding in the guide slots in the rear roll bracket, as herein shown in Fig. 3 at **32**, the cross bar and trumpet being omitted for the sake of clearness. The light, freely movable guides **20** of the present invention facilitate and supplement said desired traversing action of the sliver as imposed by the driven trumpet rearwardly of the back rolls, said guides freely shifting or fluttering lengthwise the rolls, following the movement of the sliver, while at the same time confining or condensing and guiding it throughout substantially its entire travel from any one pair of rolls to the pair next in front.

Figs. 6 to 10 illustrate further embodiments of the invention, again in connection with a typical drafting frame. Parts not otherwise referred to may be similar to corresponding parts in the previous figures, including the roll stand **3**, the brackets **4** for the lower rolls **5**, **6**, and **7**, and the upper rolls **14**, **15**, **16** journaled on the cap bars **10**. Either or both the intermediate and the rear top rolls **15**, **16** may be of the wire pointed construction of Patent 1,933,222 previously referred to.

As in the previous figures, condensing and guiding means for the sliver, during its travel between adjacent pairs of rolls, is provided. As best seen in Figs. 8 to 10, the guides proper, indicated as a whole by the numeral **35**, each comprise a flat upright part or base **36** supporting an approximately U-shape open-top guiding and condensing portion or trough **37**, of substantial extent in the direction of travel of the sliver.

Said guide trough 37 has a relatively wide flaring mouth 38 for the sliver, see Fig. 8, and tapers forwardly, in a generally similar manner as in the preceding figures.

The trough-like guides 35 of Figs. 8, 9, and 10 are mounted for independent free movement lengthwise the rolls, as by means of a carrier or rail 39 extending between stationary parts of the frame, such as the roll brackets or the cap bars, as in Figs. 1 to 5. The rail 39 is provided with tracks 40, Fig. 8, for the respective guides, said tracks herein formed by longitudinal recesses in a narrowed portion or flange 41 along the top of the rail. A retaining strip 42 secured along the back of the flange 41, as by means of the screws 43, provides a rear wall for the tracks 40. The bases 36 of the guides 35 have an offset foot at their lower ends as at 44 received in a longitudinal recess in the under face of the retaining strip 42. The condensing guides 35 are thus held and guided for free traversing movement lengthwise the rolls, but may readily be removed for interchange or replacement.

Similar guide elements as in Figs. 8 to 10 are shown in Figs. 6 and 7. In said latter figures, however, the guides 35^a are fixed upon a bar 45 slidably positioned between adjacent lower rolls of the series, herein the front and the intermediate rolls, and provision is made for traversing the bar itself, while the guides retain their fixed relation with respect to the bar.

As illustrated in Figs. 6 and 7, the guide-supporting bar 45 is carried at the fore end 46 of a horizontal arm 47 adjustably attached, as by the slot and screw connections 48, 48, to a bracket 49 secured to the usual traverse bar 50. The latter is slidably supported in the slot 32 in the rear roll bracket 4 and carries the customary trumpets (not shown), behind the rearmost rolls, for entering the sliver between them. Said rear bar 50 is traversed in the known manner and by any suitable mechanism, to shift the sliver in one and the opposite direction lengthwise the rolls. The guide elements 35^a of Figs. 6 and 7, operating between pairs of rolls, are preferably set on their supporting bar 45 in line with the trumpets on the traverse bar 50. By means of the supporting arm 47 and its described connections with the rear traverse bar 50 and the forward bar 45, the guides 35^a are caused to shift in unison with the traversing movement of the rear trumpets. Said auxiliary or forward bar 45 may additionally be supported and guided in ways mounted on or formed in a convenient part, such as the adjacent roll brackets, as indicated at 45^a. Guide mechanism such as illustrated in Figs. 6 to 10 is more particularly adapted for heavier drafting operations and in instances where a relatively wide spacing of the rolls is desired. It will be understood, however, that guide elements such as the members 20 of Figs. 1 to 5 may be employed in connection with a mechanically traversed support and operating connections therefor such as the bar 45 and associated parts of Figs. 6 and 7.

In Figs. 11 to 13 there is illustrated a guide and condensing element 52, of generally similar construction as in Figs. 1 to 5 and which is adapted for use in connection with any of the figures previously described. Similar reference numerals are used in Figs. 11 to 13 for parts corresponding to those of Figs. 1 to 5. The lower front and intermediate rolls 5 and 6 and the corresponding upper rolls 14, 15 are indicated in Fig. 13. The guides are slidably mounted on the carrier or rail 27 like that of Figs. 1 to 5. The base portions 21, 24, 25 of the guides 52 are similar as in said figures.

The forwardly tapering side walls or ears 22^c, 22^c, however, stand substantially upright, and serve to position a floating top plate or weighting member 53. This weighting member or float 53 is shaped to conform with the interior of the guide 52 as a whole. It is held in operative position, wherein it rests and floats upon the sliver passing beneath it, as by means of the projections or pins 54, 54 at its opposite sides received in vertical guide slots 55, 55 in the respective side walls 22^c. If desired the guide slots 55 may have offset extensions 56 opening at the upper edges of the side walls 22^c. By reason of such offset the float 53 is held against accidental displacement but may be lifted and disengaged from the guide proper, when desired, as for the purpose of initially entering the sliver broadwise into the open top guide, or for discarding the float in such instances as it is not required.

With a construction such as shown in Figs. 11 to 13 there are obtained not only the desired guiding and condensing effects upon the sliver, but also that of an augmented and adjustable drag upon the sliver and prolonged drafting engagement with it, affording excellent results in connection with high drafting and particularly in conjunction with the use of wire-pointed rolls as in the patent previously referred to. It will be understood that float elements 53 as in Figs. 11 to 13 but of various weights may be interchangeably substituted to suit the requirements of any particular drafting conditions.

Figs. 14 to 16 illustrate a modified form of support for a guide 35^b of generally similar character as in Figs. 6 to 10. In this instance said guides are mounted for individual free sliding movement along and upon a pair of wires 60, 61. The latter extend axially of the rolls between the desired pairs thereof and are supported by and between fixed parts of the drafting frame, similarly as the rail 27 in Figs. 1 to 5 and Figs. 11 to 13 or 39 of Figs. 8 to 10. The lower portions of the guides 35^b are bifurcated to straddle said wires. As illustrated in Figs. 14 to 16, said guides are formed with spaced legs 62, 62 and an intermediate tongue 63 struck rearwardly from the plane of the legs 62, the wires 60, 61 being receivable between the legs 62, the tongue 63 as seen in the figures. The tongue 63 may have one or more projections or ribs 64 positioned to underlie the corresponding wire 60 or 61. The guides 35^b as illustrated may readily be set onto or removed from their supporting wires, the tongues 63 yielding rearwardly as they are set in place and springing back to position their ribs 64 below the adjacent wire 60 or 61, thereby to retain the guides against unintentional displacement. The guides may be limited in their traversing movements as by stop pins or the like 65 adjacent the ends of the drafting portions of the respective rolls.

The present invention is not limited to the particular embodiment thereof illustrated and described herein, its scope being set forth in the following claims:

I claim:

1. A condensing guide for a sliver, in textile drafting frames including slubbers, intermediate, roving and spinning frames, said guide being a one-piece sheet metal member comprising a horizontal flange adapted for slidably seating the guide, a substantially vertical positioning and guiding fin, and a forwardly tapered sliver-guid-

ing funnel-like portion comprising a folded bottom wall overlying said flange.

2. A condensing guide for a sliver, in textile drafting frames including slubbers, intermediate, roving and spinning frames, said guide being a one-piece sheet metal member comprising a horizontal flange adapted for slidably seating the guide, a substantially vertical positioning and guiding fin and a forwardly tapered sliver-guiding funnel-like portion comprising a folded bottom wall overlying said flange, said funnel-like portion having a longitudinal passage for entering the sliver into it in a broadwise manner.

3. A condensing guide for a sliver, in textile drafting frames including slubbers, intermediate, roving and spinning frames, said guide comprising a supporting base, a forwardly tapered guide trough, and a float element held in vertically movable position between the side walls of said guide trough and adapted to rest by gravity upon the sliver.

4. A condensing guide for a sliver, in textile drafting frames including slubbers, intermediate, roving and spinning frames, said guide comprising a supporting base, a forwardly tapered guide trough, including a bottom and side walls, and a weighting element vertically movably positioned between the side walls of the trough so as to float upon the sliver.

5. In a textile drafting apparatus, in combination, a plurality of sets of upper and lower rolls rotatably supported on a frame, a stationary rail located between two adjacent sets of rolls, parallel with the roll axes, a guide-supporting track formation on the rail, a condensing guide having a horizontal flange adapted for slidably seating the guide upon the rail, a substantially vertical positioning and guiding fin, and a forwardly tapered sliver, guiding funnel-like portion for said guide comprising a folded bottom wall overlying said flange.

6. In a textile drafting apparatus, in combination, a plurality of sets of upper and lower rolls rotatably supported on a frame, a stationary rail located between two adjacent sets of rolls, parallel with the roll axes, a guide-supporting track formation on the rail, and a condensing guide slidably supported on said rail, said guide comprising a supporting base, a forwardly tapered guide trough, and a float element held in vertically movable position between the side walls of said guide trough and adapted to rest by gravity upon the sliver.

7. In a textile drafting apparatus, in combination with a plurality of sets of upper and lower rolls rotatably supported on a frame, a stationary rail located between two adjacent sets of rolls, parallel with the roll axes, a guide-supporting track formation on the rail, including spaced front and rear walls, and a sliver-guiding device positioned thereby for free traversing movement along substantially the entire longitudinal extent of the drafting portions of the adjacent rolls, said guide comprising a laterally extended supporting and guiding base received by the rail, a substantially vertical guiding and retaining fin depending from said base at a point intermediate its length in the direction of the sliver movement, said fin being received between the front and rear walls of said track formation, and a longitudinally open troughed portion for guiding and condensing the sliver, said troughed portion being forwardly tapered and including side walls inclining downwardly in opposite directions at their front and their rear portions and conforming the guide device for operative reception in the space between two relatively closely adjacent sets of rolls.

8. A condensing guide for a sliver, in textile drafting frames including slubbers, intermediate, roving and spinning frames, said guide comprising a supporting base, a forwardly tapered guide trough, and a float element held in vertically movable position between the side walls of said guide trough and adapted to rest by gravity upon the sliver, the construction and arrangement being such that the float element may be disengaged sufficiently for entering the sliver broadwise into the guide trough.

9. A condensing guide for a sliver, in textile drafting frames including slubbers, intermediate, roving and spinning frames, said guide comprising a supporting base, a forwardly tapered guide trough, and a float element held in vertically movable position between the side walls of said guide trough and adapted to rest by gravity upon the sliver, said float element being readily bodily removable from the guide proper.

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