March 3, 1953 J. P. LEMAIRE 2,629,900

DRAWING-HEAD OF SPINNING MACHINES

Filed Aug. 4, 1947 2 SHEETS—SHEET 1

Fig. 3

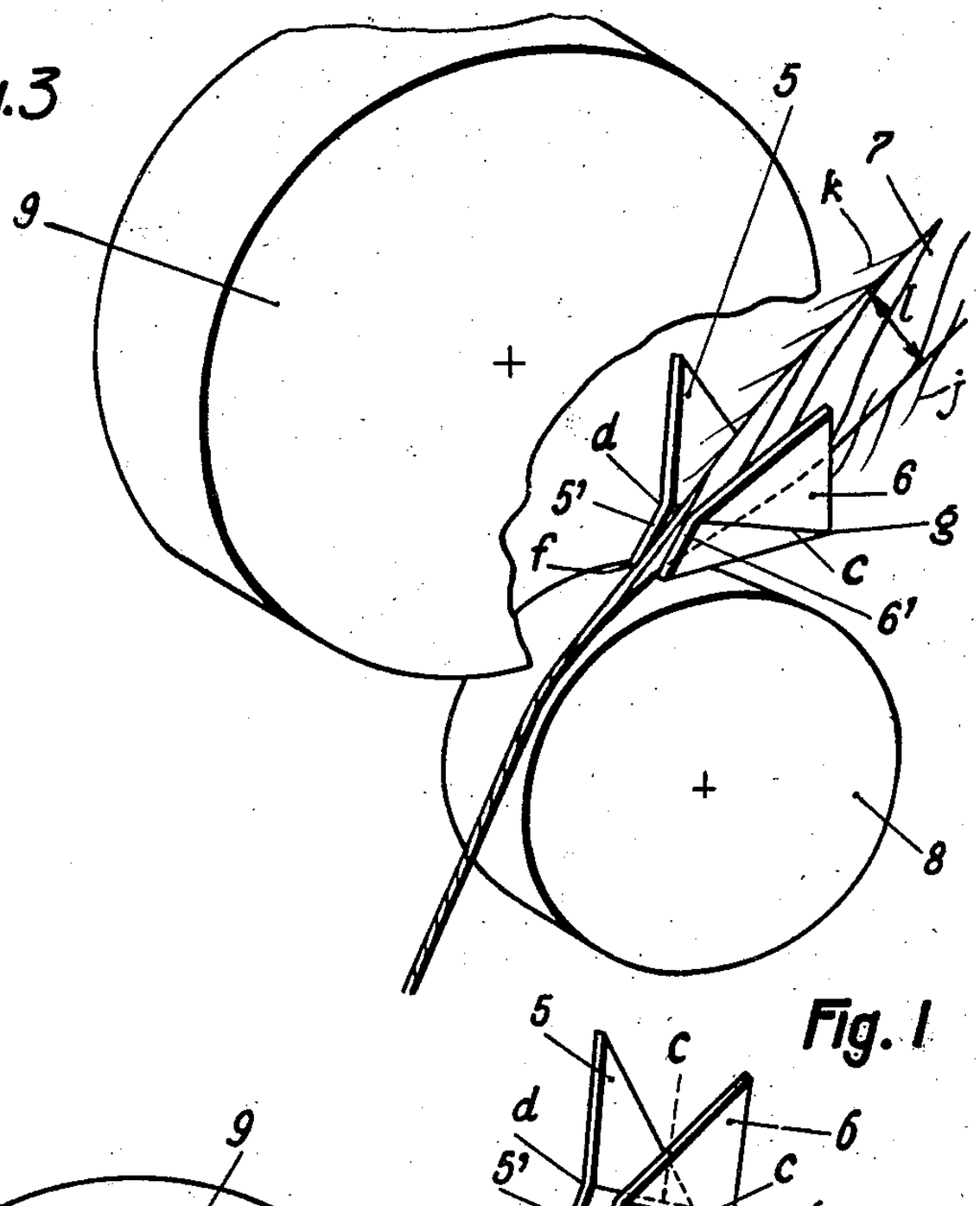
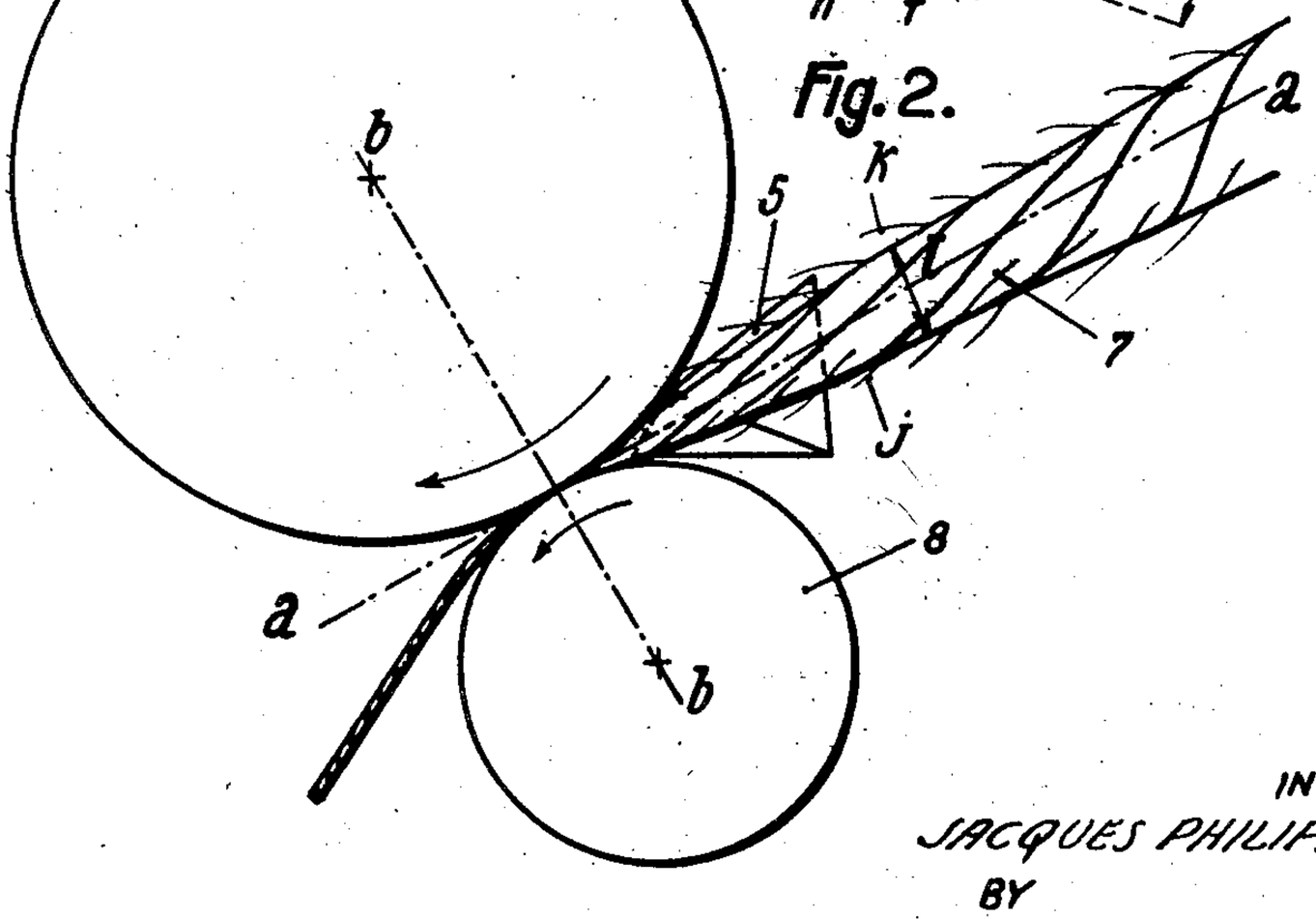


Fig. 1

Fig. 2.



INVENTOR
JACQUES PHILIPP LEMAIRE
BY
Robert C. Burns
ATTORNEY.

March 3, 1953 J. P. LEMAIRE 2,629,900

DRAWING-HEAD OF SPINNING MACHINES

Filed Aug. 4, 1947 2 SHEETS—SHEET 2

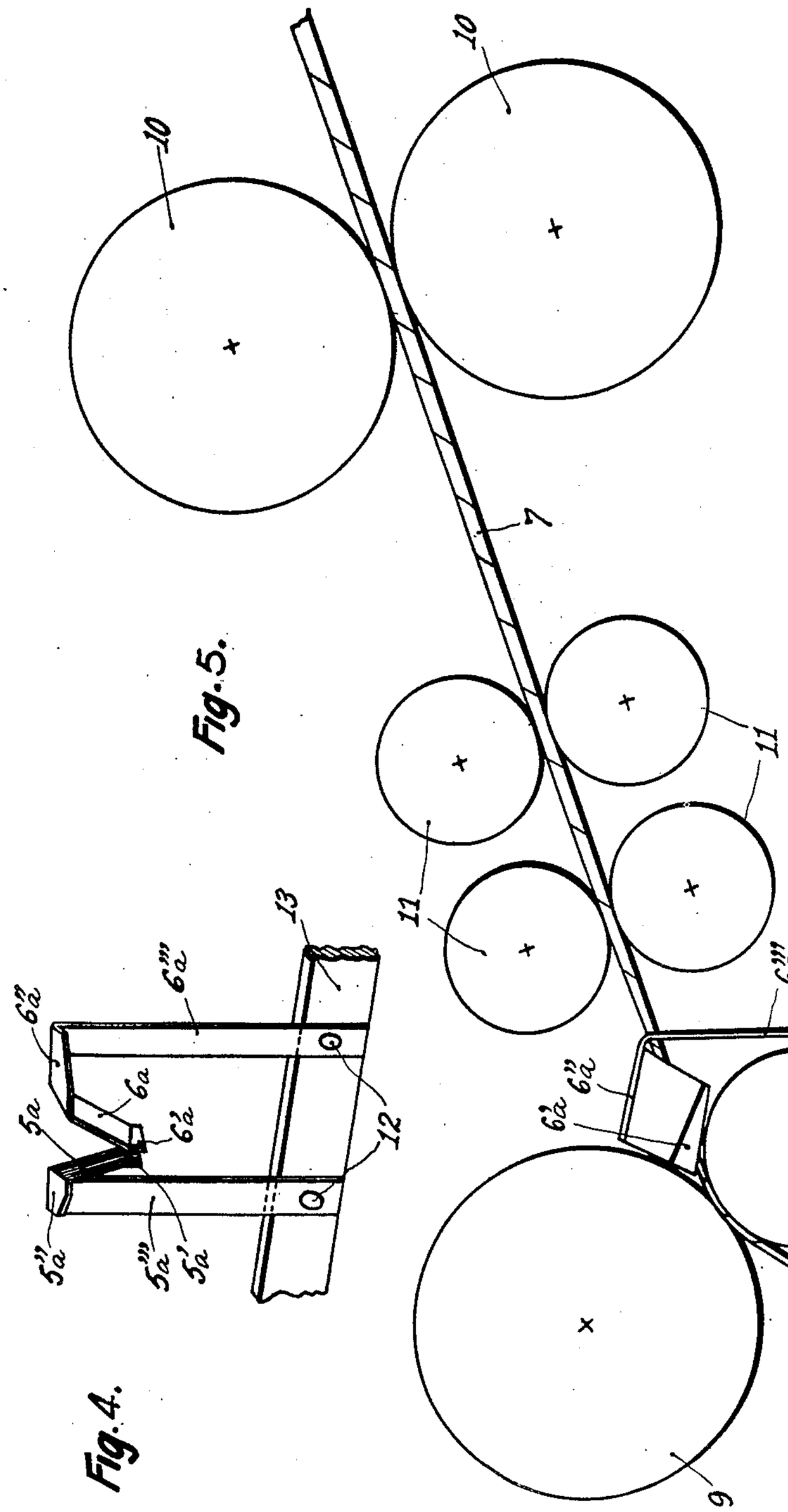


Fig. 5.

Fig. 4.

INVENTOR
JACQUES PHILIPP LEMAIRE;
BY
Robert E. Burns
ATTORNEY

Patented Mar. 3, 1953

2,629,900

UNITED STATES PATENT OFFICE

2,629,900

DRAWING-HEAD OF SPINNING MACHINES

Jacques Philippe Lemaire, Lille, France

Application August 4, 1947, Serial No. 765,839
In France June 24, 1941

Section 1, Public Law 690, August 8, 1946
Patent expires June 24, 1961

1 Claim. (Cl. 19—130)

1

The invention relates to the drawing-heads of spinning machines and has for its object to improve said drawing-heads so as to enable them to carry out the condensation of rovings in view of obtaining high drafting as well as improving the quality of the yarn.

It is known that, in spinning, the rovings swell and expand as they come close to the drawing rollers.

This expansion is due to the releasing of the fibres of the roving as a result of the draft. By destroying the twist or matting of the roving, the draft destroys at the same time the cohesion of the fibres, which, being released, expand from each other.

This dispersion, which is more or less marked, according to the nature and the length of the fibres forming the roving, makes spinning more difficult and decreases the quality of the yarn produced.

Effectively these fibres which are introduced in such a dispersed state between the drawing rollers issue naturally out of them in the same state and, in the yarn when formed, only central fibres constitute a homogeneous helical bundle; the lateral fibres being simply coiled more or less uniformly, according to their distance from the center, round this central bundle; hence, they contribute only partially to the resistance of the yarn and give the latter an unsightly hairy aspect. If the roving, due to its size or to the swelling nature of its fibres, presents itself in an excessively enlarged state before the drawing rollers, some fibres which are excessively remote from the center may even fail to be gripped by the twist and fly as waste.

On account of the size of the roving, it is therefore necessary, in view of effecting high drafts, to prevent this expansion by concentrating or condensing the fibres at their entrance between the drawing rollers.

This concentration or condensation has hitherto been mainly effected by means of channel guides provided with converging turned up edges or by means of funnel-like guides whose upper part is allotted for the passage therethrough of the roving and whose reduced ends extend between the drawing rollers up to their nipping line.

Obviously, the roving fed through such guiding members leaves the same in a condensed state and it enters in a like condensed state between the drawing rollers. This advantage is however partly cancelled due to the fact that, on account of the massaging action exerted upon the roving by the side and bottom walls of the guide and

2

the extended friction to which it is submitted therein, the drawing of said roving becomes defective, the more so if the drafted roving is a twisted roving.

It is well known indeed that the fibres gripped and pulled by the drawing rollers always entrain with them, due to their high velocity, a certain percentage of fibres which adhere only on account of friction, i. e. which are no longer retained with sufficient power, due to the untwisting effected by the draft.

In order that this percentage may not vary (which is a necessary condition in order that the produced yarn may be uniform), it is necessary that the coefficient of friction between the gripped away fibres and the fibres still retained in the roving remains absolutely constant and, therefore, that the untwisting of the roving (upon which this coefficient solely depends) be effected with the greatest uniformity.

Now this uniformity of untwisting is the very thing that cannot be obtained by causing the roving to pass through guiding channels provided with a bottom, of the above-mentioned kind.

Indeed, in order that the roving may get easily and uniformly untwisted or unmatted, it should be allowed a certain amount of expansion.

Now the roving cannot expand if it is caused to pass through channels of the aforesaid type; it is too much enclosed by the side and bottom walls; the substantial and extended friction to which it is submitted at the contact thereof hinders its untwisting and unmatting and makes it irregular, and the irregularities are obviously the more marked inasmuch as, in order to obtain a more condensed yarn, the transversal sectional area of the channel has been more reduced near the drawing rollers.

In order to reduce as much as possible the amount and the duration of this detrimental friction and thus improve the drafting of the roving through a perfect condensation of the latter, in view of obtaining a uniform and smooth yarn, the improvement, according to this invention, is essentially based on the idea of narrowing the roving, by condensing same, and then guiding the roving, thus narrowed, between the usual drawing rollers, very close to the nip thereof, by means of condensing walls acting upon the roving, solely in the direction of its width, while every freedom is left thereto in its vertical plane, this being possible on account of the fact that the bottom or wall connecting the side condensing walls to each other is done away with for that purpose.

In view of this result, the said improvement to the drawing systems of spinning machines, permitting to convert same into high draft systems and to obtain a uniform and smooth yarn, consists, in accordance with this invention, in providing after the intermediate members and directly before the drawing rollers, a condenser characterized in that the side condensing walls or cheeks, are constituted by triangular plane surfaces and mounted, wedge-like, on each side of the roving, at the penetration point of the latter between the drawing rollers, very close to said rollers, though without contacting with them.

The constituent fibres of the roving are pulled in a straight line, in this condenser thus constituted, under the positive action of the drawing rollers; they issue therefrom after being parallelized through drafting and are introduced in this state between said rollers in order to be then collected by the twisting action.

In the annexed drawings:

Fig. 1 is a perspective view of the roving condenser constructed in accordance with the very features of the invention.

Fig. 2 is a side view of said condenser located in front of the drawing rollers, only one of the condensing cheeks being shown.

Fig. 3 is a perspective view of the parts shown in Fig. 2, the top drawing roller being partly broken in order to show more clearly the arrangement of the condenser in front of the drawing rollers.

Fig. 4 is a perspective view showing the way of mounting the condenser according to the invention and

Fig. 5 is a general view of a drawing system improved according to the invention.

According to Figs. 1 to 3, the present condenser consists in the pairing of two cheeks **5**, **6** of triangular shape, one on each side of the roving **7** in course of drafting, said roving coming from the usual feed rollers in the direction on the axis *a*—*a* substantially at right angle to the line *b*—*b* which joins the centers of the lower and top drawing rollers **8** and **9** and passes through the nip thereof.

The cheeks **5**, **6** are mounted, wedge-like, close to the spot where the roving in the course of drafting engages between the drawing rollers and very close to them, but contact between the drawing rollers and with the lower parts **5'** and **6'** and the tips *f* of the cheeks is avoided. These cheeks are inclined away from each other, forming together a dihedral angle, interrupted by a symmetrical straightening of their lower edge **5'** and **6'**, along a straight line *c* drawn from a point *d* (Fig. 1) at a distance *e* from the tip *f* of the cheeks to end at the opposite lower angle *g*, so as to form, in continuation of the hopper-like inclined cheeks **5**, **6** a sort of duct or corridor *h*, between the parallel edges **5'**, **6'**, which effects the condensing of the roving and through which pass necessarily all the fibres which are drawn therefrom by the drawing rollers, the height *e* of said duct, at the exit end, between *d* and *f*, being slightly greater than the diameter of the roving to be drafted.

As just described, all of the fibres drawn by the drawing rollers pass through the duct *h*. Indeed, considering separately the fibres forming the mass of the roving itself, i. e. those fibres which occupy horizontally the zone of a thickness *l* corresponding about to its diameter, and those fibres which are expanded at *k* and *j* above and underneath said zone, it is apparent that, due to the design, the fibres which are drawn by the drawing rollers from the central zone of the roving, all pass necessarily through the duct *h*, whether they pass directly therethrough without being deflected, in case they are located in its vertical plane or are caused to pass therethrough after sliding on the inner surface of the inclined cheeks **5** and **6**.

The lower fibres themselves, expanded at *j*, moving forward along with the roving **7**, enter into the corridor *h* in the same way, i. e. either directly or after sliding on the inner surface of the inclined cheeks, and then, continuing their forward motion, come into engagement with the lower drawing roller **8**, which, due to the friction arising therefrom, stretches them in the direction of the nip or line of contact with the top drawing roller **9**.

With regard to the upper fibres which are fan-like expanded at *k*, as these move forward with the roving, they abut against the upper drawing roll **9**, the friction exerted by the latter causing them to take the direction of the nip of the drawing rollers. In thus deflecting, these fibres meet the edges of the cheeks **5** and **6**, whose inclined profile they follow as they move on while sliding therebetween until they reach the duct *h* in which they penetrate firmly as soon as their points are gripped by the drawing rollers.

The collecting of all the fibres of the roving in the corridor *h* thus forms a homogeneous bundle of well parallelized fibres, the width of which may be adjusted at will, according to the weight of the roving, the nature of the fibrous material and the number or count of the yarn required, by adjusting the distance between the parallel walls of the duct *h*.

If the transversal sectional area of the corridor be expressed by $e \times h$, it will be apparent that, on account of the value *e* being relatively large, a very small value may be taken for the spacing *h* without hindering the passage of the fibres of the roving by a too great reduction of the sectional area.

While thus effecting a very high condensation of the roving, this condensing device hinders only slightly the free untwisting and unmatting of the latter as it may expand nearly on the whole of its periphery. The sole contacts the roving undergoes during its course are those to which it is submitted laterally on its horizontal diameter, with the inclined walls **5**, **6**. The friction resulting therefrom is much too small and, above all, of too short duration to hinder its perfect drafting.

With this device, as the roving may be drafted and condensed in the easiest manner, whatever may be its size and expansion and the various lengths of the fibres of which it is formed, very high rates of drafting may be applied.

In Fig. 4, which shows a manner of constructing and of mounting the condenser according to the invention, it will be apparent that the cheeks **5***a* and **6***a* are stamped in sheet metal and shaped as shown at **5''***a* and **5''***a* and at **5'''***a* and **6'''***a* so as to be secured with the parts **5'''** and **6'''**, by means of rivets **12** or otherwise, on a bar **13**, mounted as the bars of the well known roving transverse-guides used in the drawing systems of spinning machines.

Finally, in Fig. 5, which is a diagrammatic general view of a drawing system in accordance with this invention, **10** indicates the feed rollers, **11** the intermediate or middle rollers and **8** and

9 the drawing rollers effecting the drafting and in front of which the condensing cheeks are arranged, whose tips or noses *f* are located as close as possible to the nipping line of the rollers 8 and 9, though without contacting with them.

Obviously, various modifications, improvements and additions may be effected, and equivalent means may be used, without departing from the spirit of the invention.

I claim:

In combination with the drawing rollers of a spinning machine, a condensing device comprising two spaced side walls or cheeks, each consisting of a plate bent along a line to form two substantially triangular portions having an obtuse angle between them, said plates being supported symmetrically close to the drawing rollers of the spinning machine with one of the triangular portions of each of the plates in parallel

relationship and the other triangular portion of each of the plates in diverging relationship, the apices of the parallel triangular portions being disposed close to the nipping line of the drawing rollers.

JACQUES PHILIPPE LEMAIRE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,230,399	Brandt et al.	Feb. 4, 1941
2,385,448	Kershaw et al.	Sept. 25, 1945

FOREIGN PATENTS

Number	Country	Date
385,739	Great Britain	Jan. 5, 1933