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DOUBLE APRON DRAFTING ARRANGEMENT

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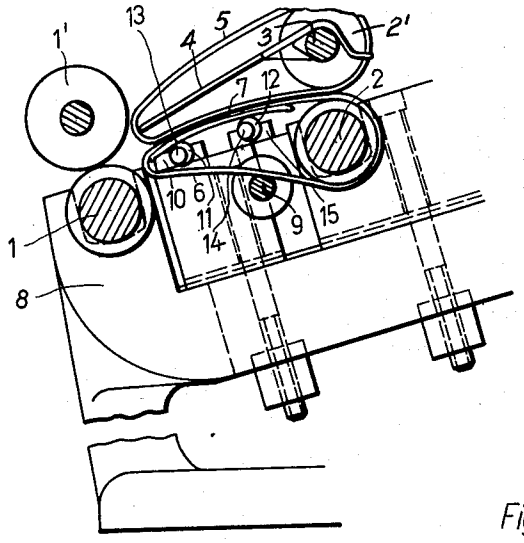

Fig. 1

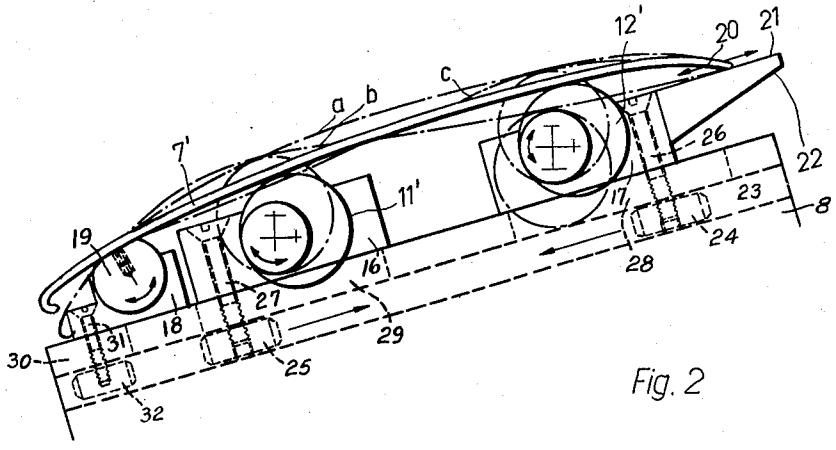

Fig. 2

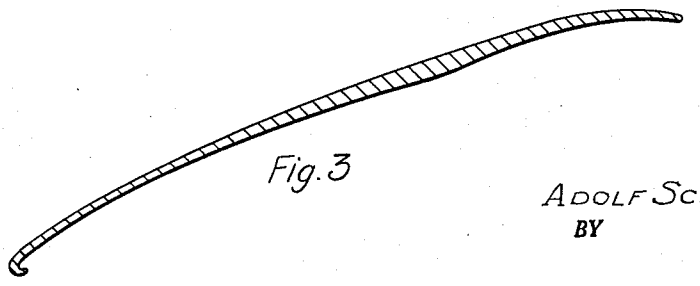

Fig. 3

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DOUBLE APRON DRAFTING ARRANGEMENT

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11 Claims. (Cl. 19—131)

The present invention relates to a double apron drafting arrangement and more particularly to apron support means affording change of the configuration of the apron support for controlling the guide effect of the aprons on the fibres.

Double apron drafting arrangements producing a limited local effect on the guidance of the fibres by variably and locally deflecting the apron have been disclosed, for example, in the German Patent No. 930,918.

The conventional arrangements have the great disadvantage of controlling the guide effect on the fibres and particularly the pressure between the aprons which pressure is chiefly responsible for the guide effect not over the whole guiding zone but only in limited localities thereof.

The apparatus according to the present invention obviates this disadvantage by supporting the lower apron or belt by means of an elastic bridge, the basic shape of which is convex and the curvature of which is adjustable.

It is known that the pressure between two parallel belts, the tension on the belts remaining constant, increases with increasing curvature of the belts. Thus, by suitably varying the elastic line of the elastic bridge, the pressure between the belts can be adapted to a very wide degree to what is desired in each particular case.

The present invention is an important improvement over conventional devices, particularly in the long-fibre field, where the double apron drafting arrangement has practically never been used up to the present day, because it is now possible to regulate the guiding of the fibres more accurately than was possible with the conventional slipping rollers. At places where a relatively more effective guiding of the fibres is required, increased pressure can be provided by increasing the curvature of the aprons, without withdrawing any support from the other regions of the belts.

In order to carry into effect the idea underlying the invention, one or more rotatable eccentrics, disposed immediately under the bridge, are mounted fixedly or so as to be capable of displacement along a support bracket. The bridge is deflected to a greater or less degree by rotating one or two eccentrics. For reliable operation, it is necessary to fix, or at least to support in an articulated manner, one end of the bridge. The free end of the bridge may be supported on a slide plane which is substantially parallel to the support bracket to afford displacement of the free end when the curvature of the bridge is changed. The pressure exerted by the upper apron prevents lifting of the free end of the bridge from the slide surface. The other end of the bridge is preferably rigidly connected to a pin which can oscillate in a support bracket. It may be advisable to fix the pin in a predetermined position so that the elastic line of the bridge can be changed by the application of an additional external force.

The hereindescribed embodiments of the invention are characterized by the provision of one or more devices for changing the configuration of the bridge, all or groups

of the devices being adapted to be adjusted by a single means.

The novel features which are considered characteristic of the invention are set forth with particularly in the appended claims. The invention itself, however, and additional objects and advantages thereof will best be understood from the following description of embodiments thereof when read in connection with the accompanying drawing in which:

Fig. 1 is a diagrammatic side elevation of the main drawing frame of a drafting arrangement, including a bridge for supporting the lower apron;

Fig. 2 is a diagrammatic side elevation of a modified bridge arrangement.

Fig. 3 is a longitudinal sectional view of a bridge member according to the invention.

The portion of a drafting arrangement shown in Fig. 1 includes two pairs of rollers **1,1'** and **2,2'** rotating at different speeds. The upper rollers **1'**, **2'** and a cradle **4** for the upper apron **5**, resting on a top roll axle **3**, are mounted on a conventional arm, not shown, which can be raised upwardly. The aforesaid two roller pairs form the main drawning frame of the drafting arrangement.

The upper apron **5**, in cooperation with a lower apron **6**, guides the spinning material to be drafted, the upper run of the lower apron sliding on an oblong bridge member **7** which is indirectly supported by a bracket **8**. The lower apron **6** can be tensioned by an upwardly acting conventional tensioning device of which only a roller **9** is shown.

The bridge **7** is made of elastic material whose surface, which faces the apron **6**, is preferably covered with an antifriction substance, for example, tetrafluorethylene. The forward end of the bridge is connected with a bearing **10**. The bridge is pressed against eccentrics **11** and **12** by pressure derived from the upper apron **5** whereby the bridge assumes a configuration depending on the relative position of the bearing **10** and the eccentrics **11** and **12**. The latter are mounted on shafts **13** and **14**, respectively, rotatable in bearings **10** and **15**, respectively. Rotation and fixing of the shafts **13** and **14** to obtain and maintain the desired position of the eccentrics is effected by conventional means, not shown, which preferably can be manipulated at the end of the machine. The bearings **10** and **15** are preferably adjustably mounted on the bracket **8** so that their positions can be changed for additionally controlling the configuration of the curvature of the bridge **7** and thereby the pressures acting on the spinning material in different localities.

The embodiment of the invention shown in Fig. 2 differs from that shown in Fig. 1 in that the position of the forward end of a bridge **7'** which end is in the vicinity of the place of reversal of the lower apron, is not fixed but can be changed. In addition to the bearings **16** and **17**, which correspond to the bearings **10** and **15** in Fig. 1, a bearing **18** is provided accommodating a shaft **19**. The latter has a flat surface portion to which the forward portion of the bridge **7'** is fixed, for example, by screws. The bearing **18** is preferably laterally displaceably mounted on the bracket **8**.

The free rear end **20** of the bridge **7'** is longitudinally slidable on a sliding plane **21** which is substantially parallel to the drawing frame. The plane **21** is formed by the upper surface of an arm **22** extending from the bearing **17**. The surface **21** prevents downward swinging of the free end of the bridge too far below the aprons without hindering adjustment of the elastic line of the bridge by means of the eccentrics.

The position of the bearings or supports **16** to **18** can be adjusted along the longitudinal axis of the bridge member. This is accomplished by providing a groove **23**, accommodating nuts **24, 25, 32** in the bracket **8**. Bolts

26, 27 and 31 are screwed into the nuts 24, 25, 32, respectively, and extend through slots 28, 29, 30 into the supports 17, 16 and 18. Upon loosening of the bolts, the respective supports can be moved to the desired positions in which they are fixed by tightening the bolts.

The dash-dot lines in Fig. 2 illustrate elastic lines *a*, *b*, and *c* which are assumed by the bridge, if the eccentrics 11' and 12' are in the positions shown in dash-dot lines. A configuration of the bridge top according to lines *b* or *c*, which have a concave portion following or ahead of a convex portion, is not desired, because at the transition from the convex to the concave portion no pressure is exerted on the fibres.

Desired curvatures of the bridge can also be obtained by varying the thickness of the bridge material at different parts of the bridge. This is shown in Fig. 3.

I claim:

1. A double apron drafting arrangement including an upper and a lower apron having adjacent runs, an oblong flexible and elastic bridge member placed below and being in contact with the run of the lower apron which run is adjacent to the upper apron, and spaced adjustable supports for said bridge member for adjusting the configuration of said bridge member.

2. A double apron drafting arrangement as defined in claim 1 in which said adjustable supports are formed by eccentrics mounted on rotatable shafts whose axes are parallel to said bridge member and transverse to the longitudinal axis of said bridge member.

3. A double apron drafting arrangement as defined in claim 1, including means for changing the position of said supports.

4. A double apron drafting arrangement as defined in claim 1, including means for changing the position of said supports longitudinally of said bridge member.

5. A double apron drafting arrangement as defined in claim 1, including means for changing the spacing of said supports from each other.

6. A double apron drafting arrangement as defined in claim 1, including a support element at one end of said bridge member, said bridge member being made fast on said support element.

7. A double apron drafting arrangement as defined in claim 1, including a movable support element at one end of said bridge member, said bridge member made fast on said support element.

8. A double apron drafting arrangement as defined in claim 1, including a support having a plane support surface, one end of said bridge member slidably resting on said support surface.

9. A double apron drafting arrangement including a pair of superposed feed rollers, a pair of superposed delivery rollers, the rotation axes of said rollers being parallel, an upper apron extending around one of said feed rollers, a lower apron extending around the other of said feed rollers, said aprons having adjacent runs, an elastic bridge member placed below and being in contact with the run of the lower apron which run is adjacent to the upper apron, spaced adjustable supports for said bridge member for adjusting the configuration of said bridge member, and a shaft placed in the vicinity of said delivery rollers and parallel to the rotation axes of said rollers, one end of said bridge member being rigidly connected with said shaft.

10. A double apron drafting arrangement as defined in claim 9, including support means rotatably supporting said shaft.

11. A double apron drafting arrangement according to claim 10 including a member slidably supporting said support means for movement transversely to the rotation axis of said shaft.

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