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F. KÜBLER

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TEXTILE DRAWING MECHANISM

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FIG. 1

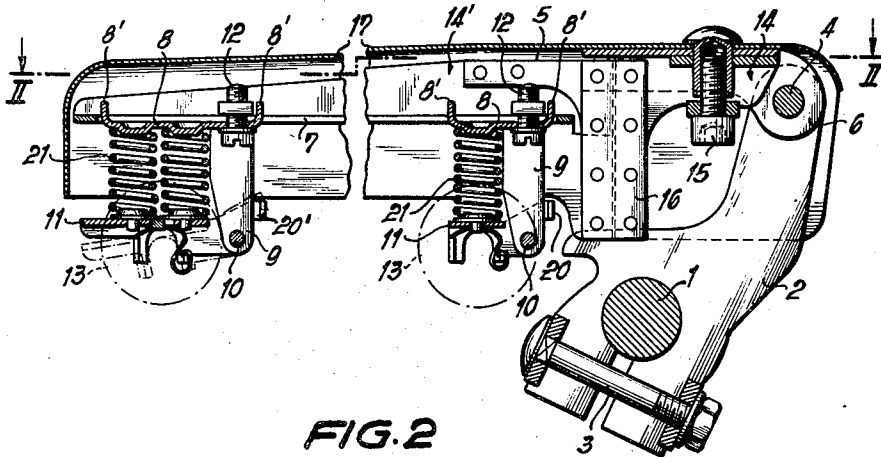


FIG. 2

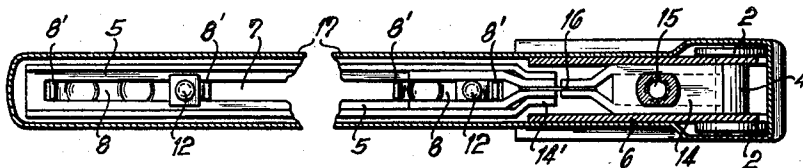
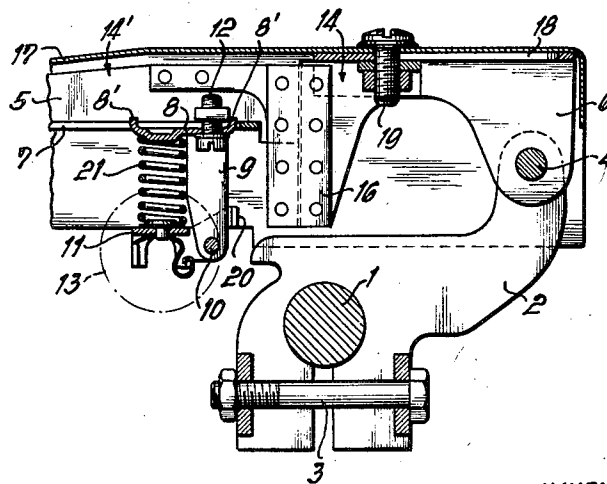


FIG. 3



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TEXTILE DRAWING MECHANISM

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4 Claims. (Cl. 19—135)

This invention relates generally to drawing mechanisms for textile machinery, for example, spinning frames and the like, and, more particularly, is directed toward improvements in drawing mechanisms of the kind wherein twin top rolls, that is, assemblies of two axially aligned top rolls at the opposite ends of a roller shaft, cooperate with lower rolls which are rotatably supported in an underframe of the mechanism, and the twin top rolls are individually suspended from an arm or carrier which is pivoted on a fixed support for movement between operative and inoperative positions, with springs acting between the pivoted arm and the top rolls suspended therefrom to urge the latter toward the related lower rolls, while releasable locking means is provided for retaining the pivoted arm in its operative position against the reactions of the forces of the springs weighting the top rolls.

In drawing mechanism, particularly for spinning frames, it is necessary that the spacing between the nip points formed by the lines of contact between the individual top rolls and the corresponding bottom rolls should be variable either for the purpose of adapting the drawing mechanism for the processing of different fibrous materials, for example, materials having different staple lengths, or in order to obtain a general improvement in the drawing conditions. The weighting or pressures acting on the individual top rolls also determine the quality of the yarn to be produced so that it is frequently necessary to vary such weighting or pressures and also to vary the spacing between the nip points for each drawing mechanism on the complete spinning machine.

Although it is possible with existing drawing mechanisms to effect adjustment of the spacing between the several top rolls, this adjustment has to be carried out with the entire drawing mechanism situated on the spinning or other machine, and it is not possible to simultaneously alter the individual weighting or pressures acting on the top rolls.

In those existing drawing mechanisms where the top rolls are jointly weighted and in which it is possible to vary the pressure acting on the top rolls, the pressures acting on the top rolls are altered when the spacing between the top rolls is changed, so that the possible variation of the pressures acting on the top rolls and changes in the spacing between the top rolls are dependent upon each other. Although drawing mechanisms have been proposed wherein the top rolls are carried by individually weighted saddles and a simple means is provided for adjusting the spacing between the top rolls, it is nevertheless necessary, in such existing mechanisms, to halt the operation of the drawing mechanism on the spinning or other machine in order to vary the pressures acting on the top rolls.

Thus, in all previously existing drawing mechanisms, variations of the spacing between the top rolls and of the weighting or pressures acting on the top rolls have to be carried out with the entire drawing mechanism situated on the spinning or other textile machine. Accordingly, if

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the spacing of the nip points has to be varied on all of the drawing mechanisms of a machine or at one side of the machine, it is necessary to halt the operation of the entire machine, or at least of one side thereof, for a prolonged period, since the adjustment of the top rolls in each drawing mechanism is an involved and time-consuming operation and has to be effected with the utmost care in order to obtain the same conditions for all drawing mechanisms and the production of uniform yarn. Further, it has been found that, even with the exercise of the utmost care, adjustment of the drawing mechanism with the latter situated on the spinning or other textile machine frequently results in faulty or non-uniform setting.

Furthermore, with the known drawing mechanisms, a breakdown or failure occurring in one of the drawing mechanisms of a spinning or other textile machine renders the entire machine, or at least a major portion thereof, inoperative for a lengthy period in the event that the failure cannot be corrected with the drawing mechanism situated on the machine.

Accordingly, it is an object of the present invention to provide a drawing mechanism which permits rapid adjustment of the distance between the nip points of the top and lower rolls and also of the weighting of the individual top rolls, so that operation of the associated spinning or other textile machine needs to be halted for the shortest possible time in order to effect such adjustments.

In accordance with an aspect of this invention, a textile drawing mechanism comprises a fixed support or bracket, a carrier arm including a first component pivotally mounted on the fixed support and a second component releasably secured to the first component in longitudinal alignment with the latter to overlie the drawing field when the carrier arm is disposed in its operative position where it can be releasably locked by a conventional locking means, such second component of the carrier arm having a section which is swingable laterally in a plane parallel to the plane of the drawing field and which carries the twin top rolls and the weighting means acting upon the latter.

With the above arrangement embodying the invention, the second component of the carrier arm which includes the section carrying the twin top rolls and the weighting means therefor can be easily removed from, and connected to, the first component of the carrier arm which is permanently pivotally connected to the fixed support or bracket. Thus, each drawing mechanism can be provided with additional interchangeable removable components of the carrier arm thereof, so that adjustments of the spacing and weighting of the top rolls can be effected on one of the additional removable components of a drawing mechanism, and the latter, following such adjustment, can be installed in place of the previously used removable component. It is apparent that such exchanging of the removable components of a drawing mechanism can be quickly effected, so that the operation of the associated spinning or other textile machine need be halted for only a very short period when it is necessary to adjust the conditions of the drawing mechanism. Since the twin top rolls and the weighting means therefor are carried by a removable component of the carrier arm, the top rolls of several additional removable components for each drawing mechanism may be adjusted to have different predetermined values, so that a removable component of the carrier arm having its top rolls suitably adjusted, as to spacing and weighting, is always available for substitution for the removable component previously on the drawing mechanism, and such adjustment of the spacing and weighting of the top rolls of the removable additional components can be effected in a shop remote from the

textile machine where extreme accuracy in adjustment can be achieved. Further, since a stock of additional removable components having their top rolls suitably adjusted, both as to spacing and weighting, can be maintained, a breakdown or failure in a drawing mechanism on the textile spinning or other machine can be quickly corrected merely by replacing the removable component of the defective drawing mechanism, thereby greatly reducing the period during which the spinning or other textile machine needs to be inoperative as it is no longer necessary to halt the operation of the machine for the protracted period necessary for repairing the defective drawing mechanism.

The provision of a laterally swingable section on the removable component of the carrier arm in a drawing mechanism embodying this invention has the advantage of ensuring the automatically accurate adjustment of all of the top rolls in relation to the corresponding bottom rolls so that the axes of the top and bottom rolls are always parallel. In a preferred embodiment of the invention, such lateral swinging of a section of the removable component is made possible by a frictionless joint, for example, in the form of a thin resilient plate, connecting the swingable section to the remainder of the removable component of the carrier arm.

In accordance with still another aspect of the invention, the removable component of the carrier arm is longitudinally adjustable relative to the component of the carrier arm which is permanently pivoted on the fixed support or bracket, so that longitudinal adjustment of the removable component makes it possible to vary the positions of all of the top rolls relative to the corresponding bottom rolls without requiring displacement of either the usual supporting bar carrying the fixed supports or brackets of the drawing mechanisms or of the bottom rolls of the drawing mechanisms.

Still another feature of the drawing mechanism embodying the present invention is the provision of a protective cover extending over both components of the carrier arm to avoid the accumulation of lint about the carrier arm, such protective cover being secured in position by the same means employed for releasably securing the removable component of the carrier arm to the component of the latter which is permanently pivoted on the fixed support.

In accordance with still another aspect of the invention, the laterally swingable section of the removable component of the carrier arm is formed with a longitudinal extending slot, and a holder for each set of twin top rolls is adjustably and removably received in such slot to permit adjustment of the spacing between the sets of twin top rolls as well as to facilitate the replacement of any worn or defective set of twin top rolls, each set of twin top rolls being mounted in a housing which is pivoted on arms depending from the related holder and which carries a stop engageable with the arms when the carrier arm is released for upward movement from its operative position, thereby to limit the swinging of the housing in the direction moving the related set of twin top rolls away from the carrier arm. Preferably, in accordance with the invention, the stops associated with the several sets of twin top rolls are arranged so that the housing accommodating the set of twin top rolls furthest from the swinging or pivoting axis of the carrier arm, that is, the foremost set of twin top rolls, can swing through an angle greater than the permitted swinging of the other housings. Thus, upon release of the usual locking means retaining the carrier arm in its operative position, for example, during a prolonged inoperative period of the associated spinning or other textile machine, all of the sets of twin top rolls, other than the above mentioned foremost set of twin top rolls, are lifted from the associated bottom rolls, while the foremost twin top rolls continue to rest on the bottom rolls under the relatively low pressure exerted by the weight of the carrier

arm, thereby to prevent the extension of the twist of the already drawn yarn into the drawing field.

The above, and other objects, features and advantages of the invention, will be apparent in the following detailed description of illustrative embodiments thereof which is to be read in connection with the accompanying drawing forming a part hereof, and wherein:

Fig. 1 is a longitudinal sectional view of the carrier arm and associated parts of a drawing mechanism embodying the present invention;

Fig. 2 is a horizontal sectional view taken along the line II—II of Fig. 1; and

Fig. 3 is a fragmentary, longitudinal sectional view, similar to a portion of Fig. 1, but showing another embodiment of the invention.

Referring to the drawings in detail, and initially to Figs. 1 and 2 thereof, it will be seen that a fixed support or bracket 2 is suitably secured, for example, by a clamping bolt 3, to a supporting bar 1 provided on a spinning or other textile machine, and that the fixed support 2 includes side members having upwardly extending portions which carry a pin 4 extending therebetween.

The drawing mechanism embodying this invention includes a carrier arm made up of a first component 6 which is pivotally mounted on the pin 4 and a second component which is generally identified by the reference numeral 5 and is removably secured to the pivotally mounted component 6. A conventional locking device (not shown) may be provided for preventing unintentional upward swinging of the component 6 about pin 4, with carrier arm in the illustrated operative position.

The pivotally mounted component 6 of the carrier arm is formed with a substantially U-shaped, downwardly opening cross-section, and the removable component 5 includes a section 14 which also has a downwardly opening, U-shaped cross-section and which fits longitudinally into the component 6. A suitable securing assembly 15 releasably secures section 14 of the removable component 5 to the pivoted component 6 of the carrier arm. In the embodiment of the invention illustrated in Figs. 1 and 2, such securing means 15 is shown to include a hollow, internally tapped, flat-sided female member extending through correspondingly flat-sided openings in the section 14 and the component 6 to avoid turning of the female component, and a machine screw which passes through an opening of a lateral reinforcement of the section 14 and is threaded into the above described female member.

The removable component 5 of the carrier arm further includes an elongated section 14' having an upwardly opening, U-shaped cross-section and extending longitudinally from the section 14, with the adjacent ends of the sections 14 and 14' being joined together by a frictionless joint which permits lateral swinging of the section 14' relative to the section 14. Preferably, the frictionless joint between the sections 14 and 14' is formed by a thin sheet or plate 16 of flexible or resilient steel which is held between the adjacent ends of the sections 14 and 14' by rivets, screws or the like.

The bottom of section 14' of the removable component of the carrier arm is provided with a central elongated slot 7, and a holder 8 for each set of twin top rolls is slidable along the lower surface of the bottom of section 14' and is formed with upstanding lugs 8' at the opposite ends of the holder projecting slidably into the slot 7 for ensuring parallelism of the axes of the several sets of twin top rolls. Each holder 8 is releasably secured to the section 14' by a screw 12 extending from the holder through the slot 7 and receiving a nut so that, when the nut on the screw 12 is loosened, the related holder 8 may be moved along the section 14' in order to adjust the spacing between the sets of twin top rolls.

Each holder 8 has depending arms 9 which, at their lower ends, carry a pin 10 on which a housing 11 is

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pivotally mounted. Each housing or saddle 11 is intended to accommodate the bearing of a related set of twin top rolls which are represented in broken lines, as at 13 on Fig. 1, and which may be constructed in the manner disclosed in United States Letter Patent No. 2,740,164, issued April 3, 1956, to E. F. Schmid and J. Raible. Each set of twin top rolls 13 is weighted or urged in the direction away from the carrier arm by one or more weighting helical springs 21 interposed between the related holder 8 and saddle-shaped housing 11.

Further, each housing 11 is provided with an integral stop 20 or 20' disposed in back of the related arms 9 and engageable with the latter in order to limit the swinging of the housing by the associated springs 21, that is, in the direction moving the twin top rolls 13 downwardly away from the carrier arm. In accordance with the present invention, the stop 20' of the housing 11 supporting the foremost set of twin top rolls, that is, the set of twin top rolls disposed furthest from the pivoting axis of the carrier arm defined by the pin 4, is disposed so that the related housing 11 can swing through a greater angle, as represented by the broken lines on Fig. 1, than the angular movement of the other housings 11 permitted by the related stops 20. Thus, upon release of the conventional locking device (not shown) associated with the component 6 of the carrier arm, thereby to permit upward movement of the carrier arm from its illustrated operative position, the foremost twin top rolls 13 of the drawing mechanism will continue to rest upon the related bottom rolls (not shown), while the other sets of twin top rolls 13 are lifted from the bottom rolls associated therewith. Accordingly, during prolonged inoperative periods of the associated spinning or other textile machine, all of the twin top rolls, other than the foremost twin top rolls, can be raised from the related bottom rolls, while the foremost set of twin top rolls continues to rest on the related bottom rolls with the relatively light pressure resulting merely from the weight of the carrier arm in order to prevent the extension of the twist of the already drawn yarn into the drawing field.

In order to avoid the accumulation of lint about the carrier arm, the drawing mechanism is further provided with a protective cover 17 which extends around the components 5 and 6 of the carrier arm and which is secured in position by the securing assembly 15 provided for releasably attaching the removable component 5 to the pivoted component 6.

Referring now to Fig. 3, it will be seen that the embodiment of the invention there illustrated is generally similar to that described above with reference to Figs. 1 and 2, and that the several parts thereof are identified by the same reference numerals employed in connection with the description of the corresponding parts of the first described embodiment. The drawing mechanism of Fig. 3 differs from that of Figs. 1 and 2 only in that the removable component 5 of the carrier arm is adjustable longitudinally with respect to the component 6 which is permanently pivoted on the pin 4. In order to permit such longitudinal adjustment of component 5 relative to component 6, the web, or laterally extending portion of the U-shaped component 6 is formed with a longitudinal slot 18, and the securing assembly 19 for removably attaching component 5 to component 6 includes a screw passing through the protective cover 17, the slot 18 and an opening in a cross-bracing member of the section 14 of component 5, and a nut threaded on such screw below the cross-bracing member of section 14. Thus, when the securing assembly 19 is loosened, the component 5 of the carrier arm can be adjusted longitudinally relative to the component 6 thereby to vary the positional relationship of all of the sets of twin top rolls 13 suspended from the component 5 relative to the associated bottom rolls (not shown), without requiring displacement either of the supporting rod 1 or of the individual bottom rolls.

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It is apparent that, with each of the above described embodiments of the invention, when a change is to be effected in the spacing of the twin top rolls 13 or in the weighting thereof, or in both the spacing and weighting of the top rolls, the component 5 of the carrier arm may be easily removed, merely by releasing the securing assembly 15 or 19, and the removable component 5 can then be replaced by another similar component having its top rolls previously set with the desired spacing and weighting. Thus, the spacing and weighting of the top rolls can be adjusted at a location remote from the spinning or other textile machine in order to ensure accuracy in effecting the necessary adjustments, and in order to avoid a lengthy period of inoperativeness of the spinning machine during changes in the conditions of the drawing mechanisms thereof. Further, by reason of the removable component 5 of the carrier arm, a breakdown or failure in the drawing mechanism can be quickly and easily corrected merely by replacing such removable component of the carrier arm with a new component having properly functioning top rolls suspended therefrom.

When it is desired to alter or adjust the spacing between the sets of twin top rolls 13, it is only necessary to loosen the securing means 12 and to move the holders 8 along the slot 7 to the desired new positions, whereupon the securing means 12 can be again tightened. In order to facilitate the adjustment of the spacing between the top rolls, suitable markings may be provided along the edges of the slot 7 for indicating the spacing between the related top rolls. Adjustment of the weighting of the sets of twin top rolls can be effected merely by replacing the weighting springs 21 or by inserting suitable shims between the springs and either the related holder 8 or housing 11. Since the component 5 of the carrier arm is removable, such replacement of the weighting springs 21 or insertion of shims for varying the forces exerted thereby can be effected at a location remote from the spinning or other machine, thereby to greatly facilitate the adjustment of the weighting forces.

Although illustrative embodiments of the invention have been described in detail herein with reference to the accompanying drawing, it is to be understood that the invention is not limited to such precise embodiments, and that various changes and modifications may be effected therein without departing from the scope or spirit of the invention, except as defined in the appended claims.

What is claimed is:

1. A textile drawing mechanism comprising a fixed support, a carrier arm including first and second components and means releasably securing said components to each other in longitudinally aligned relationship, means pivotally mounting said first component of the carrier arm on said fixed support so that the carrier arm can swing between an operative position, where said second component overlies a drawing field, and a raised inoperative position, said second component having a section of substantial length, a frictionless joint connecting said section to the remainder of the second component to permit free lateral swinging of said section, sets of twin top rolls, means suspending said sets of twin top rolls from said section of the second component of said carrier arm, and means weighting said top rolls.

2. A textile drawing mechanism as in claim 1; wherein said frictionless joint includes a thin flexible plate, and means joining said plate to said section and to said remainder of the second component, respectively.

3. A textile drawing mechanism as in claim 1; wherein said laterally swingable section of the second component has a longitudinally extending slot therein, and said means suspending said sets of twin top rolls includes a holder for each of the sets of twin top rolls, and releasable means for each holder extending through said slot of said section to detachably secure the related holder to

said section while permitting movement of the related holder along said section for adjusting the spacing between the sets of twin top rolls.

4. A textile drawing mechanism as in claim 3; wherein said means suspending said sets of twin top rolls further includes arms depending from each holder, a housing for each set of twin top rolls pivotally mounted on said arms depending from the related holder to swing about an axis parallel to the swinging axis of said carrier arm and stop means on said housing engageable with said arms of the related holder to limit the swinging of said housing in the direction moving the related set of twin top rolls away from the carrier arm under the influence of said weighting means, said stop means of the housing for the set of twin top rolls disposed furthest 15

from said swinging axis of the carrier arm being disposed to permit swinging of the related housing in said direction to an angular extent which is substantially greater than the permitted swinging of the housings for the other sets of twin top rolls.

References Cited in the file of this patent

UNITED STATES PATENTS

10	2,644,988	Haythornthwaite et al. --	July 14, 1953
	2,675,587	Raible et al. -----	Apr. 20, 1954
	2,834,995	Calvert et al. -----	May 20, 1958
	2,834,996	Rulon-Miller et al. -----	May 20, 1958
	2,850,770	Noguera -----	Sept. 9, 1958