Dec. 28, 1965 K. H. BREITENBACH ETAL 3,225,392

DRAWING MECHANISM FOR A SPINNING MACHINE

Filed May 22, 1962 5 Sheets-Sheet 1

Fig. 1

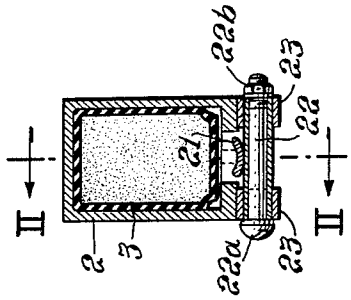
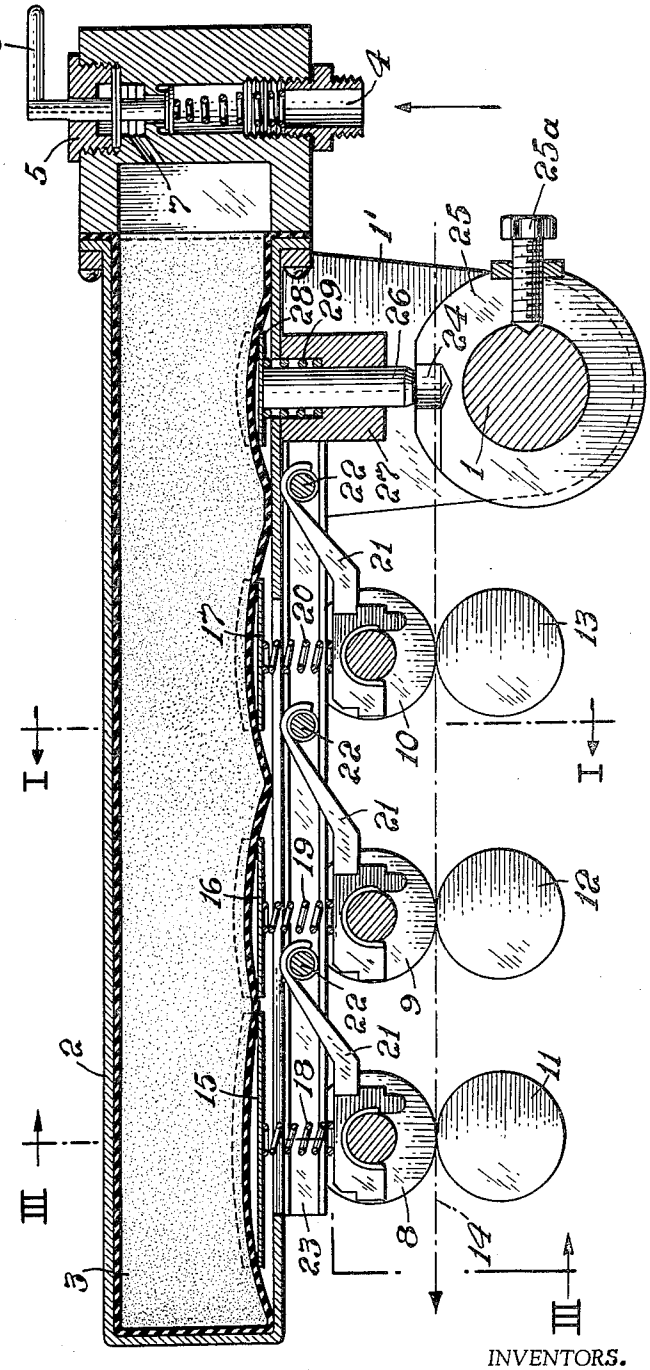


Fig. 2



INVENTORS.
Karl-Heinz Breitenbach
BY Friedrich Kübler
Richard Thrun Agt

DRAWING MECHANISM FOR A SPINNING MACHINE

Filed May 22, 1962 5 Sheets-Sheet 2

Fig. 3

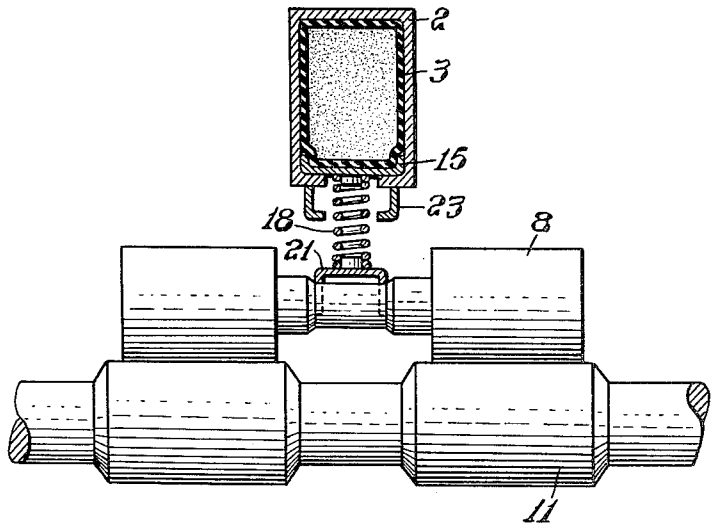
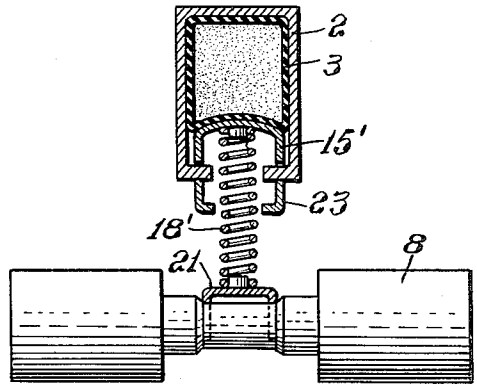


Fig. 4



INVENTORS.
Karl-Heinz Breitenbach
BY Friedrich Kübler
Richard Lundgren

Dec. 28, 1965 K. H. BREITENBACH ETAL 3,225,392

DRAWING MECHANISM FOR A SPINNING MACHINE

Filed May 22, 1962 5 Sheets-Sheet 3

Fig. 5

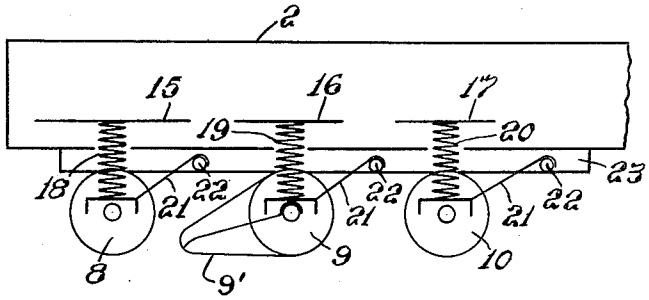


Fig. 6

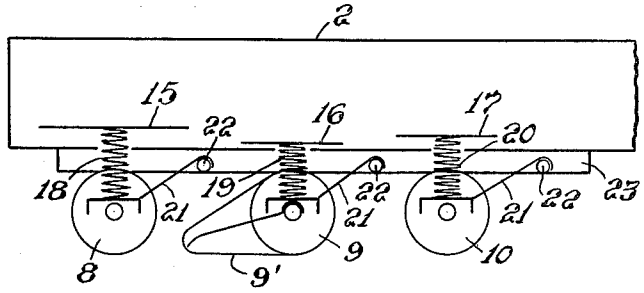


Fig. 7

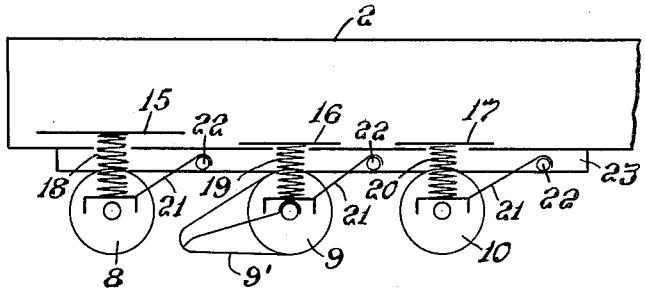
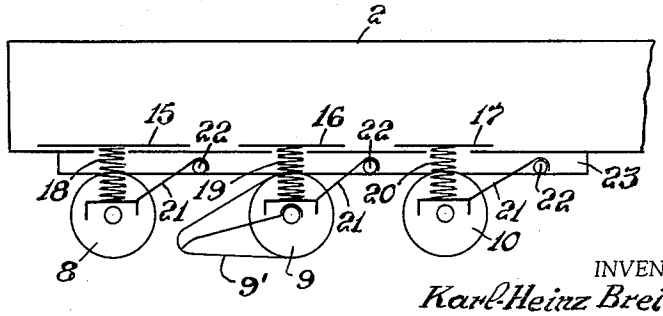


Fig. 8



INVENTORS.
Karl-Heinz Breitenbach
BY Friedrich Kübler
Richard Conrad Agt

Dec. 28, 1965 K. H. BREITENBACH ETAL 3,225,392

DRAWING MECHANISM FOR A SPINNING MACHINE

Filed May 22, 1962 5 Sheets-Sheet 4

Fig. 9

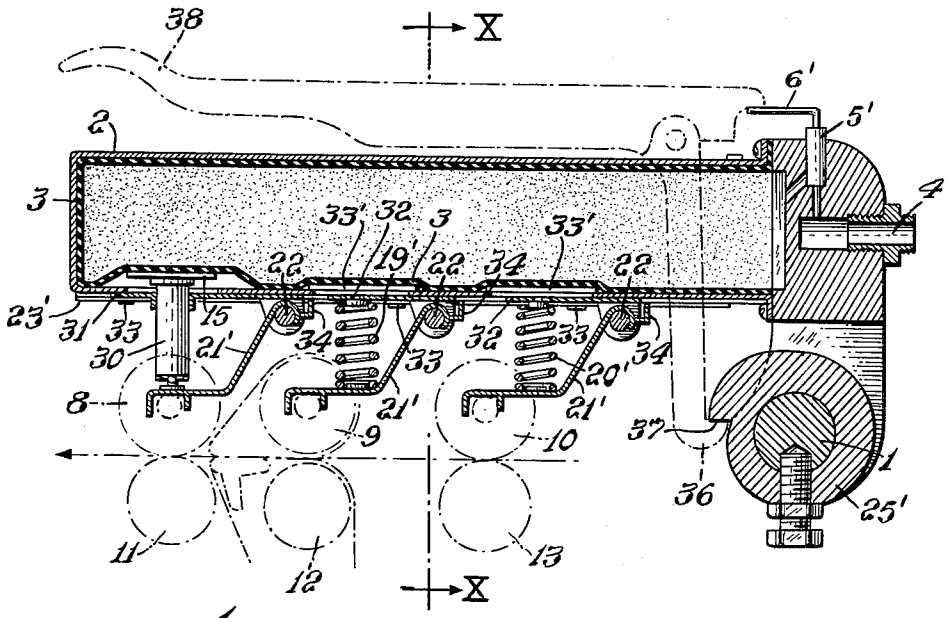


Fig. 10

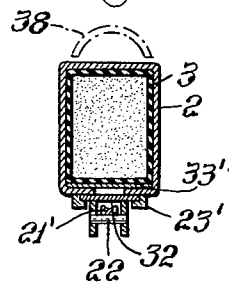


Fig. 11

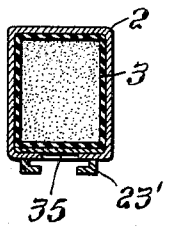
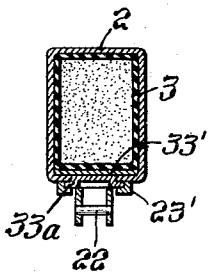


Fig. 12



INVENTORS.
Karl-Heinz Breitenbach
BY Friedrich Kübler
Richard Lucas Agt

Dec. 28, 1965 K. H. BREITENBACH ETAL 3,225,392

DRAWING MECHANISM FOR A SPINNING MACHINE

Filed May 22, 1962 5 Sheets-Sheet 5

Fig. 13

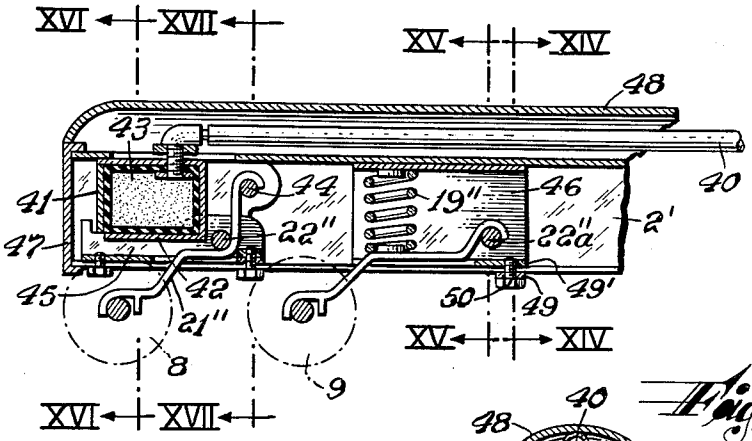


Fig. 14

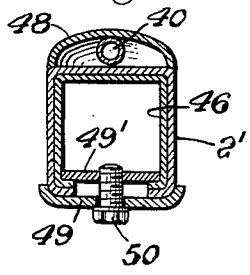


Fig. 15

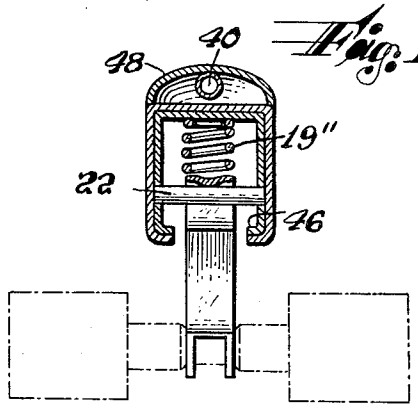


Fig. 16

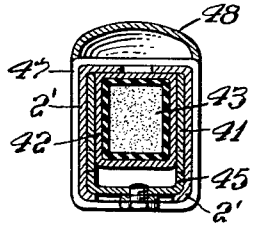
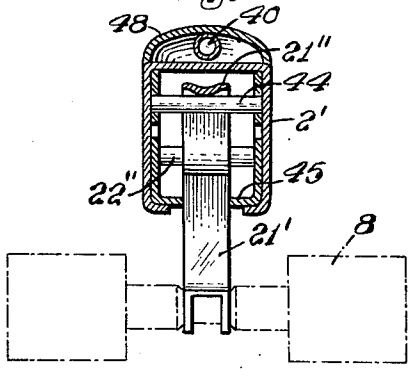


Fig. 17



INVENTORS.
Karl-Heinz Breitenbach
BY Friedrich Kübler
Richard Good Agt

United States Patent Office 3,225,392 Patented Dec. 28, 1965

3,225,392
DRAWING MECHANISM FOR A SPINNING MACHINE

Karl Heinz Breitenbach and Friedrich Kübler, both of Stuttgart-Bad Cannstatt, Germany, assignors to Skf Kugellagerfabriken Gesellschaft mit beschrankter Haftung, Stuttgart-Bad Cannstatt, Germany, a company of Germany

Filed May 22, 1962, Ser. No. 197,560
9 Claims. (Cl. 19—267)

This invention relates to drawing mechanisms for spinning machines and the like, and is more particularly concerned with control of the pressure exerted by top rollers of the mechanism on the bottom rollers, and on the fibrous material which is being drawn between the top and bottom rollers.

In its more specific aspects, this invention is concerned with the type of drawing mechanism in which several top rollers are supported on a common carrier arm. The arm may be pivoted toward and away from an operative position in which the top rollers cooperate in a drawing area with bottom rollers rotatable about fixed axes. The pressure exerted by the top rollers on the sliver which passes through the drawing area between the rollers may be provided in known drawing mechanisms by individual springs associated with each roller or pair of rollers rotating about a common axis. The roller pressure may be varied by adjusting the spring tension, or by replacing the springs. Neither the adjustment nor the replacement can be performed conveniently. The downtime involved in an exchange of springs or in the individual adjustment of their tension on a spinning machine having a large number of top rollers makes it mandatory to avoid adjustments in the top roller pressure whenever possible.

In order to reduce the time required for changing the pressure of the top rollers, drawing mechanisms have been proposed in which the top rollers are acted upon by fluid pressure operated devices, so that pressure of all rollers in a frame may be adjusted by varying the fluid pressure at a central source. It is impossible with the known fluid operated mechanism to vary the pressure of one set of rollers within each drafting mechanism relative to the other sets as would be desirable when changing from spinning one fibrous material to spinning another material.

The general object of the invention is the provision of improved pressure controls for drawing mechanism on spinning machines.

An important object is the provision of controls which permit varying the top roller pressure during operation of the spinning machine.

Another object is a drawing mechanism in which the pressure of all rollers or the pressure of selected rollers may be varied as conditions may require.

With these and other objects in view, the invention in one of its aspects provides fluid operated pressure means for one roller or set of rollers in a drawing mechanism, and solid mechanical pressure means for another roller or set of rollers, each set consisting of two or more rollers connected for joint rotation about a common axis in the usual manner. The operating fluid for the first mentioned pressure means may be a gas under pressure, such as compressed air, or a liquid such as oil or other hydraulic fluid under a pressure greater than atmospheric pressure. The term solid mechanical pressure means will be employed hereinafter to designate a mechanical pressure system all essential operating elements of which are solid bodies. Examples of solid mechanical pressure means include springs and weights, but the term is not necessary limited to such examples.

As will become better understood as the disclosure proceeds, the drawing mechanism of the invention permits to maintain a predetermined relationship between the pressures exerted by the several individual rollers or sets of rollers which cooperate in drawing a sliver, and also permits the pressure of a selected top roller to rise to a maximum value without simultaneously increasing the pressure exerted by the cooperating rollers.

The exact nature of this invention as well as other objects and advantages thereof will be readily apparent from consideration of the following specification relating to the annexed drawings in which:

FIG. 1 shows the elongated carrier arm of a drawing mechanism of the invention in transverse section on the line I—I in FIG. 2;

FIG. 2 is a longitudinally sectional view of the arm of FIG. 1 taken on the line II—II and including other elements of the drawing mechanism omitted in FIG. 1;

FIG. 3 shows the apparatus of FIG. 2 partly in front elevation and partly in section on the line III—III;

FIG. 4 shows a modified drawing mechanism of the invention in a view corresponding to that of FIG. 3;

FIGS. 5 to 8 are explanatory of the operation of an apparatus very similar to that shown in FIG. 2;

FIG. 9 illustrates another embodiment of the invention in a view corresponding to that of FIG. 2;

FIG. 10 shows the carrier arm of the device of FIG. 9 in section on the line X—X;

FIGS. 11 and 12 are views of modified carrier arms of the invention in transverse section analogous to FIG. 10;

FIG. 13 illustrates yet another embodiment of the invention in a longitudinally sectional view corresponding to that of FIG. 2;

FIGS. 14 to 17 show the apparatus of FIG. 13 in transverse section on the lines XIV—XIV, XV—XV, XVI—XVI, and XVII—XVII respectively.

Referring now to the drawing in detail, and initially to FIGS. 1, 2, and 3, the stationary supporting frame of a spinning machine is represented only by a cylindrical bar 1 on which an elongated carrier arm 2 is pivotally mounted by means of a bracket 1'. The arm 2 is hollow and of rectangular cross section. A membrane 3 of resilient material forms a container within the cavity of the arm 2. A pressure line 4 connected to a source of pressure fluid communicates with the interior of the container 3 through a rotary three-way valve 5 on the arm 2 and a passage 7 connecting the valve with the inner cavity of the arm 2.

A handle 6 permits the valve 5 to be set in two positions in which the passage 7 communicates with the pressure line 4 and the ambient atmosphere respectively. The pressure fluid admitted through the valve 5 to the container 3 may be either a compressed gas such as air, or a liquid under pressure. The nature of the fluid will control the choice of the material of the resilient membrane 3. Admission and release of fluid from the container 3 by the valve 5 permits control of the fluid pressure therein.

The arm 3 carries three pairs of top rollers 8, 9, 10 mounted on respective common integral shafts. Each top roller cooperates with a corresponding bottom roller 11, 12, 13 in a drawing area which is defined substantially by the common tangents of the cooperating top and bottom rollers. The apron associated with the roller 9 in a conventional manner and the structure supporting the apron have been omitted from the showing of FIG. 2 for the sake of clarity. A sliver 14 is seen in FIG. 2 to pass through the drawing area.

The rollers 8, 9, 10 are mounted on the underside of the arm 2 in a longitudinally spaced relationship. The

bottom of the arm 2 is longitudinally slotted above the rollers 8, 9, 10, and the slot is largely covered from above by three contact plates 15, 16, 17 respectively associated with the top rollers. The plates are interposed between the bottom of the arm 2 and the membrane 3 and are all or partly of different size, the contact plate 15 associated with the front roller 8 being shown to be larger, the plate 17 associated with the drawing-in roller 10 being shown to be smaller and approximately as large as the plate 16 associated with the middle roller.

Each top roller is journaled on one end of a guide arm 21 the other end of which is hooked over a shaft 22. Each roller thus may pivot on the arm 2 in a circle centered on the respective shaft 22. Helical compression springs 18, 19, 20 are respectively fastened to the contact plates 15, 16, 17 and resiliently urge the ends of the arms 21 with the top rollers supported thereon toward the drawing area in the normal operating position of the apparatus.

Two rails 23 depend from the two longitudinal bottom edges of the arm 2. The several shafts 22 are screwed to the rails 23 but are longitudinally adjustable within slots therein (not shown). The shafts each have a head 22*a* at one end and are threadedly engaged by a nut 22*b* at the other end. The head 22*a* and the nut 22*b* abut from the outside against the rails 23, and thereby releasably secure the position of the respective shaft 22.

A locking ring 25 is mounted on the bar 1, and its position on the bar may be fixed by a set screw 25*a*. A locking pin 26 is vertically slidable on the arm 2 in a tubular guide member 27. One end of the pin 26 carries a contact plate 28 smaller than the plate 17, and is urged to move inward of the container 3 by a helical compression spring 29 which abuts against the underside of the plate 28. The other end of the pin 26 is aligned with a radial recess 24 in the locking ring 25.

As shown in FIG. 3, the contact plate 15 has the cross sectional shape of a very shallow trough in which a wall of the container 3 is received. The cross section of the plates 16, 17, 28 is the same as that of the plate 15. When fluid pressure expands the container 3, the wall in contact with the plates 15, 16, 17, 28 moves in a direction outward of the container and compresses the associated springs 18, 19, 20, 29 until the contact plate abuts against the bottom wall of the arm 2.

A modified bottom plate 15′ which requires a somewhat longer helical spring 18′ under otherwise identical conditions is shown in FIG. 4. The plate 15′ forms an inverted trough with an outwardly convex bottom against which the movable wall of the container 3 abuts. The apparatus illustrated does not otherwise differ from that shown in FIG. 3 and will be preferred where longer springs are desired than could be accommodated between the contact plates 15, 16, 17 and the respective guide arms 21.

The mode of operation of the apparatus illustrated in FIGS. 1 to 3 is illustrated in FIGS. 5 to 8 in a diagrammatic manner. The arm 2 is locked by engagement of the pin 26 with the recess 24 when pressure of fluid in the container 3 moves the contact plate 28 outward of the arm 2 against the restraint of the relatively weak spring 29. Such locking thus takes place at relatively low fluid pressure within the container 3.

The positions of the rollers 8, 9, 10 remain substantially the same in all operative positions of the drawing apparatus. Downward movement of the rollers is prevented by abutment against the bottom rollers not seen in FIGS. 5 to 8. Upward movement is prevented by the springs 18, 19, 20 which are backed by the pressure of fluid in the container 3. In the position illustrated in FIG. 5, this pressure is insufficient to overcome the force of any one of the springs.

As pressure in the container 3 is increased by suitable admission of fluid through the valve 5, the springs are compressed to a different extent depending on their characteristics which are different, and on the forces applied which also differ in view of the different sizes of the contact plates 15, 16, 17. In the illustrative example represented in FIGS. 5 to 8, the combination of spring characteristics and applied force is such that the spring 19 associated with the middle roller 9 is most rapidly compressed so that its contact plate 16 is made to abut first against the bottom wall of the arm 2 as shown in FIG. 6. The pressure exerted on the middle roller 9 has reached a maximum and will not further increase with the fluid pressure in the container 3. In the condition shown in FIG. 6, the roller 9 is only under the influence of the compressed spring 19.

FIGS. 5 to 8 show roller 9 to be equipped with the apron 9′ of leather tape omitted from FIG. 2. The limitation of the pressure of the middle roller 9 to a relatively low maximum value provides a significantly increased useful life for the apron 9′.

As the pressure of the fluid in the container 3 is further increased, the condition illustrated in FIG. 7 is reached, in which the plate 17 of the drawing-in roller 10 abuts against the inner bottom wall of the arm 2, whereas the plate 15 is still spaced from the bottom wall, and permits a further pressure increase on the front roller 8 before it abuts against the bottom wall, as shown in FIG. 8.

A wide range of operating conditions is available for each combination of spring characteristics and sizes of contact plates by merely varying the fluid pressure within the container 3. Under practical operating conditions, all different pressure distributions that a drawing mechanism will be normally called upon to provide can be had without changing springs or contact plates.

In the condition of the mechanism illustrated in FIG. 5, the pressure exerted by the top rollers 8, 9, 10 is determined almost exclusively by the resilience of the fluid filled container 3. In the condition illustrated in FIG. 6, this mode of operation still is valid for the rollers 8 and 10, but the pressure exerted by the middle roller 9 is determined by the characteristics of the spring 19 as if it were fixedly fastened to the arm 2. In the condition illustrated in FIG. 7, only front roller 8 is urged away from the carrier arm 2 toward the drawing area by fluid operated pressure means, whereas the response of both the middle roller 9 and the drawing-in roller 10 to the passage of a sliver is determined solely by solid mechanical means represented by their respective springs 19 and 20.

Release of fluid pressure from the container 3 causes withdrawal of the pin 26 from the recess 24 and permits the arm 2 to be pivoted away from the drawing area for inspection or repair.

Many, or at least some of the advantages of the apparatus illustrated in FIGS. 1 to 3 are still available when the dual means for urging each top roller toward the drawing area are partly replaced by single means, either fluid operated or solid mechanical, as long as the apparatus permits a mode of operation wherein two top rollers are respectively acted upon by fluid operated pressure means and by solid mechanical pressure means.

In the embodiment of the invention illustrated in FIG. 9 and the transversely sectional view of FIG. 10, an arm 2 substantially identical with the arm shown in FIGS. 1 to 3 is lined with a membrane 3 which forms a container for a pressure fluid admitted through a three-way valve 5′. The valve 5′ is a slide valve and is arranged to admit fluid to the container 3 or to release fluid therefrom to the ambient atmosphere.

The three top rollers 8, 9, 10 are pivotally mounted on the underside of the carrier arm 2 by means of respective guide arms 21′. The front roller 8 is urged away from the carrier arm by a rigid rod 30 which passes through an opening in the bottom wall of the carrier arm 2 and is attached to the contact plate 15. The plate is arranged between a movable wall portion of the container 3 and the bottom wall of the carrier arm, and

the pressure transmitted by it to the front roller 8 is readily controlled even during operation of the spinning machine by controlling the fluid pressure in the container 3 by means of the slide valve 5'. The rollers 9 and 10 are under the pressure of respective springs 19' and 20' which are interposed between the bottom of the carrier arm 2 and that end portion of the respective guide arms 21' on which the rollers 9, 10 are journaled.

Each roller 8, 9, 10 together with its guide arm and pressure means constitutes a top roller unit that may be installed or removed as a complete structure. The several units illustrated in FIG. 9 may be interchanged.

Longitudinal guide rails 23' on the underside of the carrier arm 2 accommodate slidable base plates 31, 32 on which the units are respectively supported. Each base plate is equipped with a set screw 33 by means of which its desired position along the rails 23' may be fixed. The base plate 31 is formed with an opening conforming to the rigid rod 30, and the two plates 32 of substantially identical shape and size are each equipped with an attachment for a respective spring 19', 20', and likewise apertured to permit, if need be, the rod 30 to pass through the aperture in one of the plates 32. Registering with the apertures in the plates 32 are openings in the bottom wall of the arm 2. Depending integral lugs on the base plates 31, 32 receive the shafts 22 on which the guide arms 21' are pivoted. The pivot ends of the guide arms 21' carry respective abutments 34 which limit rotary movement of the guide arms under the urging of their respective pressure means by engagement with the corresponding base plate 31, 32, as seen in FIG. 9.

For the two spring loaded units of the top rollers 9 and 10, suitable plates 33' of the type better seen in FIG. 10 are inserted between the respective portions of the bottom walls of the container 3 and the carrier arm 2. the bottom walls of the container 3 and the carrier arm 2 to cover the opening provided for passage of the rigid bar 30. The plates 33' are brought in place either through the openings in the bottom wall of the carrier arm or before the assembly of the drawing mechanism by being slid from an open end of the arm 2 between the bottom walls of the arm and the container 3. The pressure of the fluid in the container 3 may be adequate to hold the plates 33' in their proper position.

When a third spring loaded top roller unit is desired to be employed with the front roller, a unit identical with those assembled on base plates 32 in FIG. 9 may be used. The opening for passage of the bar 30, upon withdrawal of the bar 30 and contact plate 15, may be covered by a releasable bottom plate 35 as shown in FIG. 11. The plate 35 is similar to or identical with one of the plates 33'.

In FIG. 12, a plate 32*a* is shown which has a raised center portion that enters an opening in the bottom wall of the carrier arm 2. Such plate remains more safely positioned than the plates 32.

The carrier arm 2 shown in FIG. 9 is secured in its operative position adjacent the drawing area by a hook shaped latch member 36 which engages a radial face 37 of a locking ring 25' mounted on the bar 1. The latch member 36 is pivotally suspended from an actuating lever 38 which is hingedly attached to the arm 2 in a manner not further illustrated. When the forward arm of the lever 38 is lifted, the other arm lowers the latch member 36 and thereby disengages it from the radial face 37 of the locking ring 25'. It also depresses the handle 6' of the valve 5' so that the valve is moved from the position illustrated in which it connects the container 3 to the pressure line 4, to its other position in which it vents the container 3 to the atmosphere. Such slide valves being well known in themselves, the bores and ducts of the valve have not been shown in detail.

When the carrier arm 2 is again to be locked in its operative position seen in FIG. 9, the front end of the lever 38 is depressed until the latch member 36 can be engaged with the face 37 of the locking ring 25'. The valve handle 6' is simultaneously returned to the position shown in FIG. 9 to admit pressure fluid to the container 3. The latch member 36, radial face 37, and actuating lever or actuating member 38 are conjointly referred to in the claims as locking means, and the latch member 36 and radial face 37 are jointly and specifically referred to as locking means proper.

FIG. 13 shows yet another embodiment of the invention in which a carrier arm 2' is equipped to receive interchangeable top roller units. Only the front roller unit and a middle roller unit are seen in FIG. 13, but it will be understood that the arm 2' may carry a drawing-in unit identical with the illustrated middle roller unit. The carrier arm 2' is hollow and its bottom has a wide longitudinal slot leaving only enough of the bottom wall to constitute narrow ledges on either side of the slot.

The front roller 8 is part of a top roller unit which is assembled on a base member 45 the shape of which is best seen in the sectional view of FIG. 16. The base member 45 is a channel whose web is supported on the bottom wall ledges of the carrier arm 2'. A casing 42 of rectangularly prismatic shape is fastened on the base member 45 within the carrier arm 2. The casing 42 has an open front end and otherwise encloses a container 43 of resiliently yieldable material of the type employed in the aformentioned container 3. A movable motion transmitting member 41 normally closes the open front of the casing 42. The member 41 is a piece of sheet metal bent along two parallel lines. The central portion between the bends is placed before the open front end of the casing 42. The two free end portions extend rearwardly along and beyond the longitudinal vertical walls of the casing 42. The parts of the motion transmitting member 41 which project rearward of the casing 42 are connected by a transverse pin 44 over which an end portion of a guiding arm 21'' is hooked. The arm 21'' is pivoted on a shaft 22'' which connects the two flanges of the base member 45. The free longitudinal edges of these flanges constitute guide rails on which the motion transmitting member 41 may move forward from the position illustrated in FIG. 13 until it abuts against a vertical projection on the base member 45.

The open front end of the carrier arm 2' is closed by a front cover 47 which is releasably fastened to the arm 2' in a manner not further illustrated. The base member 45 is releasably bolted to the arm 2' so that the entire front top roller assembly may be removed as a unit after release of the cover 47.

Pressure fluid is supplied to the container 43 by a tube 40 connected to a fluid source through a valve in the same manner as illustrated in FIGS. 2 and 9 with respect to the container 3. The roof of the arm 2' is provided with a longitudinal slot (not shown) so that if a single pressure fluid operated top roller unit is present, such unit may be moved lengthwise together with the free end of the tube 40 and joint means between the tube 40 and the container 43. If several pressure fluid operated top roller units are mounted on the arm 2', each is preferably equipped with its own pressure fluid tube 40 and an individual valve.

The middle roller 9 is part of a top roller assembly which is mounted on a base member 46. As best seen from FIGS. 14 and 15, the base member 46 is of a cross sectional shape similar to that of the carrier arm 2'. It is dimensioned to conform to the interior of the arm 2', and to be longitudinally slidable therein. A wide slot in the bottom face of the tubular base member 46 registers with the slot in the bottom wall of the arm 2'.

A shaft 22*a*'' extending transversely between the side walls of the base member 46 pivotally supports one end of a guide arm on the other end of which the roller 9 is journaled. A helical spring 19'' is interposed between

the end of the guide arm near the roller **9** and the top of the base member **46**.

The top roller unit of the roller **9** is secured in its position in the arm **2'** by two fastening plates **49**, **49'** best seen in FIG. **14**. The plates **49** and **49'** are centrally connected by a screw **50** the conventional slotted head of which is accessible outside the arm **2'**. The screw **50** passes freely through the plate **49** which is placed on the underside of the bottom wall of the arm **2'**. The other plate **49'** is threadedly engaged by the screw **50** within the arm **2'** and exerts downward pressure on the ledge portions of the base member **46** adjacent the slot in the bottom face of the member **46**, thereby securing the base member to the arm **2'**.

The pressure fluid tube **40** is placed on top of the arm **2'** and outside the walls of the arm **2'** proper. It is protected by an elongated cover **48** of arcuate cross section. If so desired, the cover may be hinged to the arm **2'** and serve as an actuating lever for releasing a latch member and actuating a valve in the manner of the lever **38** shown in FIG. **9**.

It should be understood, of course, that the foregoing disclosure relates to only preferred embodiments of the invention and that it is intended to cover all changes and modifications of the examples of the invention herein chosen for the purpose of the disclosure which do not constitute departures from the spirit and scope of the invention set forth in the appended claims.

What is claimed is:

1. In a drawing mechanism for a spinning machine and the like,

(a) a stationary support,

(b) a carrier arm pivotable on said support toward and away from an operative position spacedly adjacent a drawing area,

(c) a plurality of top rollers movably mounted on said arm for cooperation with corresponding bottom roller means in said drawing area when said arm is in said operative position,

(d) membrane pressure means disposed on said arm for urging one of said top rollers to move away from said arm in a direction toward said drawing area when said arm is in said operative position,

(e) a source of pressure fluid operatively connected with said membrane pressure means,

(f) solid mechanical pressure means operatively interposed between said arm and another top roller for independently urging said other top roller to move away from said arm in a direction toward said drawing area, said membrane pressure means and said solid mechanical pressure means forming together with the respective top roller interchangeable units,

(g) rail means on said arm for slidably receiving said units for said cooperation of top rollers with corresponding bottom rollers, and

(h) means for releasably and interchangeably securing each of said units along said rail means.

2. In the mechanism according to claim **1**, control means connected to said membrane pressure means for controlling the pressure of said pressure fluid.

3. In a mechanism as set forth in claim **1**, rigid motion transmitting means interposed between said membrane pressure means and said one top roller.

4. In a drawing mechanism for a spinning machine and the like, in combination:

(a) a stationary support;

(b) a carrier arm pivotable on said support toward and away from an operative position spacedly adjacent a drawing area, said arm having a bottom;

(c) a plurality of top rollers movably mounted on said arm for cooperation with corresponding bottom roller means in said drawing area when said arm is in said operative position;

(d) a container mounted on said arm and having a membrane like wall;

(e) a source of fluid under pressure communicating with said container for urging said wall to move outwardly of said container;

(f) motion transmitting means operatively interposed between said wall and one of said top rollers for urging same to move away from said arm in a direction toward said drawing area under the pressure of said fluid when said arm is in said operative position;

(g) solid mechanical pressure means operatively interposed between said arm and another top roller for urging said other top roller to move away from said arm in a direction toward said drawing area, said motion transmitting means and said solid mechanical pressure means forming together with said one and said other top roller, respectively, interchangeable units;

(h) rail means on said arm bottom for slidably receiving said units; and

(i) means for releasably and interchangeably securing each of said units along said rail means.

5. In a mechanism as set forth in claim **4**, said motion transmitting means being substantially rigid.

6. In a mechanism as set forth in claim **4**, said arm being hollow and enclosing said container, and being formed with openings for selective passage of said motion transmitting means.

7. In a mechanism as set forth in claim **6**, plate means for selectively closing one of said openings.

8. In a drawing mechanism for a spinning machine and the like, in combination:

(a) a stationary support;

(b) a carrier arm pivotable on said support toward and away from a position spacedly adjacent a drawing area;

(c) a plurality of top roller units,

(1) one of said units including a base member, an arm pivotally mounted on said base member, a top roller rotatable on said arm, and fluid operated pressure means tending to pivot said arm on said base member for moving said roller away from said base member; and

(2) another of said units including another base member, another arm pivotally mounted on said other base member, another top roller rotatable on said other arm, and spring means tending to pivot said other arm on said other base member for moving said other roller away from said other base member, said two units being formed to be interchangeable;

(d) rail means on, and approximately co-extensive with, said carrier arm for slidably receiving said interchanegable units; and

(e) fastening means releasably fastening said units along said rail means.

9. In a drawing mechanism for a spinning machine and the like, in combination:

(a) a stationary support;

(b) a carrier arm pivotable on said support toward and away from an operative position spacedly adjacent a drawing area;

(c) a plurality of top rollers movably mounted on said arm for cooperation with corresponding bottom roller means in said drawing area when said arm is in said operative position;

(d) membrane pressure means disposed on said arm for urging one of said top rollers to move away from said arm in a direction toward said drawing area when said arm is in said operative position;

(e) a source of pressure fluid operatively connected with said membrane pressure means;

(f) solid mechanical pressure means operatively interposed between said arm and another top roller for independently urging said other top roller to move away from said arm in a direction toward said drawing area while said one top roller is being urged

toward said drawing area by said membrane pressure means;

(g) valve means interposed between said source of pressure fluid and said membrane pressure means for controlling the fluid pressure exerted on said membrane pressure means; and

(h) locking means releasably securing said arm on said support against pivotal movement, said locking means including

(1) an actuating member on said arm; and

(2) locking means proper, said actuating member being adapted to cause said locking means proper to releasably secure said arm on said support while simultaneously acting on said valve means and operatively connecting said source of pressure fluid with said membrane pressure means.

References Cited by the Examiner

UNITED STATES PATENTS

2,793,400	5/1957	Kempe	19—272
2,867,852	1/1959	Dausch	19—267
2,890,495	6/1959	Miesch et al.	19—281 X
2,896,270	7/1959	Young et al.	19—269 X

FOREIGN PATENTS

1,192,060	4/1959	France.
798,562	7/1958	Great Britain.

DONALD W. PARKER, *Primary Examiner.*

D. NEWTON, *Assistant Examiner.*