Sept. 10, 1963 J. J. KEYSER 3,103,095

SPINNING OR TWISTING MACHINE

Filed Feb. 23, 1962 2 Sheets-Sheet 1

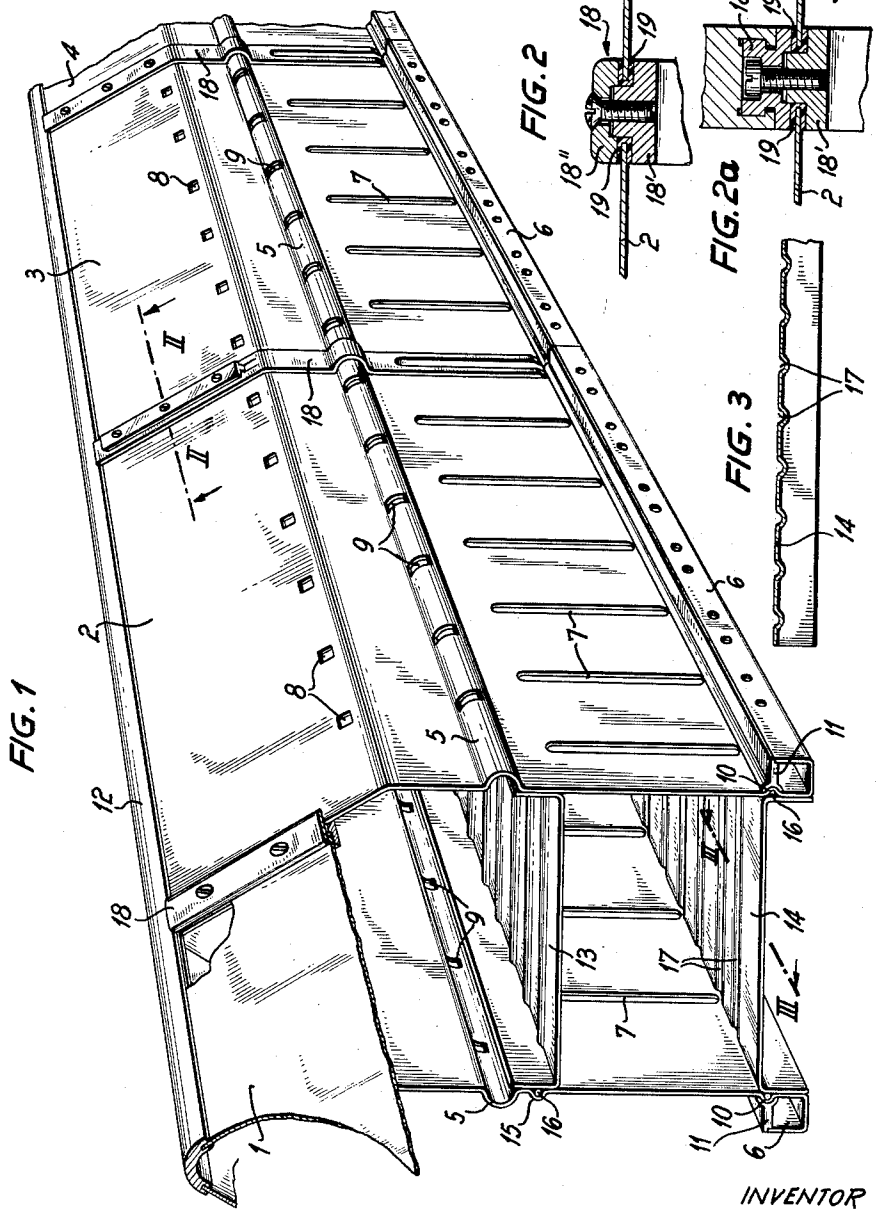


FIG. 1

FIG. 2

FIG. 2a

FIG. 3

INVENTOR

Johann Jacob Keyser

By

Walter Berry

Sept. 10, 1963 J. J. KEYSER 3,103,035

SPINNING OR TWISTING MACHINE

Filed Feb. 23, 1962 2 Sheets-Sheet 2

FIG. 4

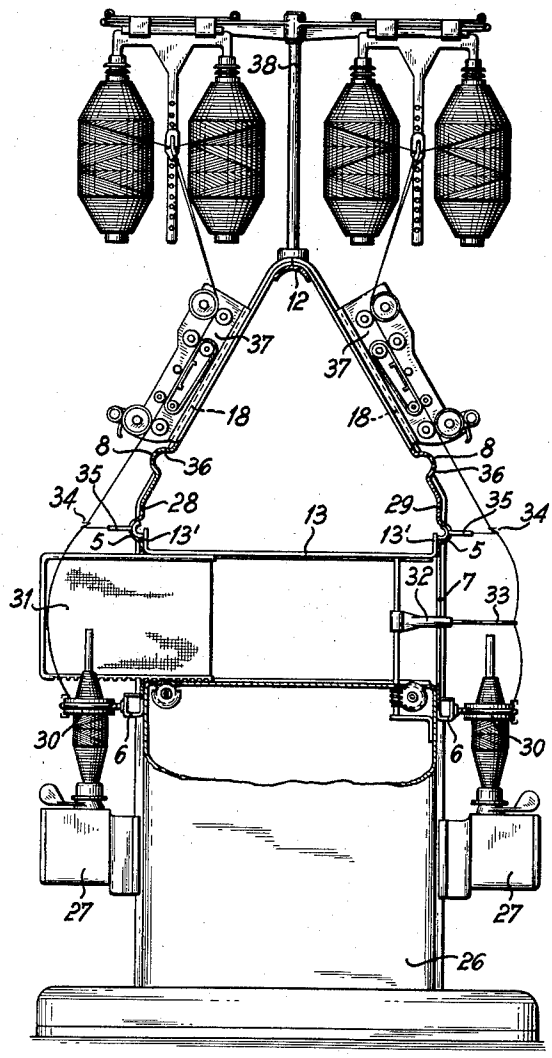
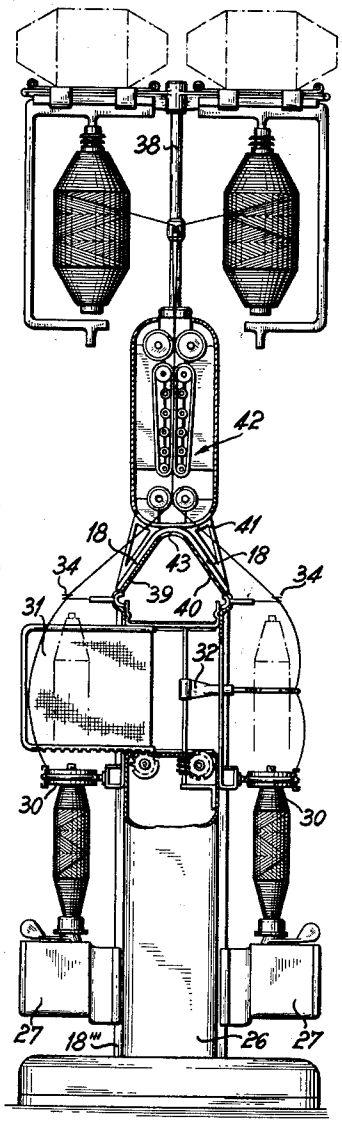


FIG. 5



INVENTOR

Johann Jacob Keyser

By Walter Berber

United States Patent Office 3,103,095 Patented Sept. 10, 1963

3,103,095

SPINNING OR TWISTING MACHINE

Johann Jacob Keyser, Grabenallee 16, Aarau, Switzerland

Filed Feb. 23, 1962, Ser. No. 175,234
Claims priority, application Germany Feb. 27, 1961
14 Claims. (Cl. 57—1)

The present invention relates to a spinning or twisting machine, and, more particularly, concerns a cover on the frame of a spinning or twisting machine, said cover being arranged in longitudinal direction of such machine and extending substantially from the roller beam to the spindles.

With the frames of heretofore known spinning and twisting machines, transversely directed framing units spaced from each other in longitudinal direction of the machine are distributed between the main drive frame and the end drive frame which two frames are in most instances box-shaped for housing the drive transmission elements. The said transversely directed frame units are interconnected by a plurality of frame members extending in longitudinal direction of the machine, as for instance spindle rails and roller beams, in order to form the base frame of the machine. Connected to these frame units and frame members are all parts necessary for the functioning of the machine, as for instance the driving drums for the spindles, the spindles themselves, the ring rail, the thread guide, and the drafting or delivery mechanism. In this connection it is irrelevant whether the framing is of cast iron or consists of sectional steel. For mounting the various individual parts required for a spinning station, there is additionally necessary a plurality of intermediate members which interconnect the individual parts and the frame parts involved, as for instance thread guide lappets tiltable by hinges, which thread guide lappets are mounted on the roller beam so as to be tiltable upwardly in common. Other such intermediate members are for instance the ring rail holder, connecting bars for the balloon separator or balloon restricting devices. To these have to be added the connecting members for said intermediate elements, such as screws, studs, nuts, and so on, which have numerous protrusions and due to their immediate neighborhood to the spinning range have the tendency easily to soil. In view of the ever increasing yarn body, all parts rotating at high speed cause air turbulences which have an unfavorable influence, as for instance increased development of dust, soiling of the yarn body or increased danger of accident for the machine operator.

For these reasons, industry has endeavored to provide various portions of the machine with protective covers in order to avoid the above mentioned unfavorable influences (see for instance U.S. Patent 2,391,135). These endeavors, however, involve elements in addition to those forming part of the machine, which additional elements in form of sheet metal parts had to be adapted to the structure of the respective machine and merely served as cover. Therefore, these covers had to be provided with openings of various shape and size in conformity with the respective moving and guiding elements on the frame in order to be able to maintain the function of such moving and guiding elements. In spite of the additional relatively high costs for these additional elements, which costs were caused by the specific structure of such covers, these covers do not meet any longer the general conditions of operation of modern textile machinery.

It is, therefore, an object of the present invention to provide a cover which will overcome the above mentioned drawbacks.

It is also an object of this invention to provide structural

means which will not only serve the purpose of heretofore known covers of the type mentioned above, but will above all avoid the deficiencies of the heretofore known covers and will make it possible to build up the framing at a relatively low cost.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of a cover according to the invention.

FIG. 2 is a section taken along the line II—II of FIG. 1.

FIG. 2*a* shows in a section similar to that of FIG. 2 a slight modification over the structure of FIG. 2.

FIG. 3 is a section taken along the line III—III of FIG. 1.

FIG. 4 diagrammatically illustrates a cross section through a ring spinning machine with a cover according to the invention.

FIG. 5 diagrammatically shows a cross section through a modified ring spinning machine with a cover according to the invention.

The present invention is characterized primarily in that the cover is designed as sole supporting apron for all superimposed spinning elements, such as thread guides, spinning ring, balloon separator and moving elements therefor, which are to be mounted on a plurality of adjacent spinning stations between the delivery roller pair and the spindles.

According to a preferred embodiment of the invention, the supporting skirt consists of individual sections adapted in the longitudinal direction of the machine to be connected one behind the other while the length of said individual sections corresponds to that of the individual sections of other parts of the machine, as for instance the spindle rail.

A further feature of the invention consists in that each individual section of the supporting skirt consists of a coherent plate body which has horizontally and/or vertically arranged corrugations, beads or other deformations designed for receiving spinning and movable elements and which at the same time increase the torsion resistance.

According to a highly advantageous embodiment of the invention, each individual section of the supporting skirt or cover has, at least at the level of the thread guide, a semicircular forwardly protruding bead and has its lower end provided for instance with a U-shaped forwardly protruding angle arranged at the level of the spinning rings. Furthermore, each individual section of the supporting cover has its upper end bent toward the central longitudinal plane of the machine. Advantageously, vertically arranged deformations are provided at the same spacing as the spindle pitch or the spacing between the spindles. The material of any formed openings may be folded over toward the rear to form a vertical reinforcement. Furthermore, according to another embodiment of the invention, each individual section of the supporting cover may have its bent-off portion provided with thread break suction openings and may have its upper portion of the bead provided with vertical slots for passing thread guides therethrough, whereas below said bead vertical openings may be provided as passage for the balloon separator, or restricting rings may be provided. The edge portion at the lower end is designed as connecting rail for the spinning rings.

Furthermore, there exists the possibility that each individual section of the supporting cover forms the outer wall of the lower frame and extends up to the legs for the frame. It is also possible that each individual

section of the supporting cover has its upper end extending up to the longitudinal central plane of the machine and, with the supporting cover of the other machine side, forms a hood.

According to a further embodiment of the present invention, the supporting covers of both machine sides are interconnected by horizontal bottoms, so that for instance air guiding passages or serpentine-like deformations are formed for horizontally guiding the balloon separator.

Advantageously, in all instances, provision is made that individual sections of the supporting cover which abut each other in longitudinal direction of the machine are connected by structural rails. Expediently, the structural rail is a two-sectional rail the lower part of which receives the ends of adjacent individual sections while the upper part is adapted to be clamped to the machine. It is furthermore possible to design the upper portion of the structural rail for receiving or guiding further machine parts, as for instance for supporting roller stands of a drafting mechanism or for guiding movable spindle rails. If desired, the individual sections of the supporting cover which are interconnected by the structural rails may form the machine frame itself.

Referring now to the drawings in detail, FIG. 1 illustrates a portion of a cover according to the invention. This cover is designed so as to form the only supporting cover for all superimposed spinning elements to be arranged at a plurality of adjacent spinning stations between the delivery roller pair and the spindles and also serves as sole supporting cover for any movable elements required for said spinning elements. The spinning elements may consist for instance of thread guide, spinning ring and balloon separator, while for instance the thread guide must be so arranged that it can be folded out of the way.

As will be evident from FIG. 1, the supporting cover consists of individual sections **1**, **2**, **3**, **4** adapted to be connected to each other and, in the longitudinal direction of the machine, behind each other. Of the said individual sections, only the sections **2** and **3** are illustrated in their entirety, whereas parts only are shown of the sections **1** and **4** of the supporting cover. Expediently, the length of an individual section of the supporting cover corresponds to an individual section of other parts of the machine, for instance of the spindle rail.

As will furthermore be evident from FIG. 1, each individual section of the supporting cover consists of a coherent plate body provided with horizontally as well as/or vertically arranged corrugations, beads or other deformations serving for receiving the spinning and moving elements. In addition thereto, these deformations simultaneously increase the resistance against distortion of the plate body so that the plate body has to be connected to the machine frame at a few places only. The plate body for the supporting covers may preferably be made of sheet metal but may naturally also consist of synthetic plates, vulcanized fiber or the like.

According to the embodiment shown in FIG. 1, the said deformations form a bead **5** of semicircular cross section which is arranged approximately at the level of the thread guide. According to this embodiment, the lower end of the supporting cover or skirt is provided with outwardly protruding edge portions **6** of U-shaped cross section which may for instance be arranged at the level of the spinning rings.

As will furthermore be evident from the drawing, each individual section of the supporting cover has its upper end bent or inclined toward the central longitudinal plane of the machine. In that portion of the individual section of the supporting cover which is located between bead **5** and edge portion **6**, evenly spaced longitudinal slots **7** are provided the spacing of which corresponds to the spindle spacing. These openings likewise form deformations which may be produced by stamping so that the stamped-out material may be folded toward the rear so as to form a vertical reinforcement. As will furthermore be evident from FIG. 1, each individual section of the supporting cover has its upper inclined portion provided with openings **8** for withdrawing the broken thread. The upper portion of the bead **5** is additionally provided with slots **9** for passing the thread guide therethrough.

The longitudinal slots **7** arranged below bead **5** may serve as passage for the balloon separators or balloon restrictors rings, whereas the edge portion **6** at the lower end of the individual sections is designed as connecting rail for the spinning rings.

According to a further development of the invention, the supporting cover may be provided with additional beads **10** for supporting a lid **11** which covers the U-shaped passages **6***a* formed by the edge portion **6**, this passage may serve as oil container for self-lubricating spinning rings.

The upper end of each individual section of the supporting cover preferably extends up to the central longitudinal plane of the machine and together with the supporting cover of the other machine side forms a hood. For purposes of connecting the individual sections of the supporting cover of one machine side with the individual sections of the supporting cover of the other machine side, the arrangements of FIG. 1 comprises a connecting rail **12** which extends symmetrically with regard to the longitudinal central plane of the machine. In addition thereto, the supporting covers of both machine sides may be interconnected by horizontal bottoms. According to FIG. 1, such horizontal bottom **13** is provided below bead **5**, while a further horizontal bottom **14** is arranged approximately at the level of the edge portion **6**. These bottoms have those ends thereof which are adjacent the supporting covers of both machine sides connected to said covers in any desired manner. The space between the connecting rail **12**, the bottom **13** and the wall portions of the supporting covers may be employed as air feeding passage. In such an instance a good seal between the bottom **13** and the walls of the supporting covers can be obtained by an additional bead **15** into which is inserted a sealing cord **16**, as illustrated on the left-hand side of FIG. 1. If desired, also the bead **10** at the bottom **14** may be provided with a similar sealing cord **16**. If the bottoms **13** and **14** in addition thereto are provided with corrugated deformations **17** spaced from each other by the same distance as the longitudinal slots **7**, horizontal guides will be formed for the balloon separator which are displaceably held in said longitudinal slots **7**. The cross section according to FIG. 3 clearly indicates the corrugated deformations **17** of the bottom **14** which deformations are so arranged that for instance every other deformation **17** can serve as guide for a balloon separator.

The structural rails **18** illustrated in cross section in FIGS. 2 and 2*a* serve for interconnecting the individual supporting cover sections **1** and **2**, **2** and **3**, **3** and **4**, etc. The structural rails **18** are according to FIGS. 2 and 2*a* two-sectional rails so that the lower part **18'** will receive the ends of adjacent individual sections, as for instance of the sections **2** and **3**, whereas the upper part **18''** of the structural rail **18** is adapted to be clamped upon the lower part **18'** whereby the marginal portions of the individual sections **2** and **3** of the supporting cover are clamped fast. If desired, a strip **19** of elastic material may be slipped over the marginal portions to be clamped-in of the individual sections. The strip **19** may serve as seal and will simultaneously also increase the clamping effect.

According to the modification illustrated in FIG. 2*a*, the upper part **18'''** of the sectional rail **18** may also serve as guide for further machine elements. Thus, for instance, the sectional rail **18'''** may serve for supporting the roller stands of a drafting mechanism. However, it

is also possible to employ the rail 18''' for guiding the movable spindle rail.

In addition to the above deformations of the supporting cover or skirt, there may also be provided further horizontal or vertical deformations. For instance, the openings 8 for withdrawing the broken thread may be arranged in the zenith range of a protruding bead in order in this way to shorten the distance between thread and withdrawal opening (see FIG. 4).

According to the embodiment illustrated in FIG. 4, the supporting covers or aprons of FIG. 1 have been designed as structural elements of a ring spinning machine illustrated in cross section in FIG. 4. The lower frame portion of the machine is formed by a substantially closed box 26 both sides of which have arranged thereon the spindle rails 27 for upward and downward movement.

At the upper end of the box 26 at the left-hand side of the machine there starts the supporting apron 28, whereas at the right-hand side of the machine there is arranged the supporting apron 29. Both aprons first extend upwardly and then are inclined toward the longitudinal central plane of the machine so that they form together with the connecting rail 12 a closed hood. At the lower end of the supporting aprons 28 and 29 there are provided the edge portions 6. At those legs of said edge portions 6 which are directed toward the spindles, there are connected the spinning rings 30. Longitudinally displaceably guided in longitudinal slots 7 of the supporting apron 28 are balloon separators 31, whereas in the same longitudinal slots of the supporting apron 29 on the right-hand side of the machine there are guided holding arms 32 which are movable upwardly and downwardly. At those ends of the holding arms 32 which are directed toward the spindles there are provided balloon constricting rings 33. Above the longitudinal slots 7 at the aprons 28 and 29 there is provided a forwardly protruding bead 5 which serves for carrying the threaded guides 34. These thread guides are mounted on foldable arms 35 which in slots 9 of the supporting covers 28 and 29 are tiltable upwardly and are guided on the inside of the supporting covers 28 and 29 in beads 5.

As will be evident from FIG. 4, the bottom 13 provided at approximately the level of the thread guides 34 has upwardly bent marginal portions 13' the edges of which simultaneously serve as abutment for the inner guiding means of the foldable arms 35. The arms 35 may be so designed that the slots 9 in bead 5 are closed in any position of the thread guides 34. Furthermore, it is possible to tilt upwardly each arm 35 individually or to tilt upwardly all of the arms 35 of a machine side by an actuating device common thereto. Shortly above the portion bent toward the central longitudinal plane of the machine, the supporting covers 28 and 29 have forwardly protruding beads 36 at the zenith portion of which there are provided openings 8 for broken threads. The sectional rails 18 simultaneously serve as support for the roller stands 37 of the drafting mechanism, while cylinders, rollers or the like, of a lower apron drafting mechanism known per se, are journalled in said roller stands 37. The connecting rail 12 arranged at the upper end of the supporting covers 28 and 29 has mounted thereon supports 38 to which are connected the elements necessary for the creel.

FIG. 5 illustrates a ring spinning machine similar to that of FIG. 4 but of a narrower design. The structural elements of the machine shown in FIG. 5 correspond substantially to those of FIG. 4, but the supporting aprons or skirts 39 and 40 are not as high as the corresponding aprons or skirts 28 and 29 of FIG. 4. Due to the fact that according to FIG. 5 a single vertical drafting mechanism is provided in which the sliver to be drafted passes along a plane which coincides with the longitudinal central plane of the machine, the drafted fiber material leaving the pair of delivery rollers has to be deflected alternately toward the left side and toward the right side of the machine. Also in this instance, the roller stands 41 serving for supporting the double apron drafting mechanism 42 are mounted on rails 18. The upper ends of the roller stands 41 are designed in form of a column and form a part of the creel. The supporting skirts 39 and 40 are directly interconnected at their upper ends. This connection may be obtained either by a close overlapping of marginal portions of the two skirts 39 and 40 or by making the same of a single plate. At the zenith of the thus formed hood, there may be provided suction openings 43 for drawing out the broken thread, which openings are directed toward the delivery roller clamping point of the drafting mechanism 42.

As will be evident from the above described embodiments, the supporting skirts carry all spinning elements superimposed upon each other and located between the pair of delivery rollers and the spindles and, more specifically, depending on their length receive the said elements for a higher or lower number of adjacent spinning stations. The construction of a spinning or twisting machine will in this way be considerably simplified because the supporting skirts combine in themselves a plurality of connecting frame members which are necessary in connection with the known spinning and twisting machines at different heights for mounting the individual spinning elements. Therefore, the supporting skirts can at least within their range form a part of the frame without the necessity of providing frame parts extending in longitudinal direction of the machine. Moreover, there also exists the possibility of extending the supporting skirts downwardly and designing the same so that they form an outer wall of the lower frame and extend to the base of the frame. This can be realized without difficulties when the rails 18 extend likewise to the bottom of the frame legs. With such a design of the supporting skirts it is even possible that the individual sections of the supporting skirts connected by the rails 18 form the frame itself. In this way an additional frame work as it is customary with heretofore known spinning or twisting machines will be superfluous.

The embodiments illustrate the various possibilities of employment of the supporting skirts according to the invention which may additionally be adapted to various spinning and twisting machines without changing the essence of the invention.

As will also be evident from the above, a spinning or twisting machine according to the invention is very simple in construction and permits a highly favorable mounting of all individual members necessary for the spinning operation without in any way interfering with the function thereof during the spinning operation. This favorably affects the spinning operation inasmuch as the supporting skirts form so to speak an air skirt arrangement which shrouds the spinning operation from all unfavorable air turbulences or the like. The danger of soiling of the individual parts and of the elements actuating the same is considerably reduced by the invention which fact in turn aids the safety of operation of spinning and twisting machines according to the invention.

It is, of course, to be understood that the present invention is, by no means, limited to the particular constructions shown in the drawings but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. In combination in a spinning or twisting machine: a frame having a roller beam, a plurality of spinning stations with spindles, a plurality of drafting mechanisms including pairs of delivery rollers, a plurality of spinning elements including thread guides and spinning rings and balloon restricting means associated with said spinning stations and arranged in superimposed position between the pair of delivery rollers and the spindle of the respective spinning station, and cover means connected to said frame and extending in longitudinal direction of said machine, said cover means extending substantially from

said roller beam to said spindles and forming the sole supporting skirt for all of said spinning elements, said cover means being composed of individual interconnected sections arranged one behind the other in longitudinal direction thereof and substantially corresponding to longitudinal sections of the machine, each individual section of said cover means having its lower portion provided with a fold of U-shaped cross section protruding outwardly, each individual section of said cover means additionally being provided with a semi-circular outwardly protruding bead at least at the level of said thread guides.

2. An arrangement according to claim 1, in which the machine has a sectional spindle rail, and in which the sections of said cover means correspond in length to the length of the individual spindle rail sections.

3. In combination in a spinning or twisting machine: a frame having a roller beam, a plurality of spinning stations with spindles, a plurality of drafting mechanisms including pairs of delivery rollers, a plurality of spinning elements including thread guides and spinning rings and balloon restricting means associated with said spinning stations and arranged in superimposed position between the pair of delivery rollers and the spindle of the respective spinning station, and cover means connected to said frame and extending in longitudinal direction of said machine, said cover means extending substantially from said roller beam to said spindles and forming the sole supporting skirt for all of said spinning elements, said cover means being composed of individual interconnected sections arranged one behind the other in longitudinal direction thereof and substantially corresponding to longitudinal sections of the machine, the upper portion of said cover means being inclined toward the longitudinal central plane of the machine, the upper inclined portion of each of said individual sections being provided with openings for sucking off broken fibers, each individual section of said cover means also being provided with a substantially horizontal bead portion provided with vertical slots for the passage of said thread guides, said cover means also being provided with vertical openings below said bead portion for the passage of balloon confining means therethrough, the lower portion of said cover means being provided with a folded portion forming a longitudinal rail for connecting the spinning rings thereto.

4. In combination in a spinning or twisting machine with drafting mechanisms on opposite longitudinal sides of said machine: a frame having a roller beam, a plurality of spinning stations with spindles, each of said drafting mechanisms including pairs of delivery rollers, a plurality of spinning elements including thread guides and spinning rings and ballon restricting means associated with said spinning stations and arranged in superimposed position between the pair of delivery rollers and the spindle of the respective spinning station, cover means arranged on both sides of the machine and connected to said frame and extending in longitudinal direction of said machine, said cover means extending substantially from said roller beam to said spindles and forming the sole supporting skirt for all of said spinning elements, said cover means being composed of individual interconnected sections arranged one behind the other in longitudinal direction thereof and substantially corresponding to longitudinal sections of the machine, the upper portion of each individual section of said cover means being inclined in the direction toward the central longitudinal plane of the machine and forming a hood with the oppositely located portion of the cover means section of the other machine side, and substantially horizontal corrugated members interconnecting oppositely located portions of cover means sections on both sides of the machine, said corrugated members forming guiding means for balloon restricting means.

5. In combination in a spinning or twisting machine: a frame having a roller beam, a plurality of spinning stations with spindles, a plurality of drafting mechanisms including pairs of delivery rollers, a plurality of spinning elements including thread guides and spinning rings and balloon confining means associated with said spinning stations and arranged in superimposed position between the pair of delivery rollers and the spindle of the respective spinning station, cover means connected to said frame and extending in longitudinal direction of said machine, said cover means extending substantially from said roller beam to said spindles and forming the sole supporting skirt for all of said spinning elements, said cover means being composed of individual sections arranged one behind the other in longitudinal direction thereof and substantially corresponding in length to the length of longitudinal sections of the machine, and rail means interconnecting said individual sections.

6. An arrangement according to claim 5, in which said rail means are composed of upper rail means and lower rail means for receiving therebetween the ends of the cover means sections to be interconnected, and means for clamping said upper and lower rail means together and thereby clamping the respective ends of said cover means sections therebetween.

7. An arrangement according to claim 5, in which said rail means include upper rail means and lower rail means arranged to receive and clamp therebetween marginal portions of the cover means sections to be interconnected, said upper rail means being provided with means for receiving and supporting additional elements of the machine.

8. An arrangement according to claim 5, in which said rail means include upper rail means and lower rail means for receiving and supporting roller stands.

9. An arrangement according to claim 5, which includes a movable spindle rail, and in which said upper rail means is provided with means for guiding said spindle rail.

10. An arrangement according to claim 5, in which the individual cover means sections interconnected by said rail means form the frame proper of said machine.

11. A frame structure for a textile machine formed of two oppositely located sets of sheet metal frame sections arranged symmetrically with regard to a plane forming the longitudinal plane of said machine frame, the sections of each of said sets being arranged in end to end relationship, the frame sections of said two sets comprising lower substantially vertical portions and also upper portions inclined in a roof-shaped manner toward each other with the upper edges thereof interconnected so as to form with each other a roof-shaped structure closed at the top, and substantially horizontally arranged plate means interposed between and connected to oppositely located frame sections of said two sets and together with said roof-shaped structure forming a longitudinal tubular channel to allow air to pass therethrough.

12. A frame structure according to claim 11, in which the roof-shaped upper portions are provided with apertures for withdrawing broken thread therethrough.

13. A frame structure according to claim 11, which includes additional horizontal plate means arranged below said first mentioned horizontal plate means and connected to the lower end of said vertical portions, said vertical portions being provided with substantially vertical slots arranged between said first mentioned and second mentioned horizontal plate means for passing thread guides therethrough.

14. A frame structure according to claim 13, in which the spacing of said slots from each other in longiutdinal direction of said frame structure corresponds substantially to that of the spacing between adjacent spindles.

References Cited in the file of this patent

UNITED STATES PATENTS

2,923,119 Nifenecker ---------- Feb. 2, 1960