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(54) **Apparatus for supplying spinners with bobbin material.**

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Description

The invention relates to an apparatus for continuously operating ring spinning machines or the like having a multitude of working units, a framework extending along said spinning machine, guide means for a carriage moving along said framework, the carriage having means for supplying each section of the spinning machine with full roving bobbins being transferred to a storage station and means for removing empty tubes, the framework being provided with unwinding stations for the unwinding of bobbins, the storage station and the unwinding station being arranged above the spinning units.

An apparatus of this type is known from EP-A-0240473. In said known apparatus, for each working unit, transfer and overturning means are provided in order to move mandrels for the support and retention of the roving bobbins from a position in which said bobbins are handled over by the transferring means located on the carriage, to the individual mandrels, to a feeding position at the underlying working units. This apparatus therefore requires relatively complex mechanisms for a considerable number of working units, as each spinning machine front can be provided with more than 200 spindles.

In EP-A-0213962 a device is described, for replacing empty tubes by roving bobbins combined with the piecing of the rovings on spinning machines. According to this known device, a first support for unwinding bobbins is provided along the spinning machine and a second support for full roving bobbins extends parallel to said first support. A carriage carries means which replace the empty tubes on the first support with full roving bobbins standing by on the second support. The carriage is provided with a complex mechanism for piecing the tail of the almost reeled off rovings with a new roving. Said carriage is however not provided with means for supplying full roving bobbins along said second support.

The object of the invention is to provide an apparatus of the above mentioned type, which has substantially simpler and less expensive mechanisms ensuring, however, a high degree of automation of operations for the supply and replacement of the bobbins.

This object is achieved, according to the invention, by means of an apparatus of the above mentioned type which is characterised in that in each section of the spinning machine the storage station comprises storage supports and the unwinding station comprises unwinding supports, being attached to the framework and that said means on the carriage for supplying the full bobbins comprises transferring means:

- a) for transferring a set of full bobbins from the carriage to the storage support,
 - b) for removing empty tubes from the unwinding support, and
 - c) for transferring full bobbins from the storage support via transition supports on the carriage to the unwinding support,
- and that the bobbins are transported in a hanging position.

In a particularly advantageous embodiment, the storage and unwinding supports are arranged above one another and the transferring means arranged on the carriage provides for:

- a) a transverse movement for transferring a set of full bobbins from the carriage to the storage support,
- b) a vertical and a subsequent transverse movement for removing empty tubes from the unwinding support,
- c) a vertical and a transverse movement for transferring the full bobbins from the storage support via the transition support to the unwinding support.

Advantageously, the transition support on the carriage may be placed, in this case, at the same height as said unwinding support.

Advantageously, the full roving bobbins and/or the empty tubes are borne by mandrels provided with retractable expansion means for the engagement and disengagement of the bobbins and/or the tubes, said mandrels being carried by a supporting frame which is moved by said transferring means disposed on the carriage. On each frame mandrels are predisposed in a number and position corresponding to the number and position of the bobbins to be disposed in each section of the working units of the spinning machine front to be supplied.

In a particularly simple embodiment, said first and said second support for receiving the unwinding bobbins and the full roving bobbins and said transition support on the mobile carriage comprise supporting profiles for the frame.

Said storage support for receiving the full roving bobbins may be disposed above and in correspondence of the unwinding support for the unwinding bobbins, and the supporting profiles of the upper support are in such case able to be withdrawn.

In practice, the means for transferring the bobbins and the empty tubes may comprise at least a cylinder-piston system for the motion of said frames, said system being displaceable in transverse direction with respect to the supplied spinning machine, and further means for the displacement of a frame provided with mandrels from the support located on the carriage to the support for receiving the unwinding bobbins, said means being operable independently of said cylinder-piston sys-

tem. The means for the displacement of the frame may comprise, e.g. a chain or the like able to slide in sliding guides.

The framework of the apparatus according to the invention may be disposed in central and symmetrical position relative to the spinning machine to be supplied between two fronts of said spinning machines, said carriage carrying two transition supports, symmetrically located with respect to the framework, for receiving a set of bobbins during the replacement phase of the same bobbins. Alternatively, said framework may be disposed between opposite fronts of two spinning machines extending parallel to one another.

The invention will be better understood by following the description and the attached drawing, which shows a practical, non limitative exemplification of the same invention. In the drawing:

Figs. 1 to 5 show the apparatus according to the invention in five subsequent phases concerning the supply of full bobbins and the replacement of empty tubes in a substantially cross-section view;

Fig. 6 shows a side partial view of the apparatus according to the invention;

Fig. 7 shows an empty tube collection phase; and

Fig. 8 shows a full bobbin supply phase.

The following description refers to an apparatus symmetrically disposed with respect to a spinning machine, capable of supplying the two fronts of spindles of the same spinning machine. However, it is not excluded, that an apparatus of similar type may be disposed between two side-by-side disposed spinning machine for the supply of bobbins to the working units (i.e. work groups) of two facing fronts of said spinners.

According to what is illustrated in the attached figures, to a spinning machine 1 having two fronts of spindles 3A and 3B respectively, there is combined a framework 5 carrying a guide 7 longitudinally extending throughout the spinner; on said framework a carriage 9 is able to move for the supply of full roving bobbins to the working units of the spinning machine 1. Said carriage 9 is able to slide in the direction of arrows f9 (Fig.6) along the whole extension of the spinning machine while picking up from a carriage or other, stacking device, disposed at one end of same spinning machine, the bobbins 27 to be fed to the various working units, and picking up from each working unit the empty tubes 31 (i.e. reeled off pipes) to store them in a suitable container located at the opposite end or at other suitable position with respect to the spinning machine 1. The working units or spindles 3A and 3B of the two work fronts of spinning machine 1 are grouped into sections, the spindles of each section being supplied simulta-

neously with roving bobbins. In the example of the drawing, each section of spindles or working units comprises four of said spindles (see Fig.6). A lower unwinding support 11 and an upper storage support 13 able to support a frame 15 carrying a set of mandrels (eight in the drawing) are combined to each section of working units. Said mandrels 17, of known type, have snap retractable expansion means, for example elastic flyers, for the engagement and the release of bobbins and/or empty tubes to be picked up from or fed to the working units of spinning machine 1.

On the carriage 9, a slide 21 is movable transverse to the longitudinal extension of the guide 7 for each front of spindles 3A, 3B, said slide carrying a cylinder-piston system 19 for the handling of frames 15 in a manner described below. In the drawing, one of said slides and one of said cylinder-piston systems are indicated in greater details, the other slide and the other system are only roughly indicated being symmetrical to the first ones. It is also possible to use a single slide 21 and a single cylinder-piston system. The carriage 9 carries also transition supports 23 for each of the two fronts of spinning machine 1 to be supplied, said transition supports 23 being disposed at the same height as the supports 11 of the framework 5.

Herebelow the phases of supplying full bobbins to the individual sections of spinning machine 1 are described with reference to Figs. 1 to 5. As shown in Fig. 1, on the frame 15 located on the lower support 11, substantially reeled-off unwinding bobbins 25 are borne by the corresponding mandrels 17. Therefore the replacement of the unwinding bobbins must be carried out. On the upper support 13 is a similar frame 15 whose mandrels carry full roving bobbins 27. Said frame 15 has been laid down in this position by the carriage 9 upon a previous supply stage. To carry out the replacement of frame 15 which carries the empty tubes 31 with the frame carrying the full bobbins, the carriage 9 moves in correspondence to the section in which the replacement is to be performed and picks up the frame 15 together with bobbins 27, located on the supports 13, by means of the cylinder-piston system 19. Through a transverse displacement of slide 21 in direction of arrow f1 (Fig.2), the full bobbins 27 are brought in correspondence of support 23, which is rigidly connected to carriage 9, and released on said support upon lowering of the cylinder-piston system 19 in the direction of arrow f2 (Fig.3). After the frame 15 with full bobbins 27 has been laid down on the carriage support 23, the joining of the free ends 29 of the rovings wound on full roving bobbins 27 with the end portions of the roving which is reeling off from bobbins 25, and then the cutting of the reeled

off roving may be performed. The joined rovings are shown in Fig.3. As the spinning operation performed by the corresponding working units or spindle 3B goes on, the free ends 29 of the new rovings carried by bobbins 27 are introduced into the corresponding spindle 3B, so that the feeding of the roving to the spindle 3B takes place with continuity.

Fig.4 shows how the new roving from the bobbins 27 has replaced the roving reeled off from unwinding bobbins 25. The empty tubes 31 may at this point be collected by the cylinder-piston system 19 of carriage 9 which to this end, after having placed frame 15 with bobbins 27 on support 23, moves transversally in direction of arrow f3 towards the center line of carriage 9, and lowers down again according to arrow f4 to pick up the frame with the empty tubes 31 from the support 11.

Fig.5 shows the following phase of displacement of frame 15 carrying the full roving bobbins 27 from the transition support 23 solid to the carriage, to the unwinding support 11 of the framework 5. While the cylinder-piston system 19 causes the empty tubes 31 to raise according to arrow f6, thrust members 30 carried by carriage 9 push the frame 15 carrying the full roving bobbins 27 from the transition support 23 to the unwinding support 11 according to arrow f8. To allow the lifting of the frame 15 carrying the empty tubes 31 by the cylinder-piston system 19, the storage support 13 solid to framework 5 is provided with supporting flyers as those shown in Fig.6, which may take up a withdrawn position (shown in hatched lines in said Fig.6) to allow the transit of the frame 15 to be picked up. The lower support 11 may instead be made up of fixed flyers.

The thrust members 30 may consist in particular of a chain or the like, sliding within guide members carried by the carriage 9 and by the transition support 23.

After having lifted the frame 15 carrying the empty tubes, and after having pushed the frame carrying the full roving bobbins 27 into the feeding position, i.e. onto unwinding supports 11, carriage 9 is able to carry the empty tubes 31 from the just supplied working unit to an empty tube collector located at one of the ends of the spinner to be fed or at any other suitable position. To this purpose (see Fig.7), the cylinder-piston system 19 is moved by the slide 21 in the direction of arrow f10 transversally with respect to spinning machine 1 up to be positioned outside the set of supports 11, 13. Carriage 9 is thus free to move along guides 7 up to the position in which the empty tubes collection point is located, where cylinder-piston system 19 is able to lower according to arrow f12 (see Fig.7) and thus release the reeled off pipes 25. Since the mandrels 17 are provided with snap retractable

expansion means, by pressing the lower portion of the reeled off pipes on a reference plane, the retraction of the expansion means and then the release of said empty tubes 31 is obtained, while the frame 15 remains engaged to the cylinder-piston system 19 for subsequently drawing a set of full bobbins.

Referring now to Fig.8, when carriage 9 has performed the operations for the replacement of empty tubes 31, it can carry out the positioning of a set of bobbins 32 also borne by a frame 15, which are positioned into the storage support 13 above the full roving bobbins 27. To this end, carriage 9 moves in correspondence of the position wherein the full roving bobbins are stored, e.g. to one end of spinner 1, where small carriages in which the full roving bobbins coming from the previous workings are predisposed in positions corresponding to those of mandrels 17 on the relevant frames 15. When cylinder-piston system 19 carrying a frame 15 moves downwards against a set of bobbins predisposed to be drawn, the pressure exerted by same bobbins onto the snap members of the expansion means of mandrels 17 causes the extraction of said expansion means and the consequent engagement of the roving bobbins with the relevant mandrels, so that frame 15 can be lifted and moved by carriage 9 in correspondence of the section to be supplied. Bobbins 32 will then be moved, during a subsequent replacement phase of the empty tubes 31 picked up by the cylinder-piston system 19, above storage supports 23, through a transversal displacement manoeuvre by means of members 30, to take the place of the empty tubes 31 on support 11.

It should be evident that, in order to permit the travel of carriage 9 along the spinning machine 1, due to the presence of supports 11 and 13 of the framework 5, the cylinder-piston system 19 will have to be located, during the transfer phase of frames 15 (either they carry empty tubes 31 or full roving bobbins) at the outer position on carriage 9, i.e. at the position shown in Fig.7. Once the carriage 9 has been moved in correspondence of the section of work groups 3 to be supplied, cylinder-piston system 19 carried by slide 21 will move according to arrow f14 (Fig.8) in order to place the new roving bobbins 32 in the proper position on storage supports 13.

It is evident that carriage 9 can carry one or two cylinder-piston systems 19, in the latter case each cylinder-piston system serving one of the two fronts of spinning machine 1. The use of two cylinder-piston systems 19 and of corresponding slides 21 allows the simultaneous supply of opposite sections of work groups 3A, 3B with a reduction of work time. The system shall be provided with sensors able to detect the reeling off condition

of the unwinding bobbins to allow an automated supply of new roving bobbins to the individual sections of the work groups 3A, 3B. As the time required for the unwinding of the individual roving bobbins is relatively long, there is time available to allow the carriage 9 and the other relevant equipment for the handling of frames 15 to supply the various storage supports 13 with stock bobbins 32.

As will be evident to those skilled in the art, the described apparatus, even allowing an elevated automation of the supply operations in a continuous spinning machine, has an extremely simplified structure as it does not require bobbin and pipe handling mechanisms for the individual sections or for the individual work groups of the spinner 1. On the contrary, according to the present invention, the only handling members and mechanisms are disposed on the carriage 9, while framework 5 does not have any auxiliary mechanism. This allows great saving and simplifications of the apparatus, as all the handling mechanisms are single or at the most double in case carriage 9 is equipped with two slides 21 and relevant cylinder-piston systems 19, while only fixed supports 11 and 13 are disposed in correspondence of the work groups of spinning machine 1.

By means of the apparatus according to the invention it is also possible to replace the bobbins without interrupting the supply of spinning machine 1. In fact, when the empty tubes 31 and the full roving bobbins 27 which shall substitute the latter are arranged side-by-side as shown in Fig.3, it is possible to carry out the tailing between the end portions of the rovings unwinding from bobbins 25 and the free ends 29 of the rovings wound up on full roving bobbins 27. As the spindles 3A and 3B continue the spinning operation, the end portions of the rovings unwinding from the bobbins 25 will drag along the initial free ends 29 of bobbins 27 towards the entry of the relevant work groups. Owing to the low speed with which the rovings are unwound from the relevant bobbins, this joining operation is particularly handy as it can be carried out easily and with enough time before the roving unwinding from the bobbins 25 is completely reeled off. This is allowed by the fact that the apparatus according to the invention provides for the temporary side-by-side arrangement of unwinding bobbins which are about to be completely reeled off and of full roving bobbins to be replaced. After having performed the joining of the free ends 29 of the rovings wound on bobbins 27, the end portions of the rovings unwinding from the bobbins 25 can be cut away.

Thus, a further advantage of the apparatus results evident from what has been illustrated. As the reeling off time of a bobbin 25 being fed to the spinner is very long (possibly taking even two

days), the carriage 9 for the transfer of frames 15 with full roving bobbins 27 has sufficient time to fill the storage supports 13 solid to the framework 5 with frames 15 and relevant full roving bobbins 27. A real stocking store is thus formed in correspondence of spinning machine 1 for the bobbins standing by to be worked by spinning machine 1. Therefore the need of stocking these bobbins in especially provided carriages located in rooms for intermediate storing use (with evident waste of space and high transfer costs for moving the bobbins from the stocking store to the spinner) is eliminated; with the apparatus according to the invention the stocking takes place directly in correspondence of the zone in which the next working of the roving is carried out.

Claims

1. Apparatus for continuously operating ring spinning machines or the like having a multitude of working units, a framework extending along said spinning machine, guide means for a carriage moving along said framework, the carriage having means for supplying each section of the spinning machine with full roving bobbins being transferred to a storage station and means for removing empty tubes, the framework being provided with unwinding stations for the unwinding of bobbins, the storage station and the unwinding station being arranged above the spinning units, said apparatus characterised in that in each section of the spinning machine the storage station comprises storage supports (13) and the unwinding station comprises unwinding supports (11), being attached to the framework (5) and that said means (19, 30) on the carriage (9) for supplying the full bobbins (27) comprises transferring means:

- a) for transferring a set of full bobbins (27) from the carriage (9) to the storage support (13),
- b) for removing empty tubes (31) from the unwinding support (11), and
- c) for transferring full bobbins (27) from the storage support (13) via transition supports (23) on the carriage (9) to the unwinding support (11),

and that the bobbins are transported in a hanging position.

2. Apparatus according to claim 1, characterised in that said storage supports (13) and said unwinding supports (11) are arranged above one another, and that said transferring means (19; 30) on the carriage (9) provides for:

- a) a transverse movement for transferring a

set of full bobbins (27) from the carriage (9) to the storage support (13),

b) a vertical and a subsequent transverse movement for removing empty tubes (31) from the unwinding support (11),

c) a vertical and a transverse movement for transferring the full bobbins from the storage support (13) via the transition support (23) to the unwinding support (11).

3. Apparatus according to claim 2, characterised in that said transition support (23) on the carriage (9) is placed at the same height as said unwinding support (11).

4. Apparatus according to claim 1, 2 or 3, characterised in that the full roving bobbins and/or the empty tubes (31) are borne by mandrels (17) provided with retractable expansion means for the engagement and disengagement of the bobbins and/or the tubes, said mandrels being carried by a supporting frame (15) which is moved by said transferring means (19; 30) disposed on the carriage (9); and that on each frame mandrels are disposed in a number and position corresponding to the number and position of the bobbins to be disposed in each section of the front of the spinning machine to be supplied.

5. Apparatus according to claim 4, characterised in that said unwinding and said storage support (11, 13) for receiving the unwinding bobbins (25) and the full roving bobbins (27) standing by for a successive replacement, and said transition support (23) on the mobile carriage (9) comprise supporting profiles for said frame (15).

6. Apparatus according to the preceding claims, characterized in that the supporting profiles of the storage support (13) are able to be withdrawn.

7. Apparatus according to claim 4, characterised in that said transferring means on the carriage (9) comprise at least a cylinder-piston system (19) for moving said frames (15), which is displaceable in a direction transverse to the supplied spinning machine (1).

8. Apparatus according to claim 7, characterised in that said transferring means further comprise members (30) for the displacement of a frame (15) provided with mandrels from the transition support (23) located on the carriage (9) to the unwinding support (11), said members (30) being operable independently of said

cylinder-piston system (19).

9. Apparatus according to claim 8, characterised in that said further members (30) for the displacement of the frame (15) comprise a chain or the like able to slide in corresponding sliding guides.

10. Apparatus according to the preceding claims, characterised in that said framework (5) is disposed in a central and symmetrical position with respect to the spinning machine (1) to be supplied, between the two fronts of same spinning machine, said carriage (9) carrying two transition supports (23), symmetrically located with respect to the framework, for receiving a set of bobbins during the replacement phase of the same bobbins.

11. Apparatus according to claims 1 to 9, characterised in that said framework is disposed in an intermediate position between two spinning machines extending parallel to one another, said carriage being provided with two transition supports (23) for receiving a set of bobbins during the replacement phase of same bobbins, each transition support serving for one of the opposite spindle fronts of the two spinning machines.

12. Apparatus according to the preceding claims, characterised in that the transferring means located on said carriage (9) comprise two cylinder-piston systems (19).

13. Method for the replacement of empty pipes with full roving bobbins in a continuous spinning machine by the use of the apparatus according to claims 1 to 12, characterised by predisposing of a frame (15) on a transition support (23) provided on a carriage (9), said frame (15) carrying a set of full roving bobbins (27), jointing of the free end (29) of the roving of said full roving bobbins (27) with the end portion of the roving as it unwinds from the unwinding bobbins (25) during the unwinding phase.

14. Method according to claim 13, characterised in that the end portion of the roving in the unwinding phase is cut away after its tailing with the free end of the roving of the full bobbins (27).

Patentansprüche

1. Vorrichtung zum kontinuierlichen Betreiben von Ringspinnmaschinen oder dergleichen mit einer Vielzahl von Arbeitseinheiten, mit einem

längs der Maschine verlaufenden Gerüst, Führungsmitteln für einen entlang dem Gerüst bewegbaren Wagen, der Mittel zum Versorgen jeder Sektion der Spinnmaschine mit vollen Faserspulen, die in eine Speicherstation überführt werden, und Mittel zum Entfernen leerer Röhrchen aufweist, wobei das Gerüst mit Abspulstationen zum Abspulen der Spulen versehen ist und die Speicherstation und die Abspulstation oberhalb der Spinnheiten angeordnet sind, dadurch **gekennzeichnet**, daß in jeder Sektion der Spinnmaschine die Speicherstation Speicherhalterungen (13) und die Abspulstation Abspulhalterungen (11) aufweist, die an dem Gerüst (5) befestigt sind und daß die an dem wagen (9) vorgesehenen Mittel (19, 30) zum Zuführen der vollen Spulen (27) Übergabemittel aufweisen, die

- a) einen Satz voller Spulen (27) von dem Wagen (9) an die Speicherhalterung (13) übergeben,
- b) leere Röhrchen (31) von der Abspulhalterung (11) entfernen und
- c) volle Spulen (27) von der Speicherhalterung (13) über Zwischenhalterungen (23) an dem wagen (9) an die Abspulhalterung (11) übergeben,

und daß die Spulen in hängender Anordnung transportiert werden.

2. Vorrichtung nach Anspruch 1, dadurch **gekennzeichnet**, daß die Speicherhalterungen (13) und die Abspulhalterungen (11) übereinander angeordnet sind und daß die Übergabemittel (19, 30) an dem Wagen (9)
 - a) eine Querbewegung für die Übergabe eines Satzes voller Spulen (27) von dem Wagen zu der Speicherhalterung (13),
 - b) eine Vertikalbewegung und anschließende Querbewegung zum Entfernen leerer Röhrchen (31) von der Abspulhalterung (11),
 - c) eine Vertikalbewegung und Querbewegung zur Übertragung der vollen Spulen von der Speicherhalterung (13) über die Zwischenhalterung (23) auf die Abspulhalterung (11) durchführen.

3. Vorrichtung nach Anspruch 2, dadurch **gekennzeichnet**, daß die Zwischenhalterung (23) an dem Wagen (9) in gleicher Höhe wie die Abspulhalterung (11) angeordnet ist.

4. Vorrichtung nach Anspruch 1, 2 oder 3 dadurch **gekennzeichnet**, daß die vollen Faserspulen und/oder die leeren Röhrchen (31) von Dornen (17) getragen werden, die mit einziehbaren Spreizmitteln für das Ergreifen und Frei-

geben der Spulen und/oder Röhrchen versehen sind, wobei diese Dorne von einem Stützrahmen (15) getragen sind, der von den am Wagen (9) vorgesehenen Übergabemitteln (19, 30) bewegt wird; und daß die Dorne an jedem Rahmen in einer Anzahl und Anordnung vorgesehen sind, die der Anzahl und Anordnung der Spulen entsprechen, die in jeder zu versorgenden Sektion an der Front der Spinnmaschine angeordnet werden sollen.

5. Vorrichtung nach Anspruch 4, dadurch **gekennzeichnet**, daß die Abspulhalterung und Speicherhalterung (11, 13) für die Aufnahme der abzuspulenden Spulen (25) und der vollen Faserspulen (27) in Bereitschaftsstellung für einen folgenden Austausch vorgesehen sind und daß die Zwischenhalterung (23) an dem bewegbaren Wagen (9) Stützprofile für den Rahmen (15) aufweist.

6. Vorrichtung nach den vorhergehenden Ansprüchen, dadurch **gekennzeichnet**, daß die Stützprofile der Speicherhalterung (13) wegnehmbar sind.

7. Vorrichtung nach Anspruch 4, dadurch **gekennzeichnet**, daß die Übergabemittel an dem Wagen (9) mindestens ein Kolbenzylindersystem (19) zum Bewegen der Rahmen (15) aufweist, welches in einer Richtung quer zu der zu versorgenden Spinnmaschine (1) bewegbar ist.

8. Vorrichtung nach Anspruch 7, dadurch **gekennzeichnet**, daß die Übergabemittel ferner Elemente (13) für das Verschieben eines mit Dornen versehenen Rahmens (15) von der Zwischenhalterung (23) am Wagen (9) zu der Abspulhalterung (11) aufweist, wobei die Elemente (13) unabhängig von dem Kolbenzylindersystem (19) betätigbar sind.

9. Vorrichtung nach Anspruch 8, dadurch **gekennzeichnet**, daß die weiteren Elemente (30) für das Verschieben des Rahmens (15) eine Kette oder dergleichen umfassen, die in entsprechenden Führungen verschiebbar ist.

10. Vorrichtung nach den vorhergehenden Ansprüchen, dadurch **gekennzeichnet**, daß das Gerüst (5) in mittiger und symmetrischer Anordnung zu der zu versorgenden Spinnmaschine (1) zwischen den beiden Arbeitsfronten dieser Spinnmaschine angeordnet ist, und daß das Gerüst (9) zwei Zwischenhalterungen (23) trägt, die symmetrisch zu dem Gerüst angeordnet sind, um jeweils eine Gruppe von Spu-

len während der Auswechselphase der Spulen aufzunehmen.

11. Vorrichtung nach den Ansprüchen 1 - 9, dadurch **gekennzeichnet**, daß das Gerüst in einer Zwischenposition zwischen zwei parallel zueinander angeordneten Spinnmaschinen angeordnet ist, wobei der Wagen mit zwei Zwischenhalterungen (24) zur Aufnahme einer Gruppe von Spulen während der Auswechselphase der Spulen versehen ist, wobei jede Zwischenhalterung eine der sich gegenüberstehenden Arbeitsfronten der beiden Spinnmaschinen bedient. 5 10 15
12. Vorrichtung nach den vorangehenden Ansprüchen, dadurch **gekennzeichnet**, daß die an dem Wagen (9) angeordneten Übergabemittel zwei Kolbenzylindersysteme (19) umfassen. 20
13. Verfahren für das Auswechseln von leeren Röhrchen gegen volle Faserspulen in einer kontinuierlichen Spinnmaschine unter Verwendung einer Vorrichtung gemäß den Ansprüchen 1 - 12, dadurch **gekennzeichnet**, daß auf einer auf einem Wagen (9) angeordneten Zwischenhalterung (23) vorweg ein Rahmen (15) angeordnet wird, der eine Gruppe von vollen Faserspulen (27) trägt, und daß das freie Ende (29) der Faserstränge der vollen Faserspulen (27) des Faserstrangs, der von den abspulenden Spulen (25) abgespult wird, während der Abspulphase verbunden wird. 25 30 35 40
14. Verfahren nach Anspruch 13, dadurch **gekennzeichnet**, daß der Endabschnitt des Faserstrangs in der Abspulphase nach seiner Verbindung mit dem freien Ende des Faserstrangs der vollen Spulen (27) abgeschnitten wird. 45

Revendications

1. Appareil pour le fonctionnement en continu de métiers à tisser annulaires ou analogues comportant plusieurs unités de travail, un châssis s'étendant le long de ce métier à tisser, des moyens de guidage pour un chariot se déplaçant le long du châssis, le chariot comportant des moyens pour alimenter chaque section du métier à tisser en bobines de condensateur ou de banc pleines à transférer sur un poste de stockage et des moyens destinés à évacuer les tubes vides, le châssis étant muni de postes de dévidage pour le dévidage des bobines, le poste de stockage et le poste de dévidage étant disposés au-dessus des unités de tissage, l'appareil étant caractérisé en ce que dans 50 55

chaque section du métier à tisser le poste de stockage comprend des supports de stockage (13) et le poste de dévidage comprend des supports de dévidage (11) fixés sur le châssis (5) et en ce que les moyens (19, 30) sur le chariot (9) destiné à amener les bobines pleines (27) comprend des moyens de transfert :

- a) pour transférer on jeu de bobines pleines (27) à partir du chariot (9) vers le support de stockage (13),
- b) pour évacuer des tubes vides (31) à partir du support de dévidage (11) et,
- c) pour transférer des bobines pleines (27) à partir du support de stockage (13) par l'intermédiaire de supports de transition (23) sur le chariot (9) à destination du support de dévidage (11),

et en ce que les bobines sont acheminées dans une position accrochée ou suspendue.

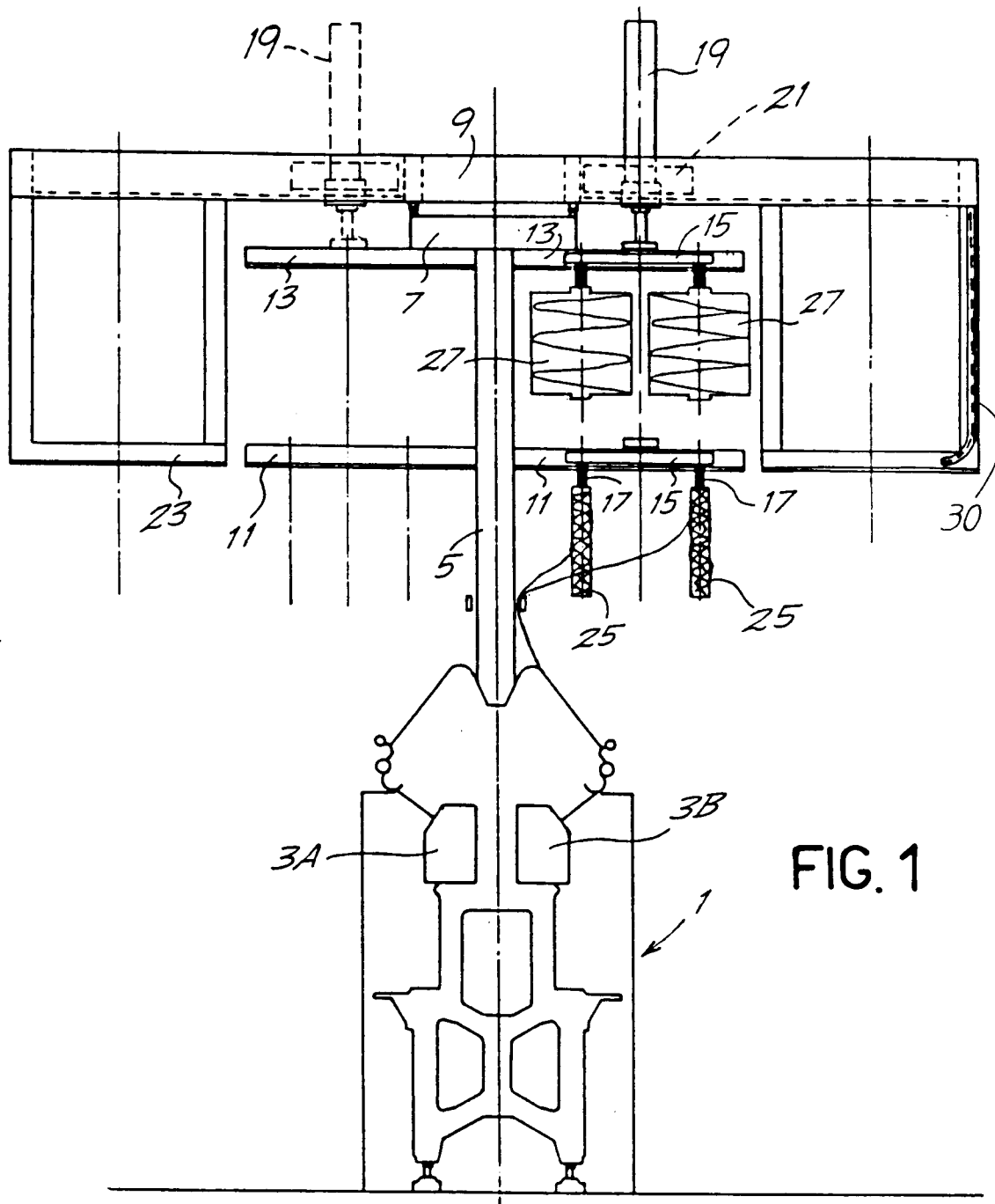
2. Appareil selon la revendication 1, caractérisé en ce que les supports de stockage (13) et les supports de dévidage (11) sont disposés l'un au-dessus de l'autre et en ce que les moyens de transfert (19, 30) sur le châssis (9) assurent :
 - a) Un mouvement transversal pour transférer une série de bobines pleines (27) à partir du chariot (9) vers le support de stockage (13),
 - b) un mouvement vertical et un mouvement transversal subséquent pour évacuer les tubes vides (31) à partir du support de dévidage (11),
 - c) un mouvement vertical et un mouvement transversal pour transférer les bobines pleines à partir du support de stockage (13) par l'intermédiaire du support de transition (23) vers le support de dévidage (11).
3. Appareil selon la revendication 2, caractérisé en ce que le support de transition (23) sur le chariot (9) est placé à la même hauteur que le support de dévidage (11).
4. Appareil selon la revendication 1, 2 ou 3, caractérisé en ce que les bobines de condensateur pleines et/ou les tubes vides (31) sont portés par des mandrins (17) munis de moyens d'extension escamotables pour la solidarisation et la désolidarisation des bobines et/ou tubes, les mandrins étant portés par un châssis de support (15) qui est déplacé par les moyens de transfert (19, 30) disposés sur le chariot (9) et en ce que sur chaque châssis sont disposés des mandrins dans un nombre et dans une position correspondant au nombre et à la position des bobines à disposer dans

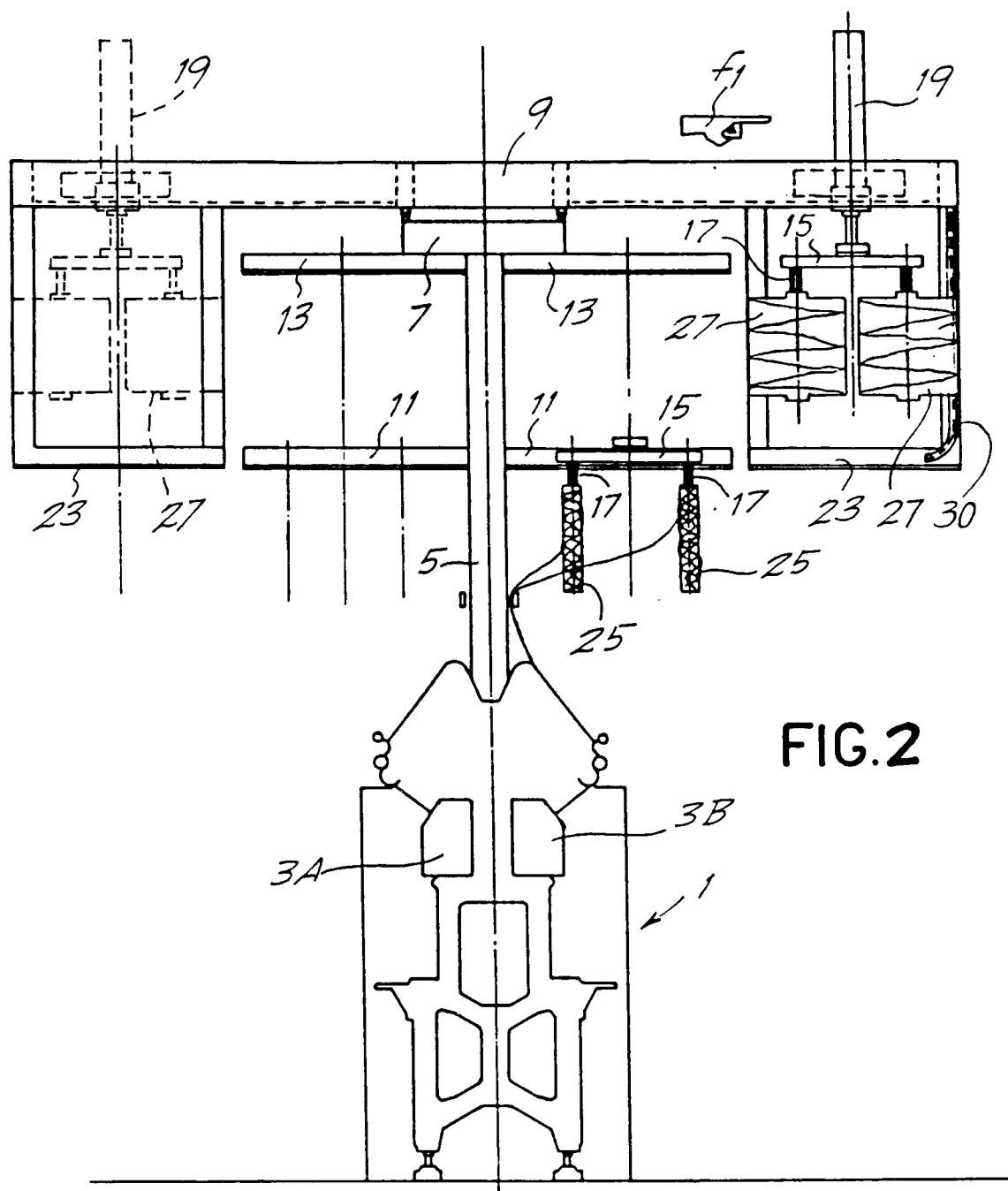
chaque section devant le métier à tisser à alimenter.

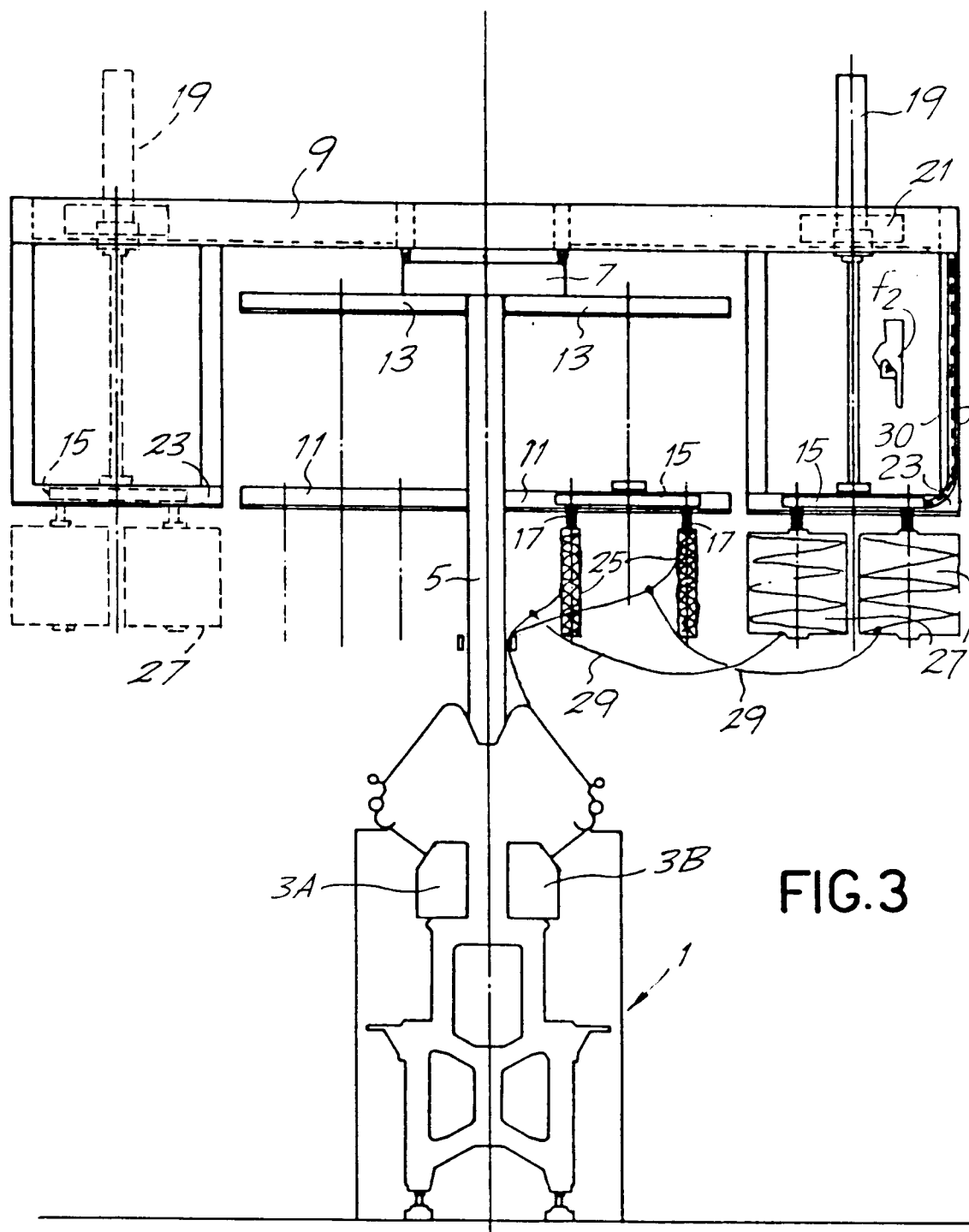
5. Appareil selon la revendication 4, caractérisé en ce que le dévidage et le support de stockage (11, 13) destinés à recevoir les bobines de dévidage (25) et les bobines de condensateur pleines (27) en attente d'un remplacement successif et le support de transition (23) sur le chariot mobile (9) comprennent des profilés de support pour le châssis (15). 5
6. Appareil selon les revendications précédentes, caractérisé en ce que les profilés de support du support de stockage (13) peuvent être escamotés. 10
7. Appareil selon la revendication 4, caractérisé en ce que les moyens de transfert sur le chariot (9) comprennent au moins un système à piston-cylindre (19) destiné à déplacer les châssis (15) qui est déplaçable dans une direction transversale au métier à tisser alimenté (1). 15
8. Appareil selon la revendication 7, caractérisé en ce que les moyens de transfert comprennent de plus des éléments (30) pour le déplacement d'un châssis (15) muni de mandrins à partir d'un support de transition (23) situé sur le chariot (9) vers le support de dévidage (11), les éléments (30) pouvant être actionnés indépendamment du système piston-cylindre (19). 20
9. Appareil selon la revendication 8, caractérisé en ce que les éléments supplémentaires (30) pour le déplacement du châssis (15) comprennent une chaîne ou élément analogue pouvant coulisser dans des guidages coulissants correspondants. 25
10. Appareil selon les revendications précédentes, caractérisé en ce que le châssis (5) est disposé dans une position centrale et symétrique par rapport au métier à tisser (1) à alimenter, entre les deux parties avant du même métier à tisser, le chariot (9) transportant deux supports de transition (23), situés symétriquement par rapport au châssis, pour recevoir une série de bobines pendant la phase de remplacement des mêmes bobines. 30
11. Appareil selon les revendications 1 à 9, caractérisé en ce que le châssis est disposé dans une position intermédiaire entre deux métiers à tisser s'étendant parallèlement l'un par rapport à l'autre, le chariot étant muni de deux supports de transition (23) pour recevoir une série 35

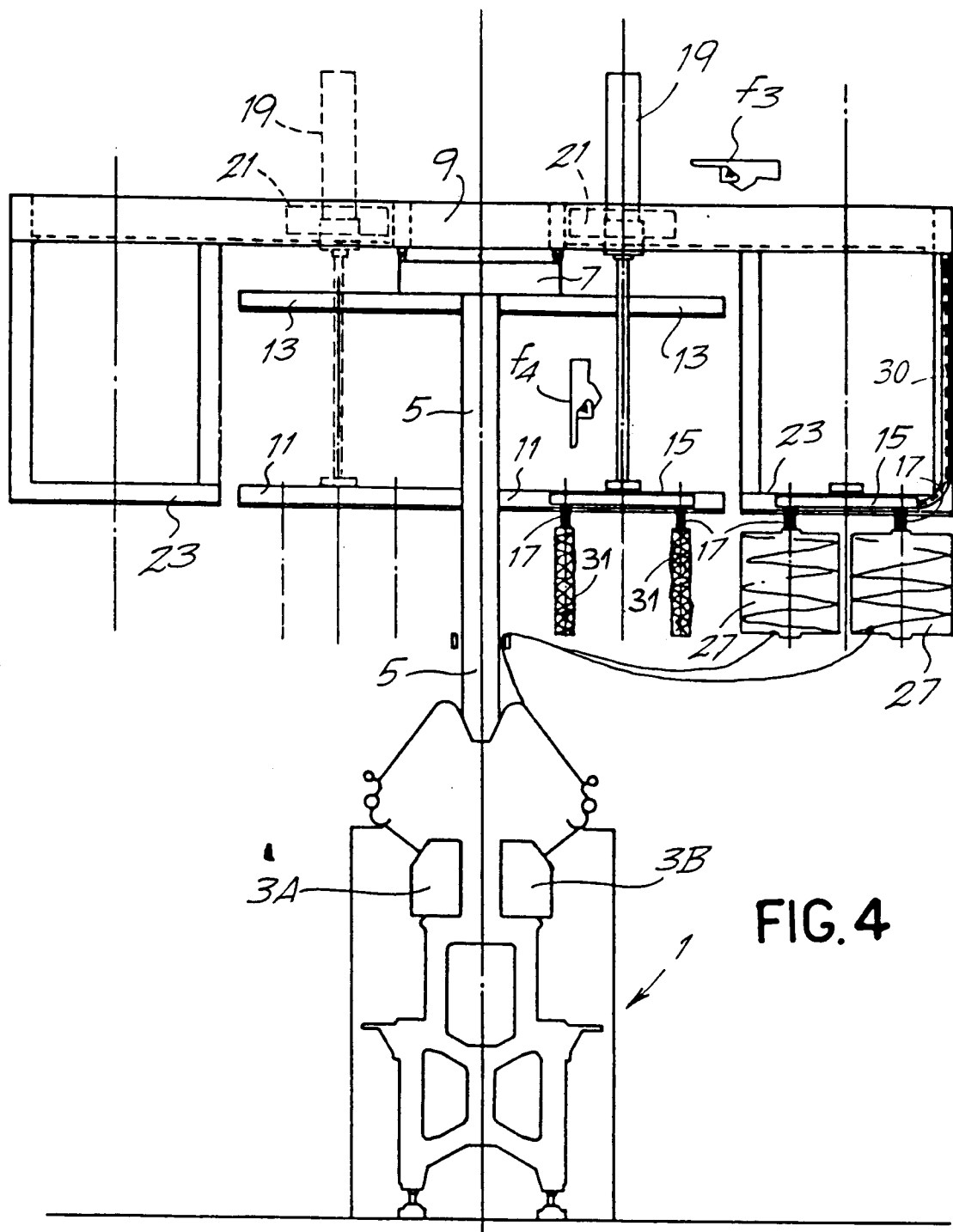
de bobines pendant la phase de remplacement des mêmes bobines, chaque support de transition servant pour l'un des éléments avant opposés de broche des deux métiers à tisser.

12. Appareil selon les revendications précédentes, caractérisé en ce que les moyens de transfert situés sur le chariot (9) comprennent deux systèmes à piston-cylindre (19). 40
13. Procédé pour le remplacement de tubes vides par des bobines de condensateur pleines dans un métier à tisser fonctionnant en continu en utilisant l'appareil selon les revendications 1 à 12, caractérisé par le fait de prévoir un châssis (15) sur un support de transition (23) monté sur un chariot (9), le châssis (15) supportant une série de bobines de condensateur pleines (27), de joindre l'extrémité libre (29) de la mèche des bobines de condensateur pleines (27) avec le portion d'extrémité de la mèche à mesure qu'elle se dévide à partir des bobines de dévidage (25) pendant la phase de dévidage. 45
14. Procédé selon la revendication 13, caractérisé en ce que la portion d'extrémité de la mèche dans la phase de dévidage est coupée après son assemblage avec l'extrémité libre de la mèche des bobines pleines 27. 50









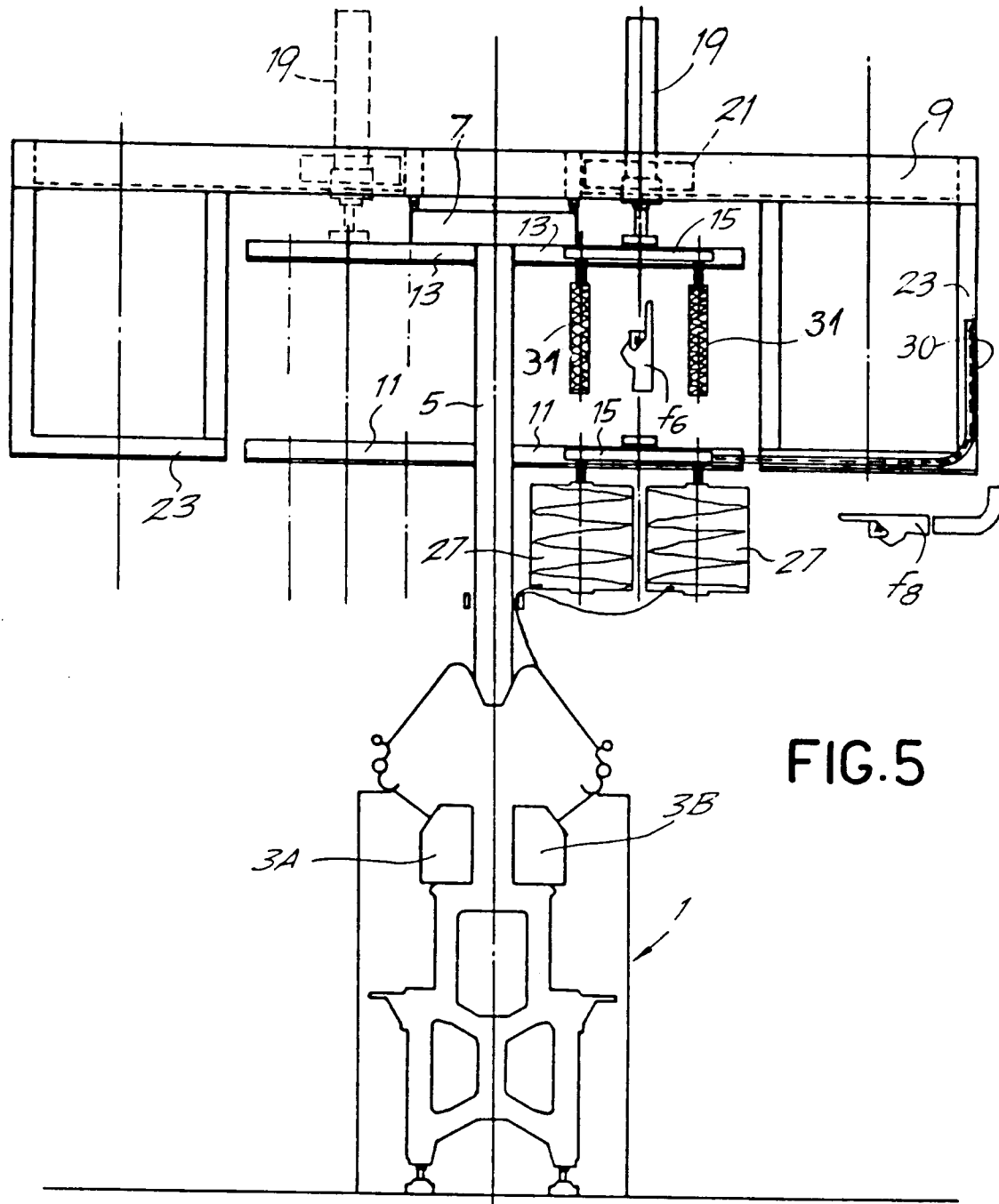
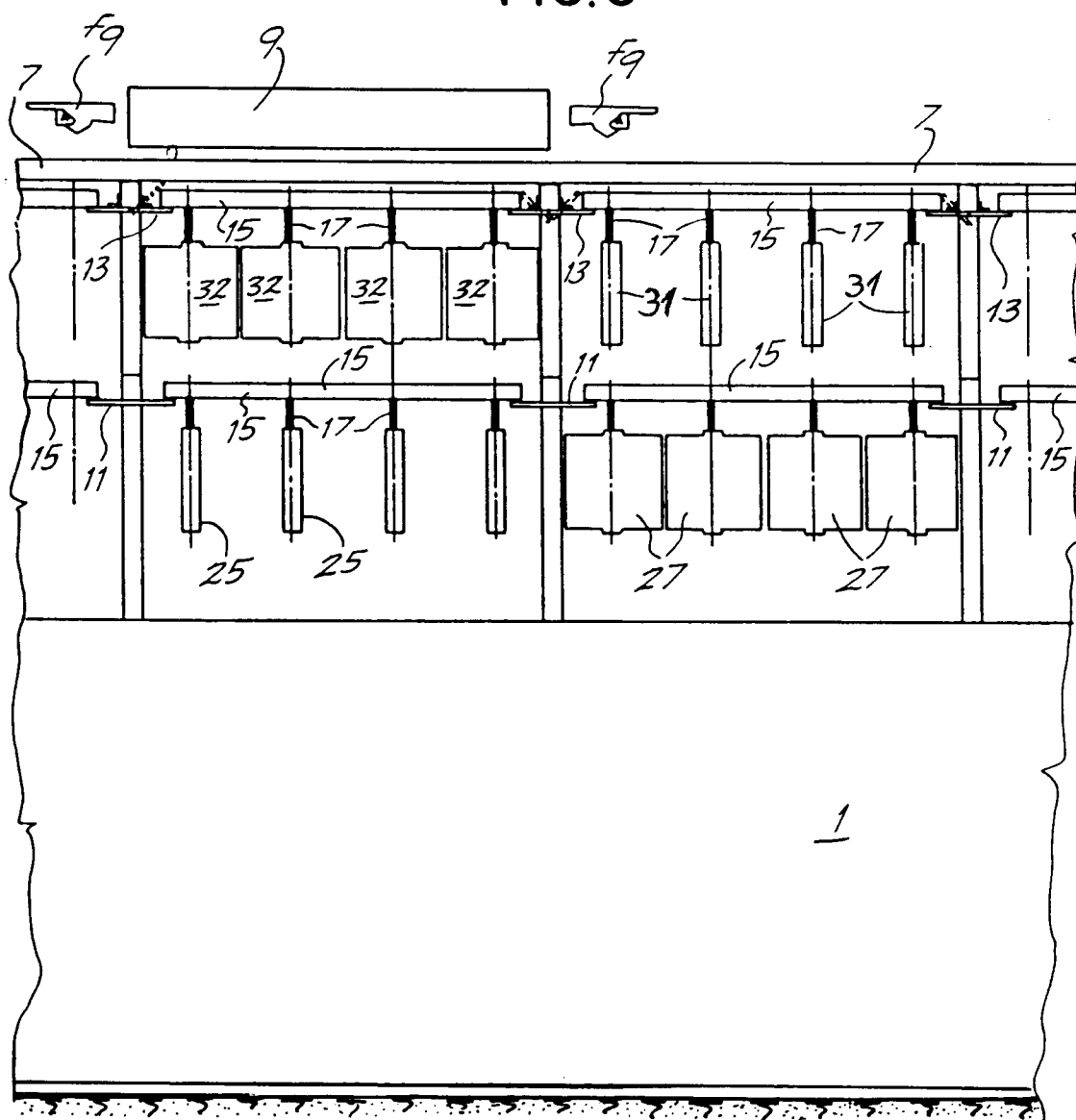
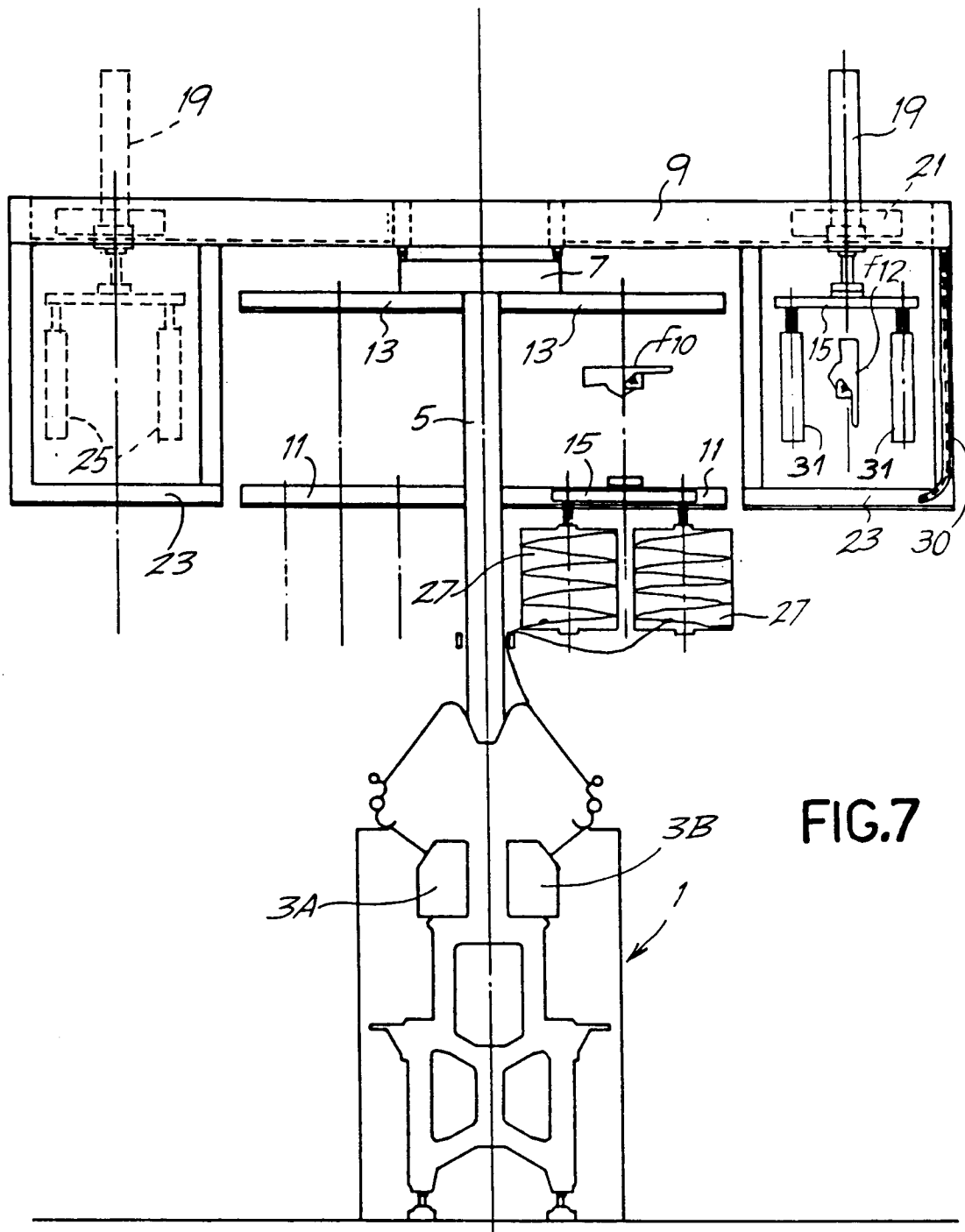


FIG.6





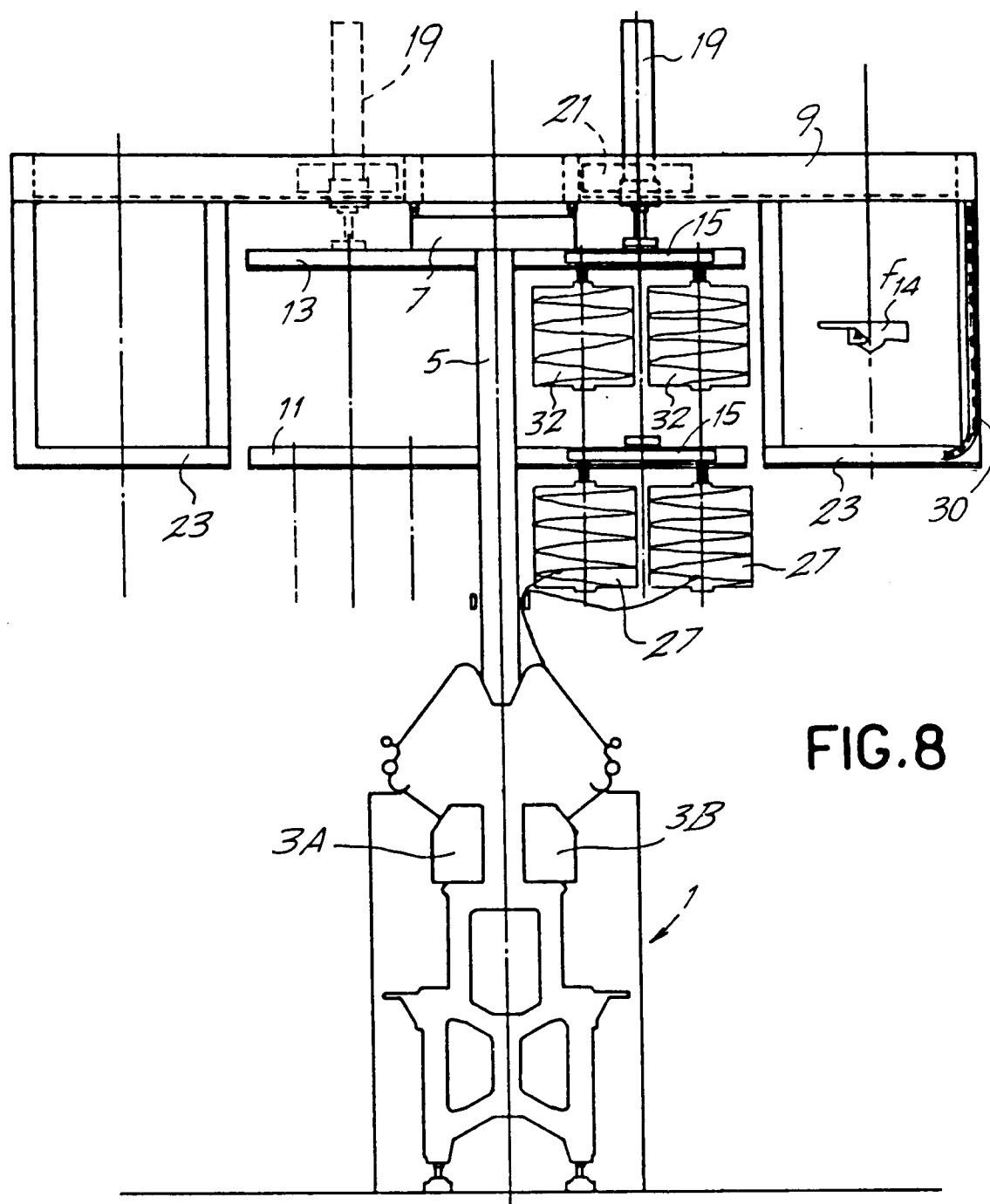


FIG.8