



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number:

0 452 687 A1

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **91104297.6**

(51) Int. Cl.⁵: **D01H 9/00, B65H 67/02**

(22) Date of filing: **20.03.91**

(30) Priority: **10.04.90 IT 8336290**

I-20149 Milano(IT)

(43) Date of publication of application:
23.10.91 Bulletin 91/43

(72) Inventor: **Brovelli, Loredana**
Via Monte Rosa 21
I-20149 Milano(IT)

(84) Designated Contracting States:
AT BE CH DE ES FR GB LI

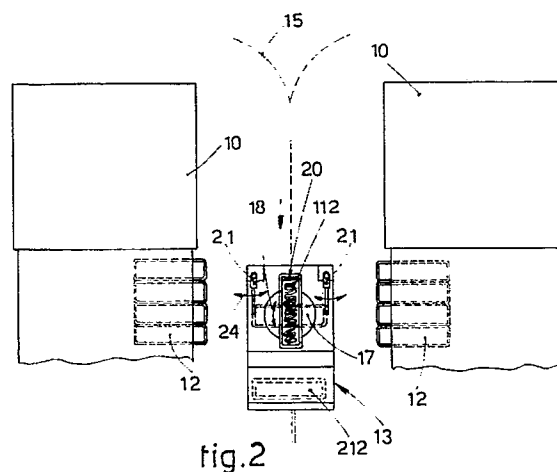
(71) Applicant: **Brovelli, Loredana**
Via Monte Rosa 21

(74) Representative: **Petraz, Gilberto Luigi**
GLP S.r.l. Piazzale Cavedalis 6/2
I-33100 Udine(IT)

(54) **Method for the automatic feed of cans of sliver to textile machines, and apparatus which employs such method.**

(57) Method for the automatic feed of cans (12) of sliver to textile machines and, in particular, to open-end spinning machines (10), the feed of cans (12) being carried out by movable means (13) able to move continuously and automatically between sliver production machines (11) and the textile machines, the movable means (13) being able to run along the sides of the spinning machines (10) or the required zones of other textile machines and being suitable to take action at the spinning units or other units requesting such action, the cans (12) to hold the sliver being advantageously of an elongate type with a rectangular horizontal section for instance, the method providing for the direct loading of full cans (112) of sliver onto the movable means (13) at the sliver production machines (11), the loading entailing a neutral positioning of the full cans (112) on the movable means (13) and the movement of the movable means (13) along paths (15) which comprise one single track between the sides or other zones of adjacent machines, the full cans (112), while being borne along this track, being oriented in a position suitable to feed one or the other of the sides or other zones of adjacent machines. Apparatus for the automatic feed of cans (12) of sliver to textile machines and, in particular, to open-end spinning machines (10), the feed of cans (12) being carried out by movable means (13) able to move continuously and automatically between sliver production machines (11) and the textile machines, the movable means (13) being able to run along the sides of the spinning

machines (10) or the required zones of other textile machines and being suitable to take action at the spinning units or other units requesting such action, the cans (12) to hold the sliver being advantageously of an elongate type with a rectangular horizontal section for instance, the apparatus employing the above method, the movable means (13) comprising means (17) which support in a neutral position and orient temporarily (18) the full cans (112) of sliver.



EP 0 452 687 A1

This invention concerns a method and an apparatus suitable to feed cans to textile machines. To be more exact the invention provides for the automatic feed of cans full of textile sliver to, and the automatic removal of empty cans from, textile machines and, in particular, spinning machines of the open-end type.

The invention concerns in particular, but not only, cans of an elongate type, namely cans having one dimension of their horizontal section greater than the other, such as the rectangular cans to which we shall refer as an example in the description which follows.

The state of the art has described the problems linked to the movement and positioning of cans holding slivers of fibres at the positions where the cans are to feed textile machines.

These textile machines may all be those which process slivers held in cans, such as fly frames, spinning machines and, in particular, the open-end spinning machines to which we shall refer as an example in the following description.

A plurality of solutions to overcome these problems has been suggested, particularly as regards the feed of open-end spinning machines. These solutions generally include trolleys which are linked to one or more spinning machines and which follow set paths in carrying full and/or empty cans from and/or to suitable temporary storage points for the cans.

The trolleys work at one machine side at a time along set paths and handle the normal round cans. Examples of these solutions are disclosed in WO-A-06358, FR-A-2.367,843, DE-A-3.440.598 and DE-A-3.505.494.

Solutions are also known whereby the trolleys serving the spinning machines are able to handle and fill empty cans with sliver at the spinning machine. For this purpose they carry a temporary stock of sliver and are equipped with appropriate devices to load the sliver into the emptied cans while spinning is proceeding.

Examples of these solutions are disclosed in EP-A-87202222.3 and EP-A-89105789.9.

The present applicant has the purpose of providing a method and relative apparatus suitable to handle full cans and empty cans, preferably of an elongate type, by placing them directly to feed a spinning machine or other textile machine or by removing them from their feed positions.

The invention is set forth in the main claims, while the dependent claims describe various features of the invention.

The invention arranges that one or more movable trolleys, the number of which depends on the spinning machines of which the plant consists, cooperate directly with sliver production machines such as drawing frames, for instance.

Each drawing frame fills with sliver elongate cans which, when filled, are loaded automatically onto movable trolleys for delivery to the spinning zone.

These elongate cans are loaded on the trolleys in a neutral position, as will be made clearer hereinafter, the end of the sliver being pre-positioned in a defined stationary position on the edge of each can.

After a full elongate can has been loaded, the trolley is sent on a path through the spinning machines.

The trolley can move automatically along preset paths and can be, for instance, of a type guided by a magnetic guide wire; it passes in one single direction between pairs of adjacent spinning machines. As it is equipped with means to communicate with spinning units requiring a change of feed, it turns the full can, in correspondence with those units, towards the side of the machine to which those units belong.

In other words the trolley of the invention during its passage can feed equally well either of the the contiguous spinning machines and can turn the full can towards either of those spinning machines.

After this orientation the can is unloaded from the trolley and positioned directly in correspondence with the spinning unit for which the can has been requested.

In this way the space required for the spinning machines can be considerably reduced since there is no longer any need for the usual double path of the trolley along each side of adjacent spinning machines.

The trolley is also provided with suitable means to withdraw and to load on the trolley the empty can to be removed, and the empty can is unloaded automatically thereafter at the drawing frames or at any desired collection station.

The trolley can also be equipped advantageously with means to engage the pre-positioned end of the sliver on the full can.

The end of the sliver can be brought to cooperate directly with the spinning unit in the automatic restarting of the relative spinning process.

The invention provides a working method and apparatus which are well adapted to present spinning requirements, particularly as regards open-end spinning machines fed from rectangular cans or cans of any other elongate shape.

Thence arise savings in plant costs and in the running of the plants owing to the simplicity and rational nature of the embodiments employed.

As we said earlier, the invention can be applied also to other cases relating to various machines that process sliver, for instance in the handling of cans between the drawing frames and the fly frames, and intermediate stations may also be in-

cluded for the storage of full and empty cans.

The attached figures, which are given as a non-restrictive example, show the following:

Fig.1

shows a lay-out of a spinning shop that employs the invention;

Fig.2

shows a plan view of a functional diagram of the apparatus of the invention;

Fig.3

is a side view of a trolley according to the invention;

Figs.4a and 4b

shows a type of elongate can which can be employed in the invention.

Fig.1 shows a possible lay-out of a spinning shop containing open-end spinning machines 10 and drawing frames 11.

Elongate cans 12 are filled with sliver in the drawing frames 11 and are removed therefrom on movable trolleys 13 which provide a secure connection between the open-end spinning machines 10 and drawing frames 11.

The movable trolleys 13, which are advantageously of the type guided by a magnetic guide wire, travel automatically along preset paths and can select a preferred path to suit the momentary requirements of the spinning machines 10.

A full can, bearing the reference 112, is loaded on the trolley 13 in a neutral or waiting position, as will be described better hereinafter.

The trolley 13 follows a path 14 connecting the drawing frame 11 to a main path 15 according to the arrow 16 and runs along a part or the whole of the first side of the first open-end spinning machine 10.

The full can 112 is positioned on the trolley 13 on top of a rotary platform 17, which can be actuated to rotate by 90° clockwise or anticlockwise according to the arrows 18 (see Figs.2 and 3).

The position called "neutral" of the full can 112 on the platform 17 is such that the can 112 is located at a right angle to the analogous cans 12 taking part in the processing on the spinning machines 10 while the trolley 13 is moving on the main paths 15.

The full can 112 is therefore ready, whether it is travelling on the segment of path outside the first spinning machine 10 or on the segment of path between the spinning machines 10 (see Fig.2), to be rotated in one direction or the other (position shown with lines of dashes in Fig. 2) according to the arrows 18 so as to meet the requirements for feed of a full can 112.

In this way there is only one path 15 for the trolley 13 to follow between the spinning machines 10, and this fact provides great advantages as regards the space taken up and the general run-

ning of the spinning shop.

The movable trolley 13 is equipped with at least one space to hold an empty can 212 taken from the spinning machines 10; this empty can 212 is advantageously positioned perpendicularly to the full can 112 when the latter is in its neutral position.

In configuration A of Fig.1 the trolley 13, when located at the drawing frames 11, holds a full can 112 in a neutral position but no empty can 212 when running according to the arrow 16, whereas if the trolley 13 is running in the opposite direction to the arrow 16, it will hold an empty can 212 but no full can 112.

In configuration B of Fig.1 the trolley 13 is working at a spinning unit; it has taken from this unit an empty can 212 and is preparing to rotate by 90° the full can 112 to the right or left as required to feed the full can 112 to the spinning unit.

In configuration C of Fig.1 a trolley 13 is travelling towards the zone of the drawing frames 11 and is carrying the only empty can 212 to be removed.

During its return to the zone of the drawing frames 11 the trolley 13 can run advantageously along direct return paths 19, which can be used equally well for its outward journey if it has to reach the farthest spinning machines 10 directly.

The trolley 13 is equipped preferably with means suitable to engage the end of the sliver 20 pre-positioned on the full can 112. Such means may be a pair of rotary and possibly telescopic arms 21 which bear a terminal gripper assembly 22.

Each rotary arm 21 is located at a lateral position on the trolley 13 so that it can descend vertically according to the arrow 23 to grip the end 20 of the sliver whether the full can 112 has been rotated to the right or the left.

Thereafter the arm 21 is rotated according to the arrows 24 and is possibly extended to take the end 20 of the sliver directly to a spinning unit which is to be restarted or to an automatic carriage which restarts the spinning and which is positioned, as is known, on the spinning machine 10.

Each arm 21 may bear, equally well, terminal assemblies 25 to discharge a full can 112 from the trolley 13. These discharge assemblies 25 descend vertically according to the arrow 23 to cooperate with the inner upper edge of the full can 112 and discharge the full can 112 thereafter from the trolley 13 by means of rotation of the arm 21 according to the arrows 24.

According to a variant one rotary arm alone 21 is provided and is located in a central position, advantageously on the rotary platform 17, and carries out discharge of the full can 112 either to the right or the left of the trolley 13.

The trolley 13 is also equipped with an assembly 26 to engage and handle empty cans 212; this

assembly 26 may be able to slide and extend and may be equipped advantageously with magnetic means capable of being coupled to analogous magnetic means 27 included on the cans 12.

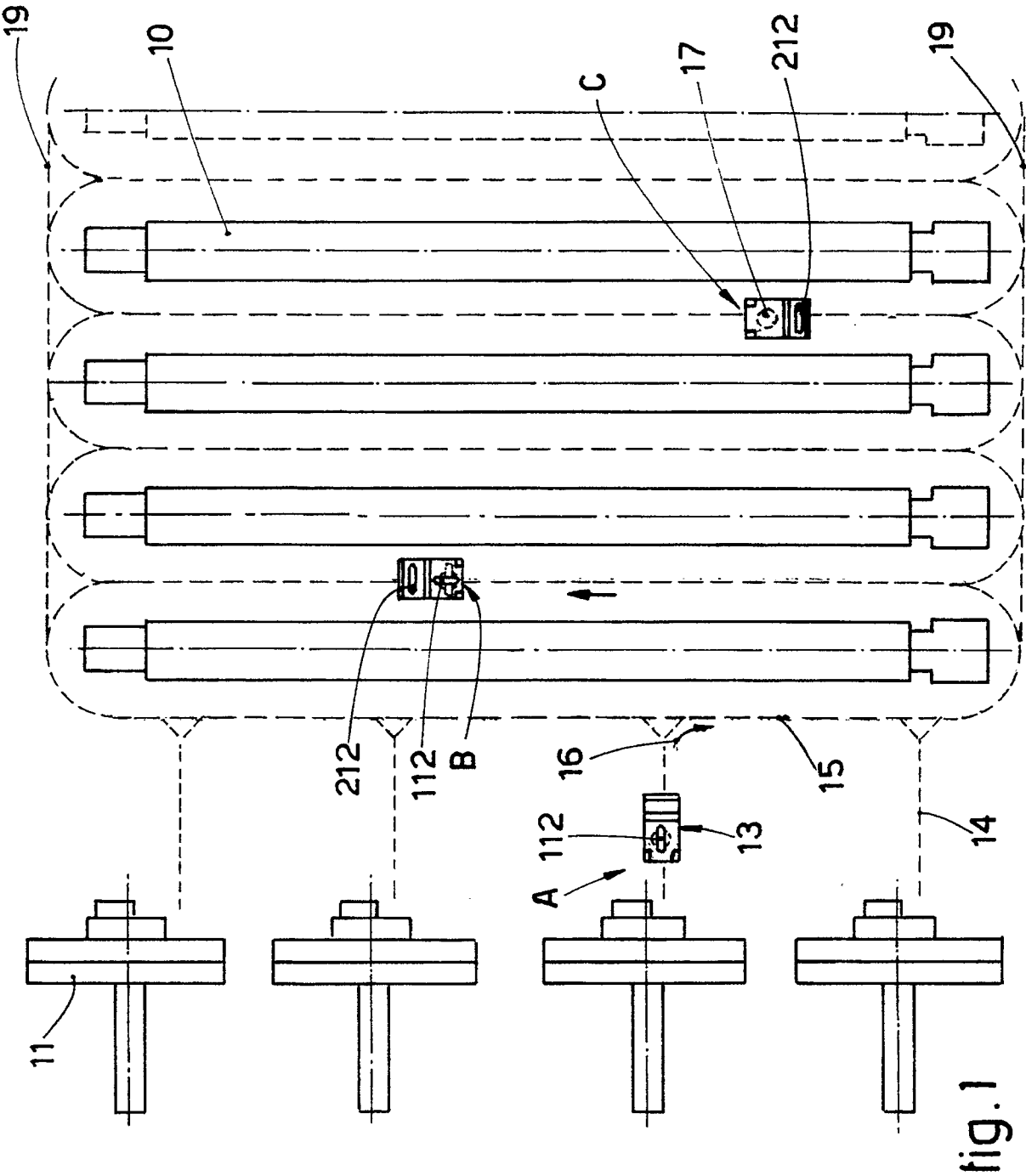
Fig.3 shows an assembly 28 which actuates and controls the functions cited above of the trolley 13.

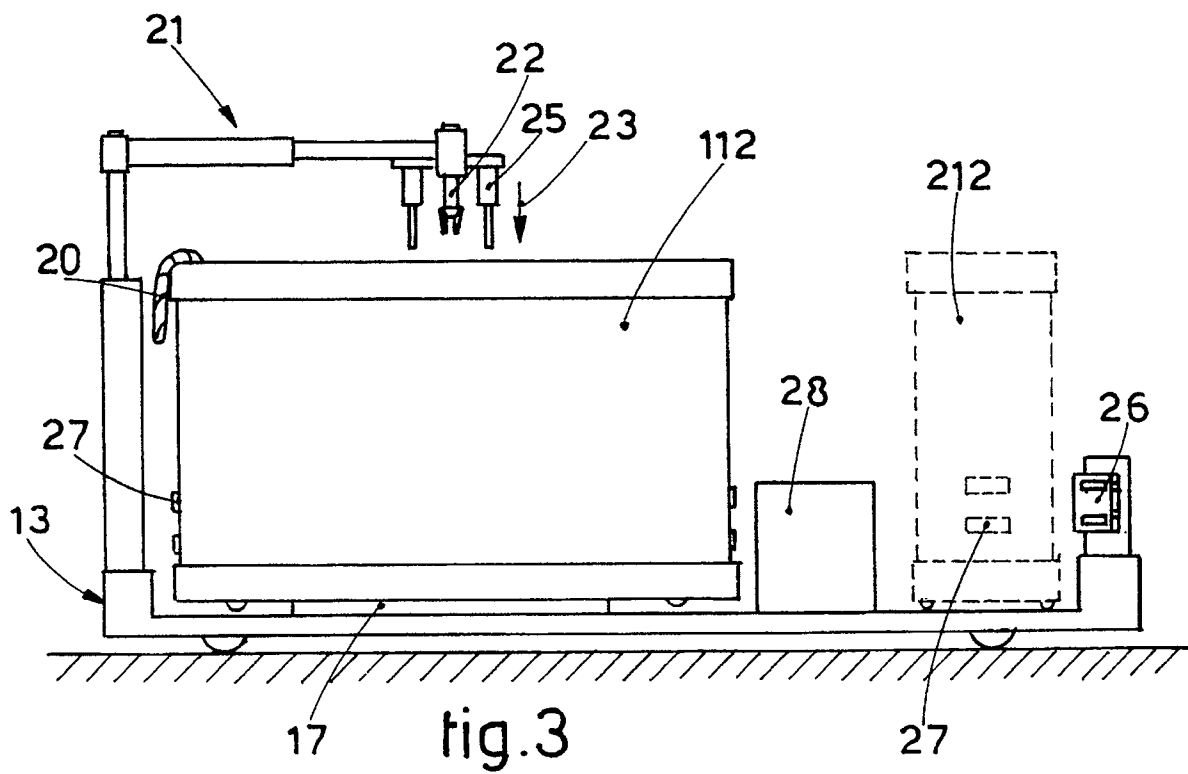
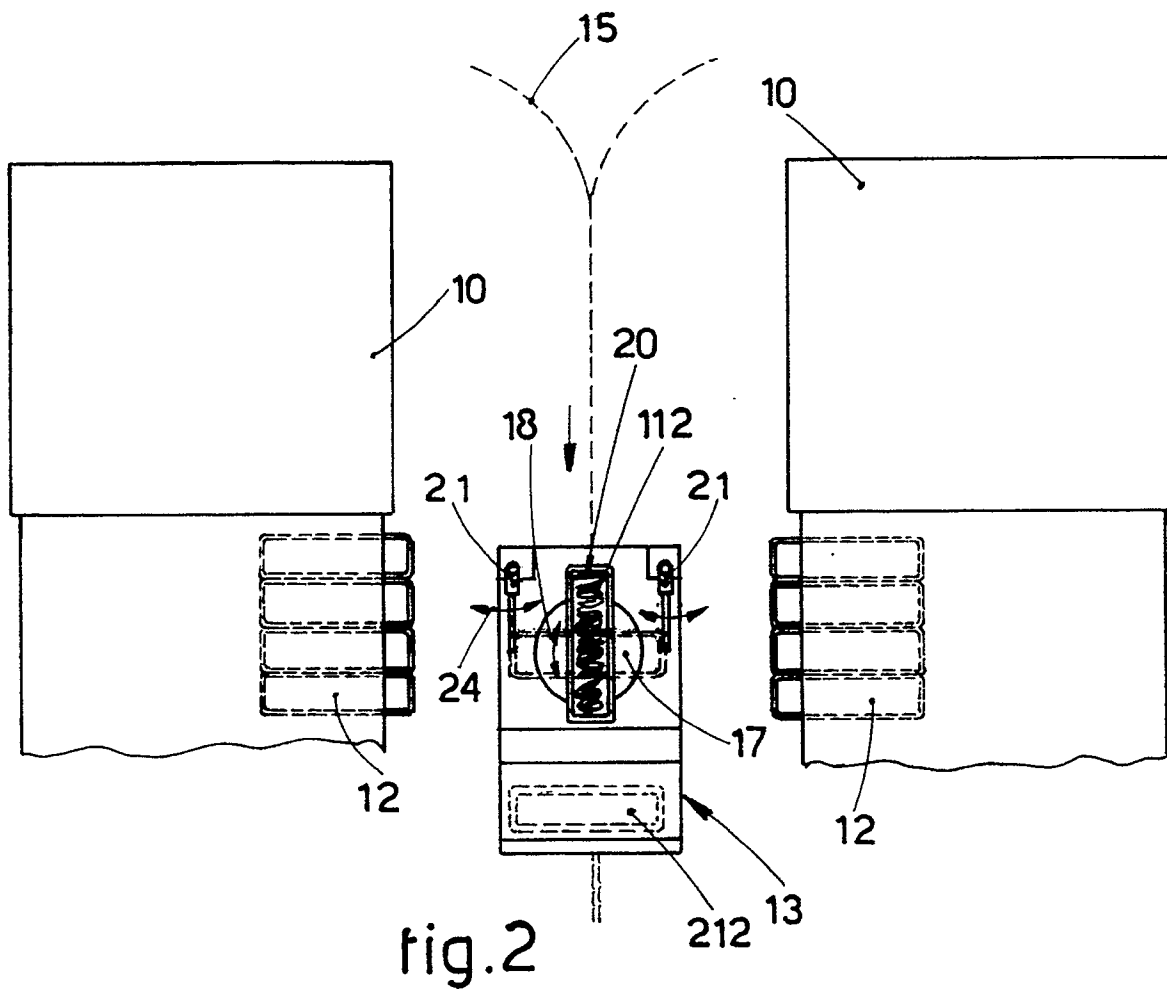
Figs.4a and 4b respectively show as an example a lengthwise section and a plan view of a known type of elongate can 12 which can be used with this invention. In this case the can 12 has a rectangular section and a movable bottom 29, which cooperates with springs 30 and with a pantograph-type balancing system 31.

We have described here a preferred embodiment of the invention, but variants are possible for a person skilled in this field, especially as regards devices to engage the end 20 of the sliver and to handle the cans 12, and also with regard to the general configuration of the trolley 13, without departing thereby from the scope of the invention as claimed.

Claims

1. Method for the automatic feed of cans (12) of sliver to textile machines and, in particular, to open-end spinning machines (10), the feed of cans (12) being carried out by movable means (13) able to move continuously and automatically between sliver production machines (11) and the textile machines, the movable means (13) being able to run along the sides of the spinning machines (10) or the required zones of other textile machines and being suitable to take action at the spinning units or other units requesting such action, the cans (12) to hold the sliver being advantageously of an elongate type with a rectangular horizontal section for instance, the method being characterized in that it provides for the direct loading of full cans (112) of sliver onto the movable means (13) at the sliver production machines (11), the loading entailing a neutral positioning of the full cans (112) on the movable means (13) and the movement of the movable means (13) along paths (15) which comprise one single track between the sides or other zones of adjacent machines, the full cans (112), while being borne along this track, being oriented in a position suitable to feed one or the other of the sides or other zones of adjacent machines.
2. Method as claimed in Claim 1, in which the full cans (112) of sliver are loaded onto the movable means (13) with the end (20) of the sliver pre-positioned.
3. Method as claimed in Claim 1 or 2, in which the pre-positioned end (20) of the sliver is engaged automatically on the movable means (13) and is brought into cooperation with the spinning unit or other textile unit requiring the sliver.
4. Method as claimed in any claim hereinbefore, in which the full can (112) of sliver is automatically discharged by the movable means (13).
5. Method as claimed in any claim hereinbefore, in which an empty can (212) taken from the relative spinning unit or other textile unit is loaded and unloaded by the movable means (13) automatically.
6. Apparatus for the automatic feed of cans (12) of sliver to textile machines and, in particular, to open-end spinning machines (10), the feed of cans (12) being carried out by movable means (13) able to move continuously and automatically between sliver production machines (11) and the textile machines, the movable means (13) being able to run along the sides of the spinning machines (10) or the required zones of other textile machines and being suitable to take action at the spinning units or other units requesting such action, the cans (12) to hold the sliver being advantageously of an elongate type with a rectangular horizontal section for instance, the apparatus employing the method of the claims hereinbefore and being characterized in that the movable means (13) comprise means (17) which support in a neutral position and orient temporarily (18) the full cans (112) of sliver.
7. Apparatus as claimed in Claim 6, in which the movable means (13) comprise at least one means (21-22) to engage and position the end (20) of the sliver.
8. Apparatus as claimed in Claim 6 or 7, in which the movable means (13) comprise means (25) to discharge the full can (112) of sliver.
9. Apparatus as claimed in any of Claims 6, 7 or 8, in which the movable means (13) comprise a lodgement for empty cans (212).
10. Apparatus as claimed in any of Claims 6 to 9 inclusive, in which the movable means (13) comprise means (26) to handle the empty cans (212).





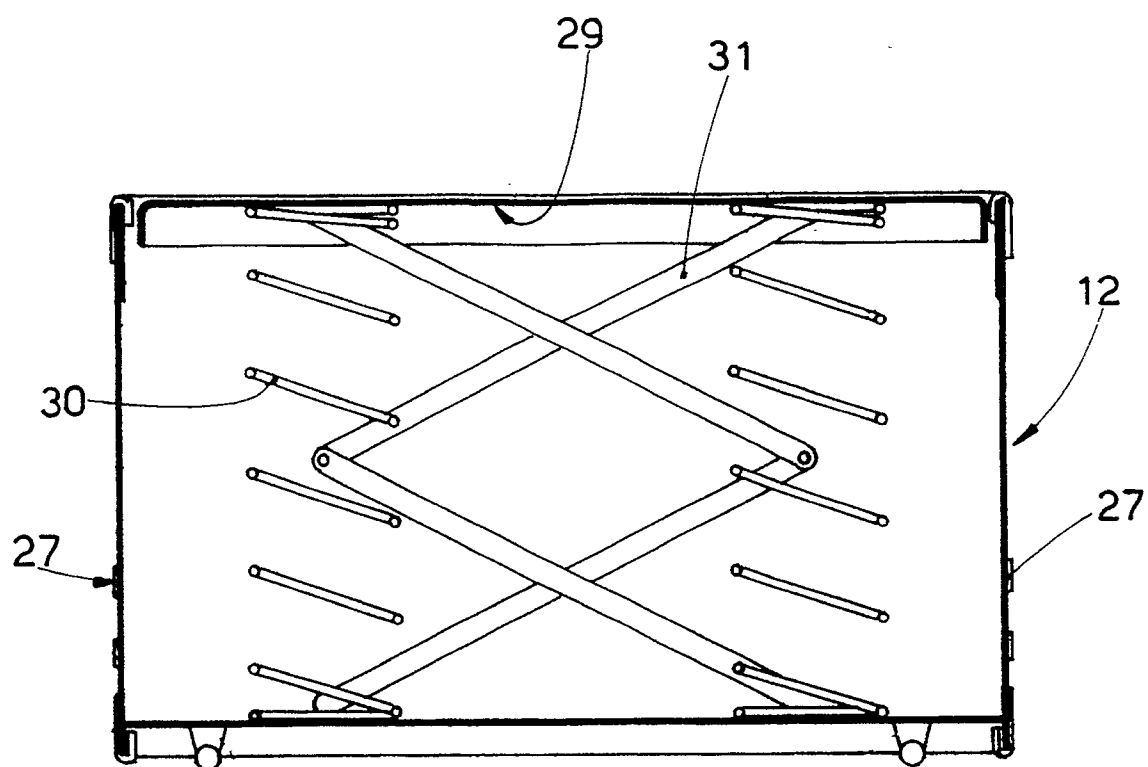


fig.4a

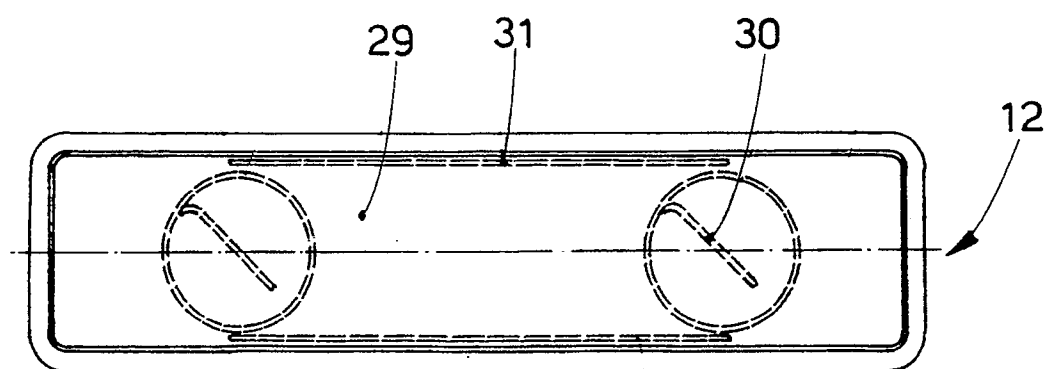


fig.4b



European
Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 10 4297

DOCUMENTS CONSIDERED TO BE RELEVANT					
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)		
A,D	DE-A-3 440 598 (STAHLECKER et al.) * Figures * -- --	1,6	D 01 H 9/00 B 65 H 67/02		
A,D	DE-A-3 505 494 (LANGEN) * Figures * -- --	1,6			
A,D	WO-A-8 606 358 (BURO PATENT) * Figures * -- --	1,6			
A,D	FR-A-2 367 843 (SCHLAFHORST) * Figures 1,10,11,14 * -- --	1,6			
A,D	EP-A-0 340 459 (M. SCAGLIA) * Figures * -- --	1,6			
A	GB-A-2 171 121 (W. REINERS) * Figures * -- -- --	1,6			
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)		
			D 01 H B 65 H		
The present search report has been drawn up for all claims					
Place of search The Hague		Date of completion of search 15 July 91	Examiner RAYBOULD B.D.J.		
<table border="0"><tr><td>CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention</td><td>E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</td></tr></table>				CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention	E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention	E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document				