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**(54) DEVICE AND METHOD FOR MAKING A CORE YARN**

VORRICHTUNG UND VERFAHREN ZUR HERSTELLUNG EINES KERNGARNS

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(56) References cited:  
**EP-A1- 0 753 613 EP-A1- 2 006 422**  
**WO-A1-2008/068294 JP-A- 1 033 229**  
**JP-A- 2 234 935**

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**EP 2 452 002 B1**

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**Description****FIELD OF THE INVENTION**

**[0001]** The present invention relates to a device and a method for making a core yarn according to the preamble of the patent claims.

**BACKGROUND OF THE INVENTION**

**[0002]** Devices for making core yarns are known since many years and are mainly directed to the making of a yarn with an elastic core filament.

**[0003]** US2024156 and US2210884 were assigned to the United States Rubber Company and were published on 17<sup>th</sup> December 1935 and 13<sup>th</sup> August 1940. Both publications are directed to methods for making an elastic yarn. The method describes how a core filament is introduced into a ring spinning process before the delivery rollers of a drawing unit and a cover of textile fibers is spun about the core filament.

**[0004]** FR1449645 of Les Filatures du Srtel Felix Watine et Fils was published on 6<sup>th</sup> May 1966 and discloses a device for making a core yarn. A bobbin of a core filament is arranged on two parallel unrolling cylinders. The core filament is unrolled from the bobbin around one of the unrolling cylinders and then bypasses a deflection pulley before it is introduced into a ring spinning process by the delivery rolls of a drafting unit.

**[0005]** DE19501163 was filed in the name of Zinser Textilmaschinen GmbH and published on 18<sup>th</sup> April 1996. DE'163 describes a drawing unit with a guiding unit for feeding a core filament. The drawing unit has a sliver guide with a reciprocating side movement before the entry of the sliver into the final pair of drawing rollers. The sliver guide is combined with a guide for a core yarn, into a one-piece guide unit. The combined guide is moved sideways by a reciprocating drive.

**[0006]** From the same applicant a device for making core yarn is known, which has been on the market for several years. The system comprises two unrolling cylinders which are arranged above the spindles in the length direction of the spinning machine. The two unrolling cylinders are arranged on the same level behind each other and are suitable to carry bobbins with a core filament. The core filament is unwound from the bobbins around one of the unrolling cylinders and is then deflected by a sensor pulley, which electronically monitors contactless the presence of the core filament. If no core filament is present, the spinning process for the affected spindle is halted. For each spindle, a sensor pulley is present which is arranged at an arm that can be pivoted upward. The core filament is deflected by the sensor pulley, which is arranged above a pair of delivery rolls of a drawing unit. After the core filament has passed the sensor pulley, it is introduced into the spinning process by the respective pair of delivery rolls.

**[0007]** US2006179810A in the name of Invista North

America S.A.R.L was published on 17 August 2006 and discloses polyester bicomponent core spun yarn, which comprises a sheath of at least one hard fibre and a core of bicomponent polyester filament. This product is known under the brand name "T-400" and behaves like a non-elastic (hard) fibre during the spinning process, but becomes elastic after processing by a temperature treatment. Thereby, it is possible to make bidirectional stretchable garments and fabrics. Although the T-400-fibres are of the core yarn type, the devices for making core yarns are only limited suitable for the spinning of T-400-fibres, since they act like hard fibres and become elastic by a subsequent activation after the weaving process.

**[0008]** EP2006422 was filed in the name Central Textiles (HK) Limited on 21 August 2007 and discloses an apparatus for making a core yarn which comprises a bicomponent polyester filament and an elastomeric fiber. The patent application shows in a very principle manner different embodiments of a core spinning apparatus where the sources for filaments or fibers are mounted on a pair of driven unrolling cylinders. In one embodiment a source of a bi-component filament and a source of an elastomeric fiber are each one arranged on a pair of unrolling cylinders.

**[0009]** WO08068294 was filed on 5th December 2007 on behalf of Amsler Tex AG and discloses a device and a method for supplying flames to ring spinning machines. In one embodiment, per spinning unit one bobbin provides the core filaments. Two bobbins are arranged behind each other each supported by lateral spacers and held by a bearing shaft. Each bobbin is driven by a single unrolling cylinder.

**[0010]** A further problem inherent to the known devices is that they are not suitable for handling bobbins having a larger size.

**SUMMARY OF THE INVENTION**

**[0011]** One object of the herein disclosed invention is to provide an improved device for the making of core yarns. A further object of the invention is to provide a device, which is capable in handling larger bobbins and non-elastic core filaments. Still a further object of the invention is to provide a system which is more user friendly.

**[0012]** When processing core yarns having a hard (non-flexible) filament at the inside on a ring spinning machine, the problem may occur that the size of the filament bobbin and other parameters have a negative impact on the resulting yarn quality, because an angular dependent oscillating tension in the core filament occurs during unrolling. Especially with bobbins exceeding a certain length, the filament travels along the bobbin during unrolling a significant distance although the deflection roller receiving the filament remains stationary. As a result thereof, the "free length" of the filament between the unrolling cylinder/ bobbin and the subsequent deflection roller changes in an oscillating manner. Especially with a hard (non-elastic) core filament and a disadvantageous

arrangement of the deflection roller, this may have a negative impact on the spinning process. This effect is less severe or does not have a negative impact in the case that bobbins with a smaller diameter and/or length are used or the core filament has a certain elasticity. The present invention overcomes this problem by a special arrangement of deflection rollers in addition to and separated from the unrolling cylinders, which carry the bobbin with the core filament.

**[0013]** In the devices known from prior art, the bobbins for the core filament are arranged in a single row lateral to each other. Their maximum length is thereby limited by the distance between the spindles of the respective ring spinning device and spacers arranged in between. Due to that, their capacity is limited, which results in a more often exchange. Other attempts have been undertaken to arrange the reservoir of the core filament high above the spinning frame. However problems with the blower and during handling are quite likely. In addition, it is often necessary to stop the spinning process because otherwise it would not be possible to handle the heavy bobbins.

**[0014]** This problem is overcome by an embodiment of the invention by an improved storage system for the bobbins with the core filament. The storage system according to said embodiment of the invention comprises two pairs of unrolling cylinders, which are arranged behind each other offering several advantages with respect to the size of the bobbins and their handling. In that two bobbins are arranged behind each other, it becomes possible to make each bobbin larger and thereby more ample, which results in an improved durability and therefore less maintenance is needed. In that this storage system is combined by a special arrangement of deflection rollers, it is possible - beside elastic filaments - to process hard (non-elastic) filaments in a very effective manner. Depending on the field of application, it is also possible to use the storage system to process normal core filament bobbins.

**[0015]** In an embodiment per spindle a first and a second deflection roller are arranged spaced a distance apart from one another, deflecting the core filament twice before it is introduced into the spinning process thereby effectively influencing/reducing the occurring oscillation of the tension in the filament, which results from the oscillating lateral travelling of the filament during unrolling. Depending on the field of application, a first deflection roller is arranged in a region in above (or in front) of an upper delivery roller of a drawing unit and the second deflection roller is arranged in horizontal direction behind and above the first deflection roller directly or indirectly receiving the filament unrolled from the bobbins. Good results are achievable if the first and the second deflection roller are arranged during operation at a constant distance from each other. The deflection rollers may be arranged stiff or deflectable against the force of a spring or a counter weight. If appropriate, at least one deflection roller may be replaced by another deflection means.

**[0016]** To improve the handling of larger bobbins with the core filament, the invention may foresee an improved supporting structure and arrangement for bobbins having a significantly larger diameter compared to the prior art. Still, the supporting structure can be designed for smaller bobbins, if required. If necessary, spacers for several types of bobbins may be foreseen. The spaces may be arranged pivotable about an axis such that they can be easily removed when not required.

**[0017]** In an embodiment the core ring yarn spinning machine comprises a first and a second pair of driven unrolling cylinders. The first and the second pair of unrolling cylinders are arranged in horizontal direction behind and spaced a distance apart from each other each pair suitable to receive a bobbin of core filament. Per bobbin a first deflection roller separated from the unrolling cylinders deflects the core filament unrolled from the bobbin before it is entered into the spinning process of a spindle via a delivery roller of a drawing unit. If required, a second deflection roller is arranged between the first deflection roller and the unrolling cylinders deflecting the filament a second time thereby reducing the influence of negative oscillations within the tension of the core filament. Good results are achieved, if the first deflection roller is arranged above the delivery roller of the drawing unit. The second delivery roller may be arranged above an entry roller of the drawing unit. If required, one of the deflection rollers may be arranged displaceable. One of the deflection rollers may be interconnected with means to determine the presence of the core filament, e.g. an electronic sensor. If required, at least one of the deflection rollers may be interconnected with means to stop the spinning process of a dedicated spindle, e.g. in that the supply of a roving is stopped. Normally, the first and the second pair of unrolling cylinders are arranged vertically on the same level with respect to each other. However, other arrangements are possible as long as the functionality is not affected. The first and the second pair of unrolling cylinders are driven in the same direction with respect to each other such that a bobbin of core filament can be rolled over from the first to the second pair of unrolling cylinders without halting the spinning process.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0018]** The herein described invention will be more fully understood from the detailed description given herein below and the accompanying drawings which should not be considered limiting to the invention described in the appended claims. The drawings are showing:

- Fig. 1 an embodiment of the invention in a perspective view;
- Fig. 2 details of the embodiment according to Figure 1 in a magnified manner;
- Fig. 3 the embodiment of Figure 1 in a side view;

Fig. 4 the embodiment according to Figure 2 in a front view.

## DESCRIPTION OF THE EMBODIMENTS

**[0019]** Figure 1 shows a first embodiment of a device 1 according to the present invention in a perspective view. Figure 2 shows details of the embodiment according to Figure 1 in a magnified manner. Figure 3 shows the device according to Figure 1 in a side view. Figure 4 shows the embodiment according to Figure 2 in a front view.

**[0020]** The device 1 comprises two pairs of unrolling cylinders 2.1, 2.2, which serve to carry the core filament bobbins (bobbins) 3.1, 3.2 and to unroll a core filament (filament) 10 from the bobbins 3.1, 3.2. In difference to the devices known from prior art, the herein shown device is suitable to handle and process larger bobbins 3, which have a length e.g. in the range of approximately 90 mm to 150 mm and a diameter of approximately 100 mm to 300 mm. Other dimensions are possible depending on the field of application. Spacers 4 are arranged between the bobbins 3 avoiding that the bobbins interact during operation. The unrolling cylinders 2.1, 2.2 are in a vertical direction (z-axis) arranged between the drawing units 5 mounted on a ring spinning frame 6 and the flyer spools 7, which are hanging on a creel 8.

**[0021]** As it can be seen best in Figure 3, the unrolling cylinders 2.1, 2.2 are in horizontal direction (y-axis) arranged behind each other on the same level and supported by a supporting rack 15, which is interconnected to the spinning frame 6. Depending on the field of application, a difference in vertical position is acceptable as long as the functionality does not suffer.

**[0022]** In the shown embodiment, the pair of unrolling cylinders 2.1 in the front (right hand side) and the pair of unrolling cylinders 2.2 in the rear of the machinery (left hand side) are both driven clockwise with respect to the view of Figure 3 such that the respective bobbins 3.1, 3.2 are rotating counter clockwise around their length axis (x-axis). While the filament 10 of the front bobbins 3.1 is unwound directly from the bobbin without contact to the associated unrolling cylinder 2.1, the filament 10 of the rear bobbin is unwound around one of the second unrolling cylinders 2.2. One advantage is that the front bobbin 3.1 can easily be rolled over to the rear position without the need to stop and start spinning of the respective spindle. This becomes important when the rear bobbin 3.2 is empty and must be replaced. In the devices known from the prior art, it is very difficult to exchange an empty bobbin without stopping additional spindles. If necessary, additional means to guide the filament can be foreseen.

**[0023]** The spacers 4 of the shown embodiment are fastened to two supporting rods 9 arranged between the front and the rear unrolling cylinders 2.1, 2.2. The supporting rods of the shown embodiment are arranged such that they do not hinder the rolling over of the bobbin 3.1 from the front to the rear position, e.g. by disturbing the

unrolling filament during the spinning process. Depending on the field of application other arrangements are possible as long as the functionality is not constrained. If the rolling over is not necessary, it is also possible to unroll the front and the rear bobbin 3.1, 3.2 over the respective unrolling cylinder 2.1, 2.2. The driving directions of the unrolling cylinders are adopted respectively.

**[0024]** Figure 4 shows the embodiment according to Figure 2 in a front view. The bobbins 3.1, 2.1 are arranged behind each other on the allocated unrolling cylinders 2.1, 2.2. Because of the viewing direction, only the front bobbin 3.1 and the front pair of unrolling cylinders 2.1 are visible. The lateral travelling of the filaments 10 during unrolling is indicated by arrows 16. The maximum deflection normally occurs at the upper end. At the lower end in the area of the deflection rollers, the lateral movement is given by the drawing unit, which may have a sliver guide with a reciprocating side movement. If not present, the side movement is at the lower end zero.

**[0025]** The first deflection rollers 13 are attached to an arm 17, which is arranged above the drawing unit 5 and which is fixed pivotable in upward direction to a fixation beam 19 via a base element 18. The second deflection rollers 14 are in the herein shown embodiment fastened to a holder 20, which is also attached to the fixation beam 19. In the shown embodiment, the first and the second deflection rollers 13, 14 are in the spinning process arranged immovable with respect to each other. Depending on the field of application, e.g. to process less critical filaments, it is possible to avoid the second deflection rollers 14.

## LIST OF DESIGNATIONS

### [0026]

1	Device for making core yarn
2.1	Unrolling Cylinders Front
2.2	Unrolling Cylinders Back
3.1	Front Bobbins
3.2	Rear Bobbins
4	Spacer (between Bobbins)
5	Drawing Unit
6	Ring Spinning Frame
7	Flyer Spool
8	Creel
9	Supporting Rod
10	Filament
11	Delivery Roller
12	Entry Roller
13	First Deflection Roller
14	Second Deflection Roller
15	Supporting Rack
16	Arrow indicating lateral travelling of filament
17	Arm
18	Base Element
19	Fixation Beam
20	Holder

## Claims

### 1. A core yarn ring spinning machine comprising:

a. a first and a second pair of driven unrolling cylinders (2.1, 2.2), the first and the second pair of unrolling cylinders (2.1, 2.2) are arranged in horizontal direction (Y) behind and spaced a distance apart from each other each pair suitable to receive a bobbin of core filament (3.1, 3.2),

#### characterized in that

b. the first and the second pair of unrolling cylinders (2.1, 2.2) are in a vertical direction (z) arranged between a drawing unit (5) mounted on a ring spinning frame (6) and a creel (8) for hanging flyer spools (7) thereon;

c. the first and the second pair of unrolling cylinders (2.1, 2.2) are supported by a supporting rack (15) which is interconnected to the ring spinning frame (6);

d. per bobbin (3.1, 3.2) a first deflection roller (13) is arranged between the unrolling cylinders (2.1, 2.2) and a delivery roller (11) of the drawing unit (5) to deflect a core filament (10) unrolled from the bobbin of core filament (3.1, 3.2) before it is entered into the spinning process of a spindle via the delivery roller (11);

e. the first and the second pair of unrolling cylinders (2.1, 2.2) are driven in the same direction with respect to each other such that a bobbin of core filament (3.1, 3.2) can be rolled over from the first to the second pair of unrolling cylinders (2.1, 2.2) without halt of the spinning process.

### 2. The device (1) according to claim 1, **characterized in that** the first deflection roller (13) is arranged above the delivery roller (11) of the drawing unit (5).

### 3. The device (1) according to one of the previous claims, **characterized in that** a second deflection roller (14) is arranged between the first deflection roller (13) and the first and the second pair of unrolling cylinders (2.1, 2.2).

### 4. The device (1) according to claim 3, **characterized in that** the second deflection roller (14) is arranged above an entry roller (12) of the drawing unit (5).

### 5. The device (1) according to one of the previous claims, **characterized in that** at least one of the deflection rollers (13, 14) is arranged displaceable.

### 6. The device (1) according to claim 5, **characterized in that** at least one deflection roller (13, 14) is arranged deflectable against the force of a spring or a counter weight.

7. The device (1) according to one of the previous claims, **characterized in that** at least one of the deflection rollers (13, 14) is interconnected with means to determine the presence of the core filament (10).

8. The device (1) according to claim 7, **characterized in that** at least one of the deflection rollers (13, 14) is interconnected with means to stop the spinning process of a dedicated spindle.

9. The device (1) according to one of the previous claims, **characterized in that** the first and the second pair of unrolling cylinders (2.1, 2.2) are arranged in vertical direction (z) on the same level with respect to each other.

10. The device (1) according to one of the previous claims, **characterized in that** two bobbins of a core filament (3.1, 3.2) arranged behind (y) each other are separated in direction of the bobbins' rotational axis (x) from a neighbouring bobbin of core filament (3.1, 3.2) by a common spacer (4).

11. The device (1) according to claim 10, **characterized in that** the spacer (4) is fastened to two supporting rods (9), each supporting rod (9) being arranged between the unrolling cylinders (2.1, 2.2) of a pair of unrolling cylinders (2.1, 2.2).

## Patentansprüche

### 1. Kerngarn-Ringspinnapparat, der umfasst:

a. ein erstes und ein zweites Paar von angetriebenen Abwickelzylindern (2.1, 2.2), wobei das erste und das zweite Paar von Abwickelzylindern (2.1, 2.2) in horizontaler Richtung (y) hintereinander angeordnet und um eine Distanz voneinander beabstandet sind, wobei sich jedes Paar dazu eignet, eine Spule von Kernfilament (3.1, 3.2) aufzunehmen,

#### dadurch gekennzeichnet, dass

b. das erste und das zweite Paar von Abwickelzylindern (2.1, 2.2) in einer vertikalen Richtung (z) vorliegen, angeordnet zwischen einem Streckwerk (5), das auf einer Ringspinnmaschine (6) angebracht ist, und einem Gatter (8) zum Anhängen von Flyerspulen (7);

c. das erste und das zweite Paar von Abwickelzylindern (2.1, 2.2) von einem Trägergestell (15) gestützt werden, das mit der Ringspinnmaschine (6) verbunden ist;

d. pro Spule (3.1, 3.2) eine erste Umlenkrolle (13) zwischen den Abwickelzylindern (2.1, 2.2) und einer Ablieferrolle (11) des Streckwerks (5)

- angeordnet ist, um ein Kernfilament (10) umzulenken, das von der Spule von Kernfilament (3.1, 3.2) abgewickelt wurde, bevor es in den Spinnprozess einer Spindel über die Zuführolle (11) eintritt;
- e. das erste und das zweite Paar von Abwickelzylindern (2.1, 2.2) in Bezug aufeinander in der gleichen Richtung angetrieben werden, so dass eine Spule von Kernfilament (3.1, 3.2) ohne Unterbrechung des Spinnprozess vom ersten auf das zweite Paar von Abwickelzylindern (2.1, 2.2) geführt werden kann.
2. Vorrichtung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die erste Umlenkrolle (13) über der Ablieferrolle (11) des Streckwerks (5) angeordnet ist.
3. Vorrichtung (1) nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** eine zweite Umlenkrolle (14) zwischen der ersten Umlenkrolle (13) und dem ersten und dem zweiten Paar von Abwickelzylindern (2.1, 2.2) angeordnet ist.
4. Vorrichtung (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** die zweite Umlenkrolle (14) über einer Eintrittsrolle (12) des Streckwerks (5) angeordnet ist.
5. Vorrichtung (1) nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** zumindest eine der Umlenkwalzen (13, 14) verschiebbar angeordnet ist.
6. Vorrichtung (1) nach Anspruch 5, **dadurch gekennzeichnet, dass** zumindest eine Umlenkrolle (13, 14) gegen die Kraft einer Feder oder eines Gegengewichts umlenkbar angeordnet ist.
7. Vorrichtung (1) nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** zumindest eine der Umlenkrollen (13, 14) mit einem Mittel wirkverbunden ist, um das Vorhandensein des Kernfilaments (10) zu bestimmen.
8. Vorrichtung (1) nach Anspruch 7, **dadurch gekennzeichnet, dass** zumindest eine der Umlenkrollen (13, 14) mit einem Mittel wirkverbunden ist, um den Spinnprozess eines dedizierten Spindel zu stoppen.
9. Vorrichtung (1) nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das erste und das zweite Paar von Abwickelzylindern (2.1, 2.2) in einer vertikalen Richtung (z) in Bezug aufeinander auf der gleichen Höhe angeordnet sind.
10. Vorrichtung (1) nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** zwei Spulen eines Kernfilaments (3.1, 3.2), die hinterein-

ander (y) angeordnet sind, in Richtung der Drehachse (x) der Spulen durch einen gemeinsamen Abstandhalter (4) von einer benachbarten Spule eines Kernfilaments (3.1, 3.2) beabstandet sind.

11. Vorrichtung (1) nach Anspruch 10, **dadurch gekennzeichnet, dass** der Abstandhalter (4) an zwei Trägerstangen (9) befestigt ist, wobei jede Stützstange (9) zwischen den Abwickelzylindern (2.1, 2.2) eines Paares von Abwickelzylindern (2.1, 2.2) angeordnet ist.

## Revendications

1. Filature à anneaux de fils à âme comprenant :

a. une première et une deuxième paire de cylindres à déroulement actionnés (2.1, 2.2), la première et la deuxième paire de cylindres à déroulement (2.1, 2.2) étant disposées en direction horizontale (y) derrière et espacées d'une certaine distance les uns des autres, chaque paire convenant à recevoir une bobine de filament à âme (3.1, 3.2),

### caractérisée en ce que

b. la première et la deuxième paire de cylindres à déroulement (2.1, 2.2) sont dans une direction verticale (z) arrangées entre un banc d'étirage (5) monté sur un métier à tisser à anneaux (6) et un cantre (8) pour y suspendre des bobines de banc à broches (7) ;

c. la première et la deuxième paire de cylindres à déroulement (2.1, 2.2) sont supportés par un châssis support (15) qui est interconnecté au métier à filer à anneaux (6) ;

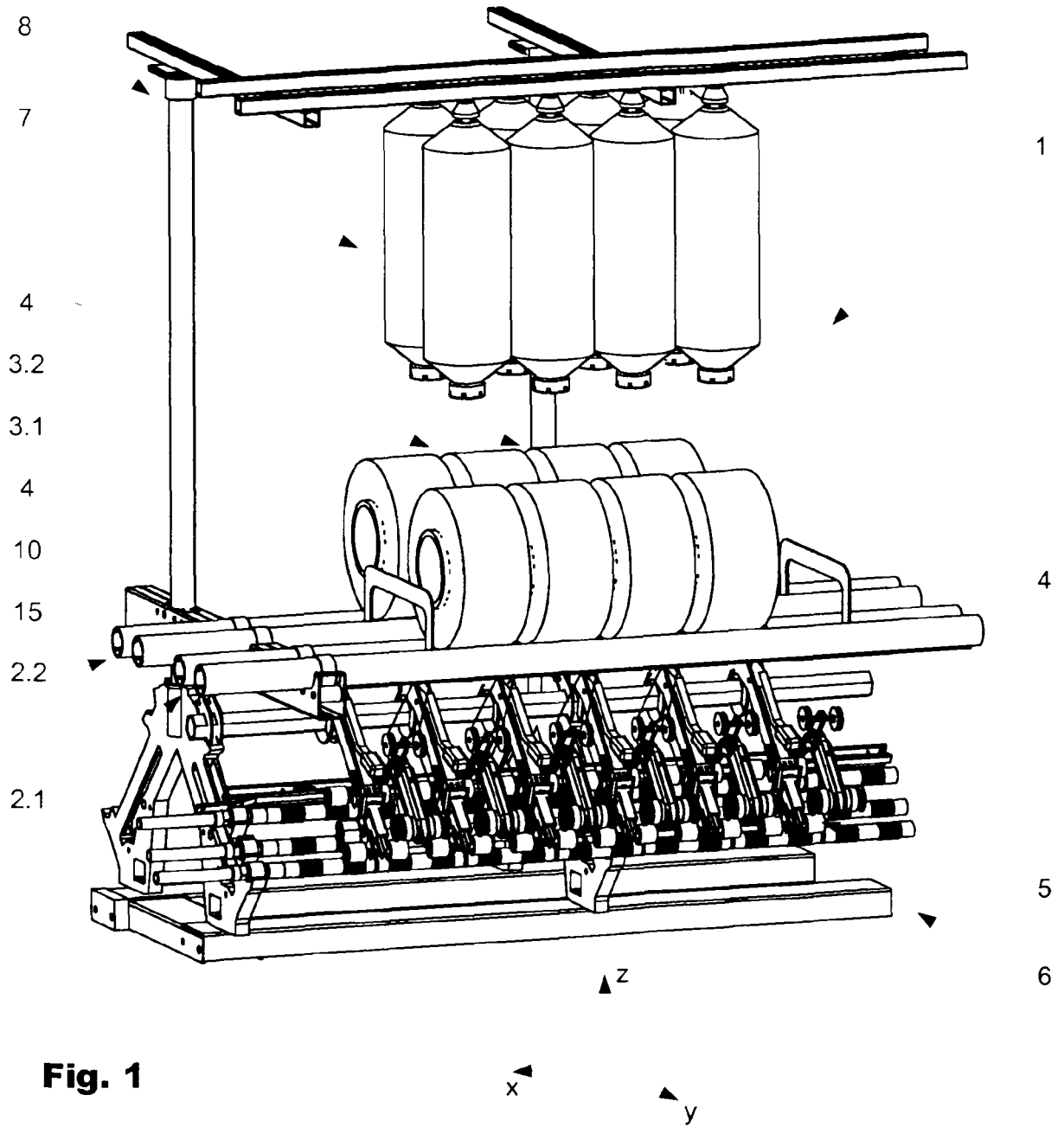
d. pour chaque bobine (3.1, 3.2), une première poulie de renvoi (13) est disposée entre les cylindres à déroulement (2.1, 2.2) et un cylindre de distribution (11) du banc d'étirage (5) pour dévier un filament à âme (10) dévidé depuis la bobine de filament à âme (3.1, 3.2) avant qu'il intègre le processus de filage au fuseau via le cylindre de distribution (11);

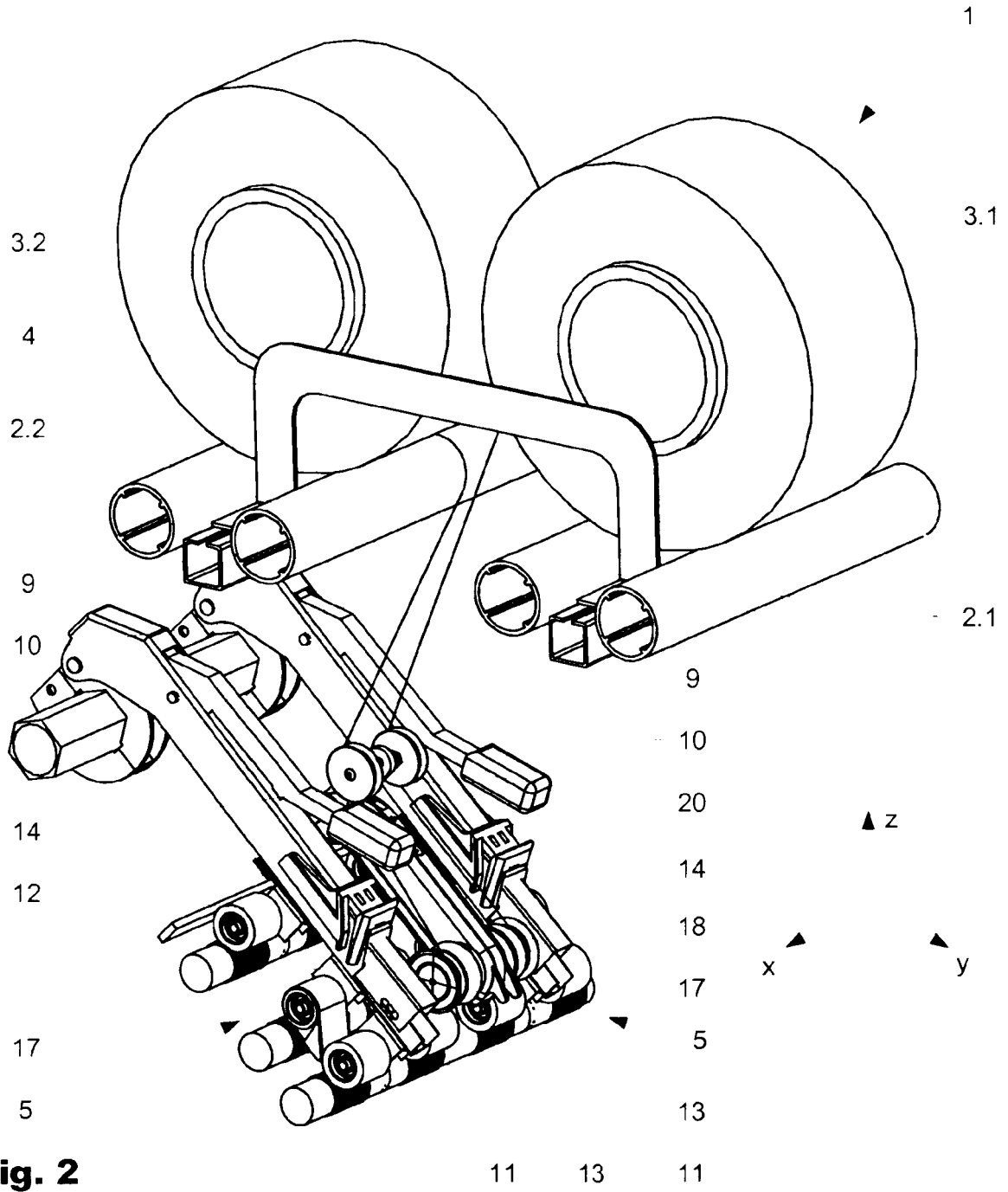
e. la première et la deuxième paire de cylindres à déroulement (2.1, 2.2) sont actionnées dans la même direction l'un par rapport à l'autre de façon qu'une bobine de filament à âme (3.1, 3.2) puisse être dévidée depuis la première vers la deuxième paire de cylindres à déroulement (2.1, 2.2) sans arrêter le processus de filage.

2. Appareil (1) selon la revendication 1 **caractérisé en ce que** la première poulie de renvoi (13) est disposée au-dessus du cylindre de distribution (11) de l'unité de traction (5).

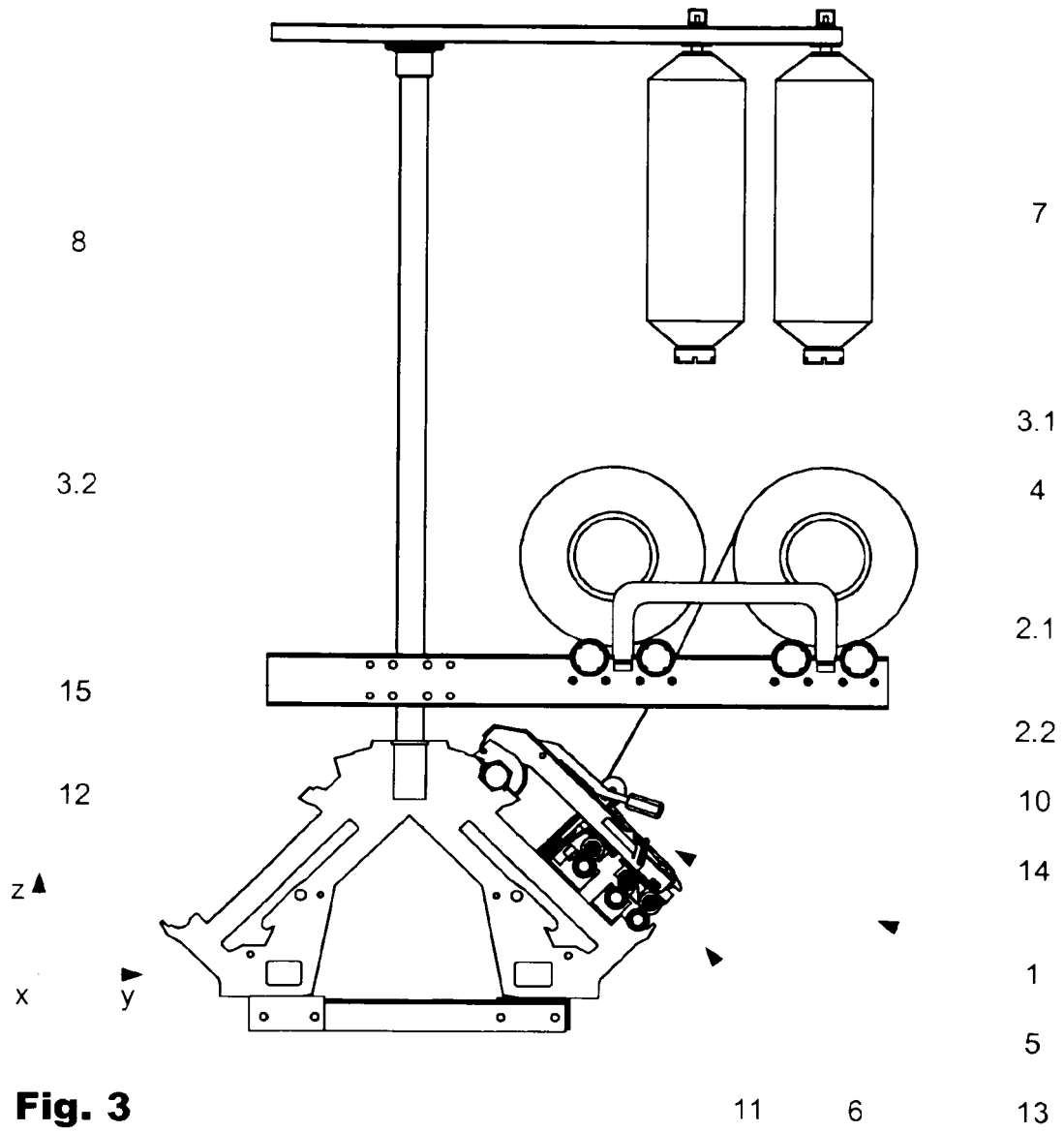
3. Appareil (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**une deuxième poulie de renvoi (14) est disposée entre la première poulie de renvoi (13) et la première et la deuxième paire de cylindres à déroulement (2.1, 2.2). 5
4. Appareil (1) selon la revendication 3, **caractérisé en ce que** la deuxième poulie de renvoi (14) est disposée au-dessus d'une poulie d'entrée (12) du banc d'étirage (5). 10
5. Appareil (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**au moins une des poulies de renvoi (13, 14) est disposée de façon amovible. 15
6. Appareil (1) selon la revendication 5, **caractérisé en ce qu'**au moins une poulie de renvoi (13, 14) est disposée de façon orientable par rapport à la force d'un ressort ou d'un contrepoids. 20
7. Appareil (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**au moins une des poulies de renvoi (13, 14) est interconnectée à des moyens de détermination de la présence du filament à âme (10). 25
8. Appareil (1) selon la revendication 7, **caractérisé en ce qu'**au moins une poulie de renvoi (13, 14) est interconnectée à des moyens d'arrêter le processus de filage d'un fuseau dédié. 30
9. Appareil (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la première et la deuxième paire de cylindres à déroulement (2.1, 2.2) sont disposées en direction verticale (z) au même niveau l'une et l'autre. 35
10. Appareil (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** deux bobines d'un filament à âme (3.1, 3.2) disposées l'une derrière l'autre (y) sont séparées d'une bobine voisine de filament à âme (3.1, 3.2) dans la direction de l'axe de rotation des bobines (x) par un espaceur commun (4). 40  
45
11. Appareil (1) selon la revendication 10, **caractérisé en ce que** l'espaceur (4) est fixé à deux tiges supports (9), chaque tige support (9) étant disposée entre les cylindres à déroulement (2.1, 2.2) d'une paire de cylindres à déroulement (2.1, 2.2). 50

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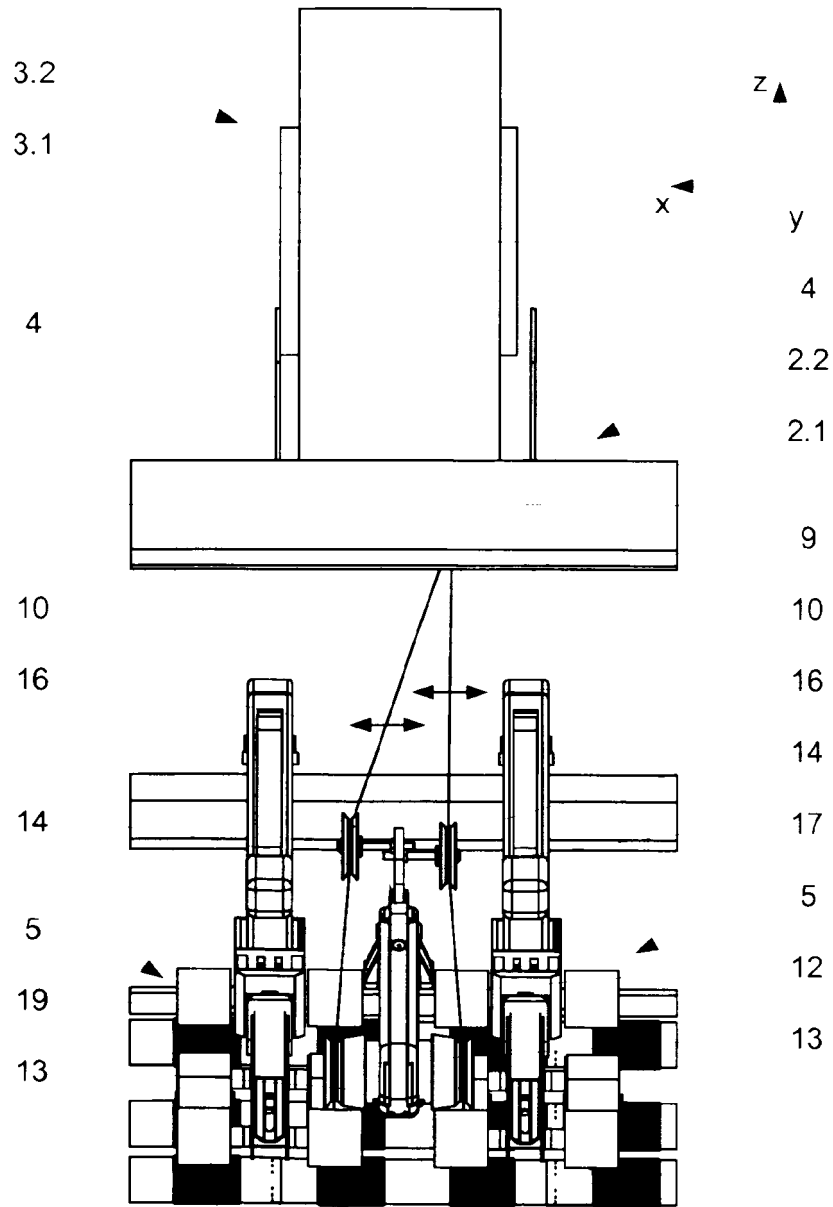




**Fig. 2**



**Fig. 3**



**Fig. 4**

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**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- US 2024156 A [0003]
- US 2210884 A [0003]
- FR 1449645 [0004]
- DE 19501163 [0005]
- US 2006179810 A [0007]
- EP 2006422 A [0008]
- WO 08068294 A [0009]