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TWISTING MACHINES FOR HEAVY BOBBINS FOR
THE COLLECTION OF TWISTED YARN

3,543,502

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2 Sheets-Sheet 1

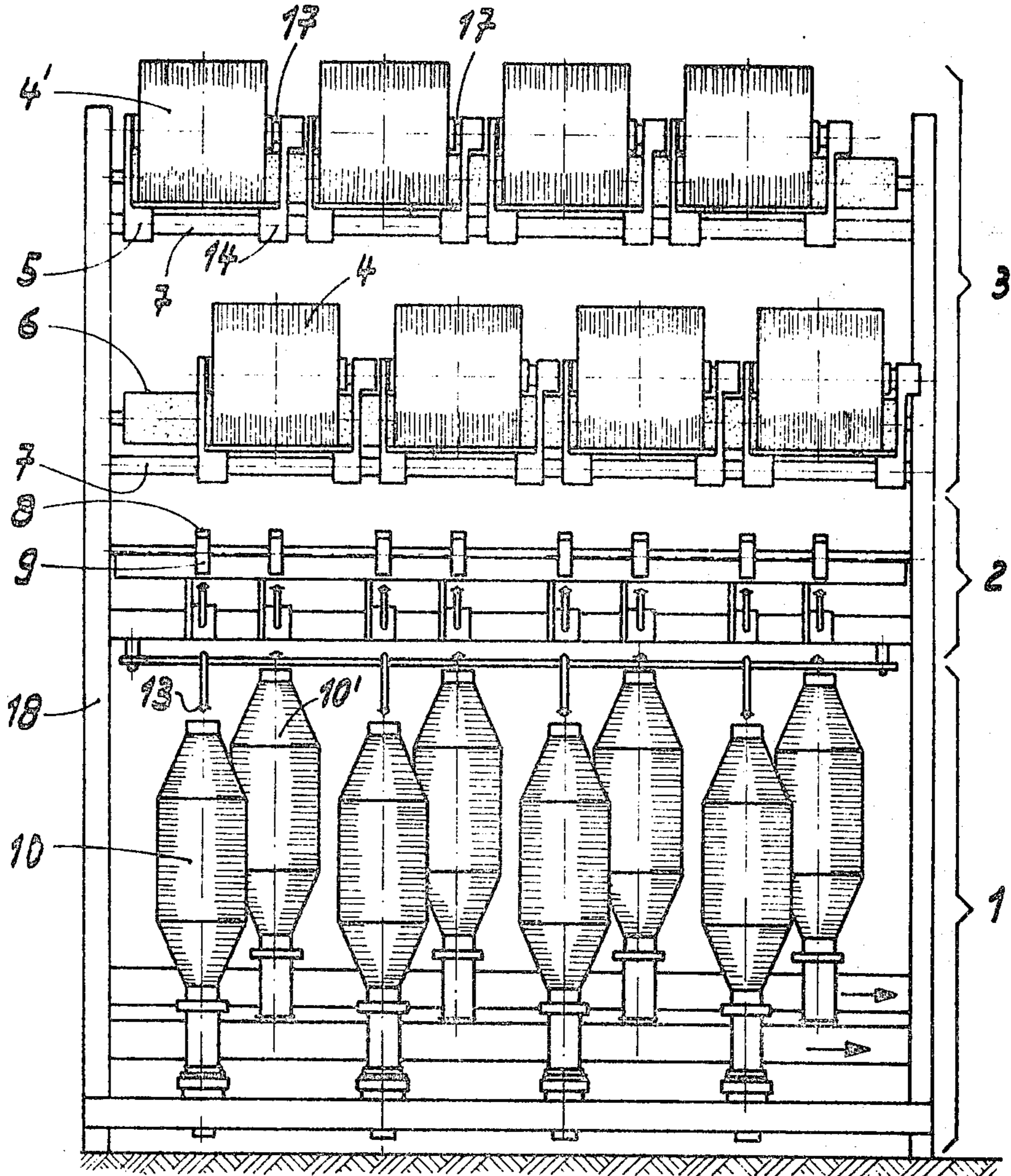


Fig. 1

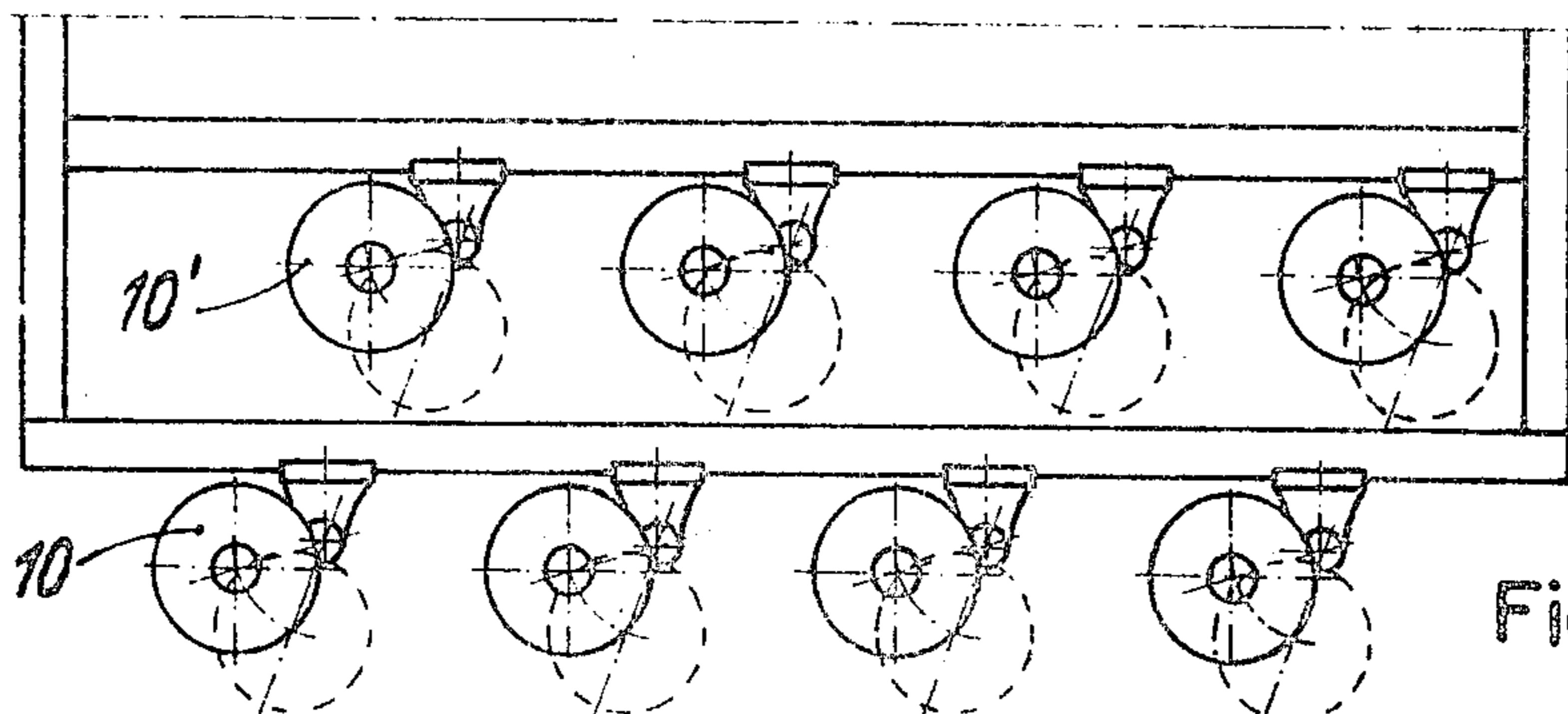


Fig. 2

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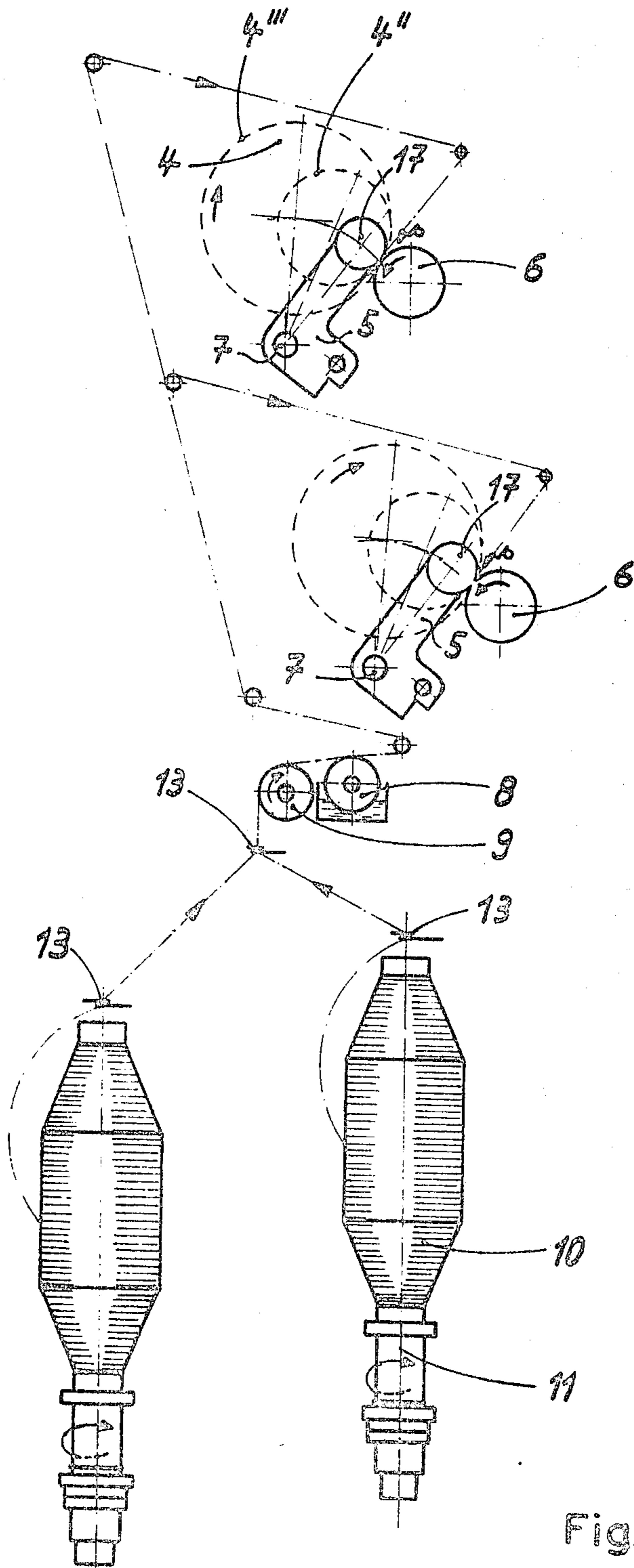


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**TWISTING MACHINES FOR HEAVY BOBBINS FOR
THE COLLECTION OF TWISTED YARN**
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3 Claims

ABSTRACT OF THE DISCLOSURE

A twisting machine for heavy bobbins includes a dragging roller for each bobbin, the bobbins resting peripherally by gravity against the dragging rollers. Each bobbin is mounted for vertical swinging movement about an axis disposed beneath the bobbin, so that the axis of rotation of the bobbin and the axis of vertical swinging movement of the bobbin define a plane which occupies a more upright position when the bobbin is larger than when the bobbin is smaller. In this way, the heavier the bobbin, the less directly it bears against the dragging roller, so that the pressure exerted by the bobbin on the dragging roller tends to be constant.

The present invention relates to a twisting machine for heavy bobbins, distaffs or the like for collecting twisted yarn which differs from the conventional twisting machines with superposed planes for the particular disposition of its main components, namely: the twisting spindles, the control and auxiliary members and the collection bobbins.

It is well known in the art of yarn twisting that the gradual increase in weight of the collecting means or bobbins, the high productivity and the functional economy required in our days have led to the construction of twisting machines with planes which the designers try to reduce more and more in number with respect to the conventional machines in the aim of saving time and labour. Nevertheless, for charging and discharging the collection bobbins the machine operators are bound, up to now, to perform a heavy and tiresome displacement of said bobbins in vertical direction.

The bobbins used at present have such a considerable weight and are wound up at such a winding speed that the men or women operators charge and discharge said bobbins in a most tiresome as well as irrational way usually with the aid of boards, stepladder or similar means.

By way of example, suffice it to mention that, at present, low twisting operations on yarn of average numbering (about 100 deniers) are performed at a winding speed of about 180 meters per minute, employing bobbins with a weight of 2700 kg. each.

It is expected that these figures will keep increasing in the future.

Since the quantity of yarn for each twisting charge amounts to 430 kg. and the weight of the empty bobbins to about 160 kg. it results that the weight to be lifted every 12 hours is about 590 kg.

Such a heavy work which is to be performed daily is inadmissible much the more so as the charge and discharge operations can be effected only from very uncomfortable and completely irrational positions.

The twisting machine of the present invention eliminates all the above mentioned disadvantages and is so designed as to allow for rational and easy charge and discharge operations.

Said twisting machine is characterized in that it has a single plane and comprises a fore half portion and a back half portion completely equal and symmetrical to

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each other which are disposed side by side, each half portion being formed by:

A lower zone having at least two rows of spindles disposed therein which are preferably not alined but offset i.e. staggered with respect to each other and are provided with their relative twisting means;

An intermediate zone having all the control and auxiliary members such as the overfeeding and oiling devices preferably alined along a single row; an upper zone having the bobbins for the collection of the twisted yarn alined on at least two preferably offset rows, said bobbins being mounted on supports which permit keeping constant the pressure exerted by said bobbins on the relative dragging rollers even as the weight on said bobbins keeps increasing.

All the above mentioned components of all said three zones being placed at such a height from the floor that they may be readily operated by the arm of a person of average tallness who stays upright.

To make the invention better understood reference is made hereinafter to the accompanying drawings which diagrammatically show the disposition of the various twisting means according to the present invention.

In the drawings:

FIG. 1 is a front view of the fore half portion.

FIG. 2 is the incomplete plan view on FIG. 1.

FIG. 3 is the cross section through the fore portion shown in FIG. 1.

The illustrated twisting machine comprises: a fore half portion as shown in FIG. 1 and a back half portion (non-represented) equal and symmetrical thereto and adapted to be placed side by side.

The fore half portion comprises: a lower zone 1 (FIG. 1) having at least two rows of spindles 10-10' staggered or offset with respect to each other (as also shown in FIG. 2) in order to facilitate the access to the back spindles 10'. Each spindle is provided at its upper portion with a device 13 associated thereto to cooperate in the twisting process.

As also visible in FIG. 3 the intermediate zone 2 (FIG. 1) comprises all the control means and auxiliary means, such as the overfeeding devices 9 and the oiling devices 8, all alined along a single row.

The upper zone 3 (FIG. 1) comprises two preferably staggered or offset rows of bobbins 4 and 4' for the collection of the twisted yarn, said bobbins being mounted on the supports 5, 14, 7, 17 which are so designed as to allow to keep constant the pressure exerted by said bobbins 4 and 4' on the dragging rollers 6 associated thereto even as the weight of said bobbins increases. This effect will be better explained in the following.

As illustrated, it appears at once that, contrarily to the conventional twisting machines, passing from the twisting to the collection the yarn moves upwards so that the operator charging the machine has to place the full and therefore heavy spindles in a low position and the still empty and therefore very light bobbins 4 in a high position, the charging work being therefore in both cases reduced as much as possible.

During the twisting process the weight of the yarn is lifted by the machine from the low zone 1 to the high zone 3.

For the discharge operations the heavy bobbins 4 are carried by the operator downwards (and not upwards as in the conventional machines) whereby the work is again reduced as much as possible.

To further facilitate the charging and discharging work all the devices and means are placed in such positions as to be easily reached by a person of average tallness standing upright and rotating his or her arm in an easy way.

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Furthermore, the offset or staggered disposition of the spindles in the lower zone consents to have a great number of spindles within a small area without impairing their accessibility and also avoiding the danger of having the bobbins 4 soiled with the oil dropping from the spindles, as it happens in the conventional machines.

The control and auxiliary members disposed in the intermediate zone 2, being the only ones which are not at all influenced by the dimensions of the bobbins 4, they have been arranged along a single row to permit easy visual control from the front portion of the machine.

A further important feature of the twisting machine according to the present invention consists in the supporting means for the bobbins 4, these supports being illustrated in FIG. 3. Each of said supporting means is formed by two head portions 5 and 14 (FIG. 1) connected to each other by parallel pins: a lower pin 7 pivoted to the machine frame 18 and an upper pin 17 adapted to receive the bobbin 4.

The position of the two pins or pivots is such that when the bobbin is empty (see the dotted line 4" in FIG. 3) and weighs on the dragging roller 6, the plane passing through the two pivots 7-17 is inclined with respect to the normal or vertical plane. On the contrary, when the bobbin increases in volume (4'" of FIG. 3) said plane tends to reach a vertical position so that the bobbin weighs less on the dragging roller 6.

The pressure exerted by the bobbin 43 on the dragging roller 6 is therefore constant and independent from its weight. It results that the wound up bobbin has a very constant compactness, a better form and a better capability of resisting to the damages to which it often incurs during its transportation.

From the foregoing it clearly appears that the twisting machine of the invention is very rationally designed in all its details and is apt to reduce to a minimum the labour for the operators.

What is claimed is:

1. A twisting machine for heavy bobbins, distaffs and the like for the collection of twisted yarn, characterized in that it has a single plane and comprises a fore half portion and a back half portion equal and symmetrical to each other which are disposed side by side, each half portion being formed by:

a lower zone (1) having at least two rows of spindles disposed therein which are provided each with a twisting ring;

an intermediate zone (2) having overfeeding and oiling devices alined in a single row;

an upper zone (3) having bobbins for the collection of the twisted yarn alined in at least two rows,

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dragging rollers that bear against said bobbins; said bobbins being mounted on supports which are pivoted so as to keep constant by gravity the pressure exerted by said bobbins on said dragging rollers even as the weight of said bobbins keeps increasing; and furthermore characterized in that all the above-mentioned components of all the three said zones are at such a height that they may be readily operated by a person of average height standing before them.

2. The twisting machine as claimed in claim 1, characterized in that each of said supports for the bobbin comprises a frame formed by two head portions connected to each other by two parallel pins, a lower pin pivoted to the frame of the twisting machine and an upper pin adapted to receive the bobbin; the position of the two pins being such that when the bobbin is empty and rests on the dragging roller the plane passing through the two pivots is inclined with respect to the vertical plane, while when the bobbin is increasing in volume and weight, said plane tends to reach a vertical position so that the bobbin bears less directly on the dragging roller.

3. A twisting machine for heavy bobbins, comprising a plurality of bobbins, a dragging roller for each bobbin and against which the bobbin bears peripherally, and means mounting the bobbins for bodily vertical swinging movement about a horizontal axis that defines with the bobbin axis a plane which is more nearly vertical when the bobbin is large and relatively heavy than when the bobbin is small and relatively light, whereby the bobbin bears against the dragging roller by gravity more or less directly according to the size and weight of the bobbin thereby to keep substantially constant the pressure exerted by the bobbin against the dragging roller.

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