Jan. 25, 1949. J. SERRA Y SIÓ 2,460,152

DRIVING MEANS FOR SPINNING, TWISTING, AND LIKE SPINDLES

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Fig. 1

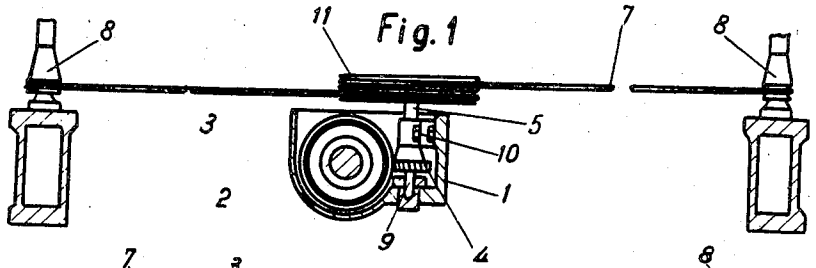


Fig. 2

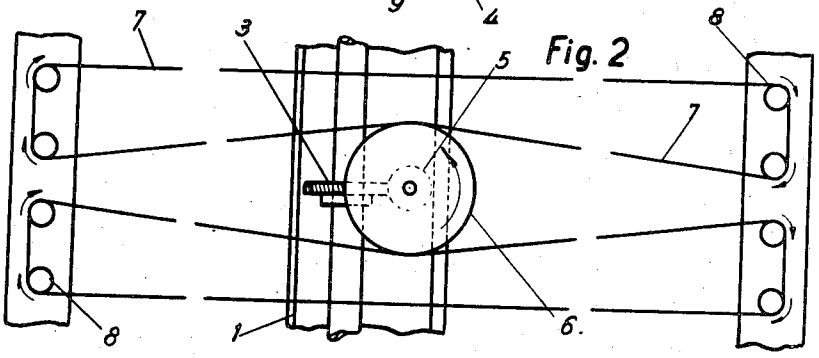


Fig. 3

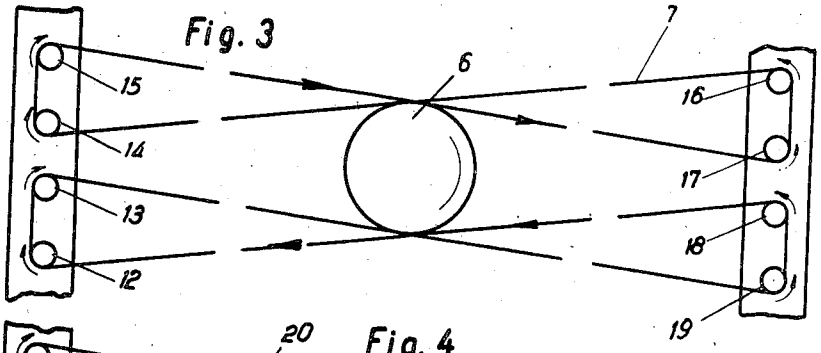


Fig. 4

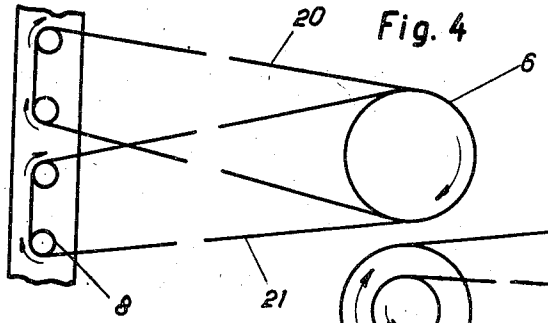
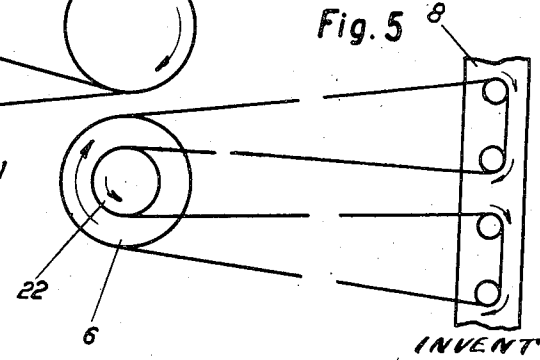


Fig. 5



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DRIVING MEANS FOR SPINNING, TWISTING, AND LIKE SPINDLES

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5 Claims. (Cl. 57—104)

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This invention relates to a new system of actuation of the spindles of continuous machines for spinning, twisting and the like.

It is known that hitherto the actuation of the spindles of the said machines has been carried out by means of a cylinder, popularly termed the "lantern," which is located longitudinally along the length of the machine, in the interior thereof, and is provided with rotary movement, and which, by means of bands or cords, transmits its movement to the spindles themselves.

Both systems of actuation possess in practice different and serious disadvantages, mainly in the machines in which the spindles are actuated by means of bands, since for the machine to function with this system it is necessary to rely upon a tensioning device, which, by means of a counterpoise, effects the necessary tension and compensates for the natural stretching which the band experiences with use.

Moreover, this system gives rise to a very high consumption of motive power, and possesses the disadvantage that when the machine is used in twisting, to both right or left, it is necessary to loosen the bands in order to give them a new direction of travel and adjust the tensioning devices to the corresponding angle, all of this at the cost of a considerable period of stoppage of the machine, with a corresponding loss of production of same. To obviate these disadvantages, the fitting of a double tensioning device was devised so that the band would not have to be loosened to adapt it to the new direction; but the adoption of the said double tensioning device increased to a considerable degree the consumption of motive power of the machine itself.

To obviate these and other serious disadvantages which the systems hitherto in use possess in practice, the applicant has devised and put into practical form this new system of actuation of the spindles of continuous machines for spinning, twisting and the like, which is shown by way of example in one case of practical realisation of the system, by means of which the machine is improved in a variety of ways, both in its technical nature and in its appearance, and also from the economic point of view, both in its manufacture and in the economy of power consumed by the machine itself.

The essential feature of the system consists in

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arranging inside the machine, along the length of the same, and at suitable distances apart, a number of horizontally arranged pulleys with one, two or more grooves for the passage of the bands or cords, these pulleys being provided with a rotary movement, whereby they transmit the movement to the spindles by means of the bands or cords arranged for this purpose.

For the actuation of the said horizontal pulleys there is arranged a gear box along with the machine, in the interior of same, in the centre of which is mounted a rotatable shaft, which carries, at fixed and suitable distances apart, several groups of gears with helicoidal or conical teeth, such as skew-bevel or spiral gears which actuate a small shaft or part on which is mounted the horizontal pulley that actuates the spindles.

One of the advantages of this system over those systems known hitherto is that of great economy of motive power, due mainly to the elimination of moving masses, more or less heavy, but always of large volume, and eliminating also to a great extent the friction of many moving parts.

Another advantage is that of great ease of construction, since similar parts are used this permits of mass production, thus effecting at the same time a considerable saving in material.

Another of the advantages consists in the elimination of the danger of accidents which are so liable to occur in this type of machine, at the same time leaving completely free the space between the horizontal pulleys and the ground. Moreover all the tensioning devices are eliminated.

The invention is illustrated by way of example in a purely diagrammatic manner in the accompanying drawings, in which:

Figure 1 is a transverse section of a continuous machine provided with the new system of actuating of the spindles; and

Figures 2, 3, 4 and 5 are plan views of modifications.

As may be seen, a gear box 1 is arranged longitudinally of the machine, and inside the same and in the said box 1 is arranged a shaft 2, to which are connected in fixed manner gears such as 3, with helicoidal or coned teeth, each of which actuates a pinion 4 mounted on a shaft 5, to which is connected at its upper extremity a hor-

izontal pulley 6, which by means of the bands or cords 7 actuates the spindles 8 of the machine. The vertical shaft 5 of each of the pulleys 6 is supported at its lower part by a footstep bearing 9, and at its upper middle part it is held by a support 10 fixed to the lateral part of the casing. The gears 3 are partly immersed in an oil bath arranged inside the casing 1 and which by splashing lubricates at the same time the shaft 2 and the pinion 3. The upper part of this system is closed by a cover 11 which prevents the escape of oil from the casing 1.

By means of this system the bands or cords that actuate the spindles are arranged horizontally, and the actuation of the same is effected without the necessity of tensioning devices, it being possible to cause the spindles themselves to rotate to right and left without the necessity of dismantling the bands or cords or of altering any of the travels of the same, by simply changing the direction of rotation of the shaft 2.

In order to explain the working of this system, Figure 2 shows a plan view of the said system operating two series of spindles arranged on opposite sides of the machine, in which, as may be seen, the same band or cord actuates eight spindles at the same time in the following way: The band or cord passes from a spindle on one side to another on the other side of the machine, passes round two spindles, passes round half a circumference of one of the grooves of the horizontal pulley 6, then passes to the same side of the machine again to go round two more spindles, and then passes directly to the other side of the machine, passing round two more spindles, after which it embraces, passes another semi-circumference of the horizontal pulley, and then returns to the original side of the machine to pass round two more spindles thus returning to the point of departure.

As may be seen in this installation of Figure 2, all the spindles 8 rotate in the same direction, and if the direction of rotation of the shaft 2 is changed, all the spindles will rotate in the opposite direction, or in other words the rotary movement of the spindles 8 will be reversed.

Figure 3 is a plan view of another embodiment of the system, adapted to two series of spindles each on an opposite side of the machine and in which the arrangement for the travel of the bands or cords is provided in such a way that the spindles of the two sides can rotate in opposite directions. For example, the cord 7, on leaving the horizontal pulley 6, passes round the spindles 12 and 13 of the left-hand side of the machine, passing thence directly to the other side of the machine, where it embraces the spindles 19 and 18, passes round half the circumference of the horizontal pulley 6, returns to the spindles 17 and 16 on the right. On leaving the spindle 16 the cord passes directly to the left-hand side of the machine to embrace the spindles 14 and 15, returning to the other channel of the horizontal pulley 6, round which it passes half a circumference to return to its point of departure. With this travel the spindles of one face will rotate in one direction and those of the other face will rotate in the opposite direction, or in other words the spindles 12, 13, 14 and 15 will rotate the the right and the spindles 16, 17, 18 and 19 to the left. As is natural, if the direction of rotation of the rod 2 is changed, the horizontal pulley 6 will rotate in the reverse direction and therefore all the spindles will change their direction of rotation, but those on one side of the machine will still rotate in the opposite direction to those on the other.

Figure 4 is a plan view of the arrangement for the travel of the bands or cords which may be adapted with this system for lines of spindles on one side of the machine in which the horizontal pulley 6 actuates, with two bands or cords 20 and 21, a group of two spindles for each band of the machine. The same result may also be attained in the form shown in Figure 5, if in this case there is arranged on the horizontal pulley 6 a loose pulley 22 to act as a return pulley, so as to obtain with a single band or cord the simultaneous movement of the four corresponding spindles.

In all the cases described, it will be sufficient to alter the direction of rotation of the shaft 2 in order to change that of the spindles 8, whatever the direction of travel of the bands or cords 7, both in the case of machines with spindles on opposite sides and those with spindles on one side only.

With regard to the transmission element, it may be constituted by joined bands or cords connected or with both elements in endless form, or they may be non-resilient and a metallic element may also be used as the transmission means.

With regard to the details of construction, such as dimensions, accessory forms and materials, they may be completely variable, as well as the class, type and system of the machine to which they are applied, and in general anything may vary so long as it does not alter, modify or change the essential nature of the invention described.

I claim:

1. A device for actuating the spindles of continuous spinning, twisting and like machines comprising a pulley rotatably mounted with its axis extending vertically, said pulley being formed with a pair of peripheral grooves, means for driving said pulley, a plurality of vertically positioned spindles and an endless band extending horizontally around part of one of said pulley grooves to and around an opposite side of two of said spindles, then to and around the other of said pulley grooves, then to and around an opposite side of a second pair of spindles and back to said first mentioned pulley groove.

2. A device for actuating the spindles of continuous spinning, twisting and like machines comprising a pulley rotatably mounted with its axis extending vertically, said pulley being formed with a pair of peripheral grooves, means for driving said pulley, two series of vertically positioned spindles with each series mounted on an opposite side of said pulley, and an endless band positioned around the outer sides of each series of said spindles to and around opposite sides of said pulley grooves.

3. A device for actuating the spindles of continuous spinning, twisting and like machines comprising a pulley rotatably mounted with its axis extending vertically, said pulley being formed with a pair of peripheral grooves, means for driving said pulley, two pairs of vertically mounted spindles, and an endless band horizontally extending around a side of said pulley in both of said grooves and to and around a side of each pair of said spindles opposite to said pulley.

4. A device for actuating the spindles of continuous spinning, twisting and like machines comprising a pulley rotatably mounted with its axis extending vertically, said pulley being formed having a pair of peripheral grooves, means for driving said pulley, two series of vertically mount-

ed pairs of spindles with each series on an opposite side of said pulley and an endless band extending to and around opposite spindles of each pair of spindles of said series and to and around opposite sides of said pulley grooves.

5. A device for actuating the spindles of continuous spinning, twisting and like machines comprising a pulley rotatably mounted with its axis extending vertically, said pulley being formed having a pair of peripheral grooves means for driving said pulley, a plurality of vertically mounted pairs of spindles, and an endless band extending horizontally with each end portion around a half of one of said pulley grooves to and around the portion of each pair of said spindles on a side opposite to said pulley.

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