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ARRANGEMENT IN SPINNING REGULATORS

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Fig. 2.

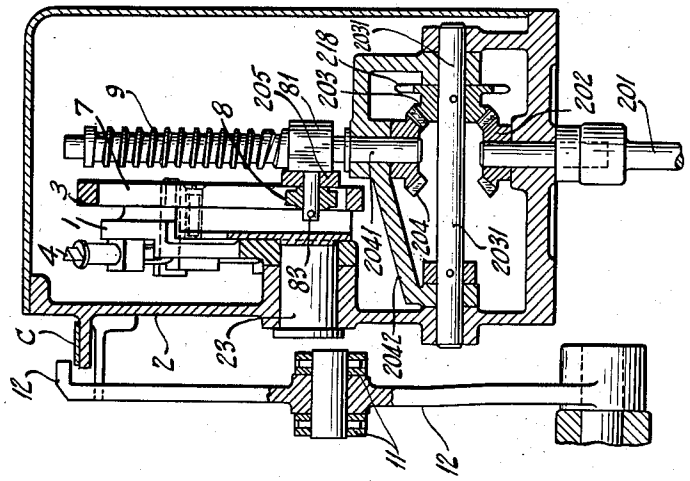
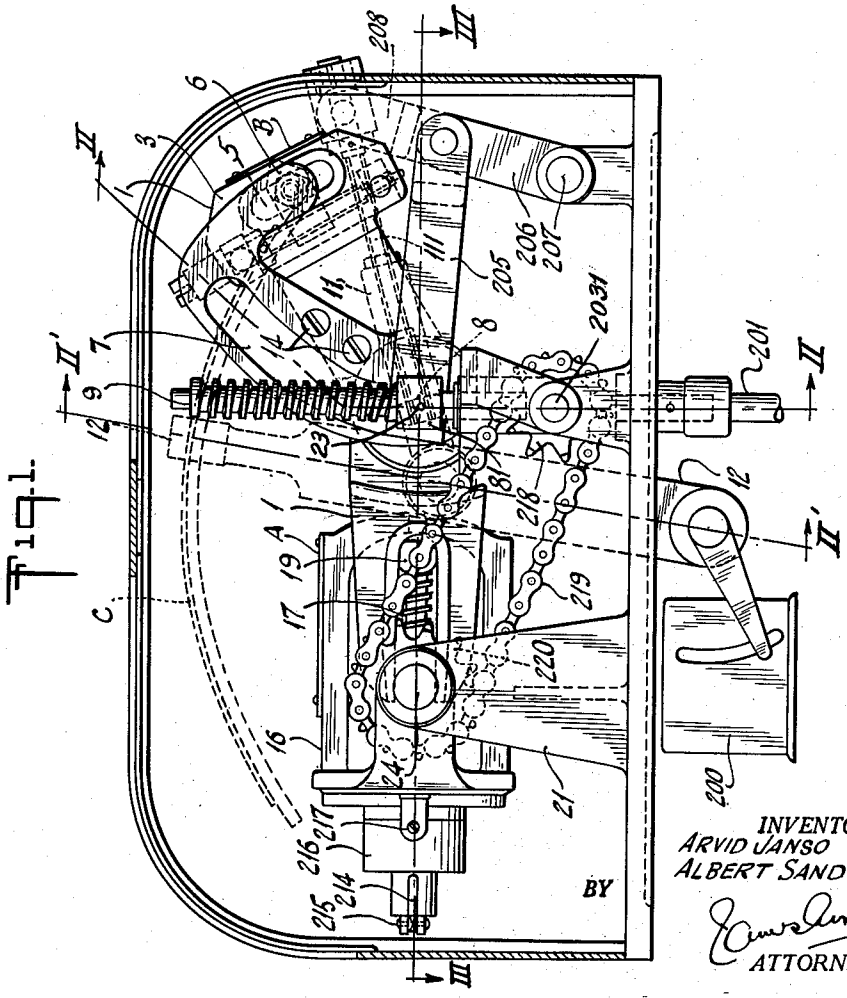


Fig. 1.



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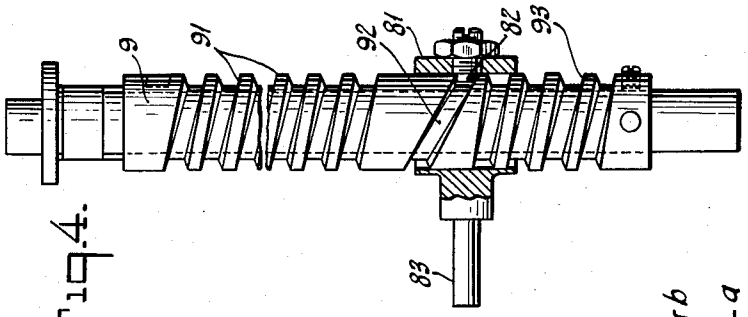


Fig. 4.

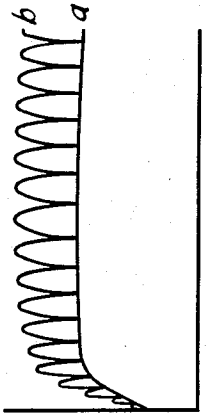


Fig. 6.

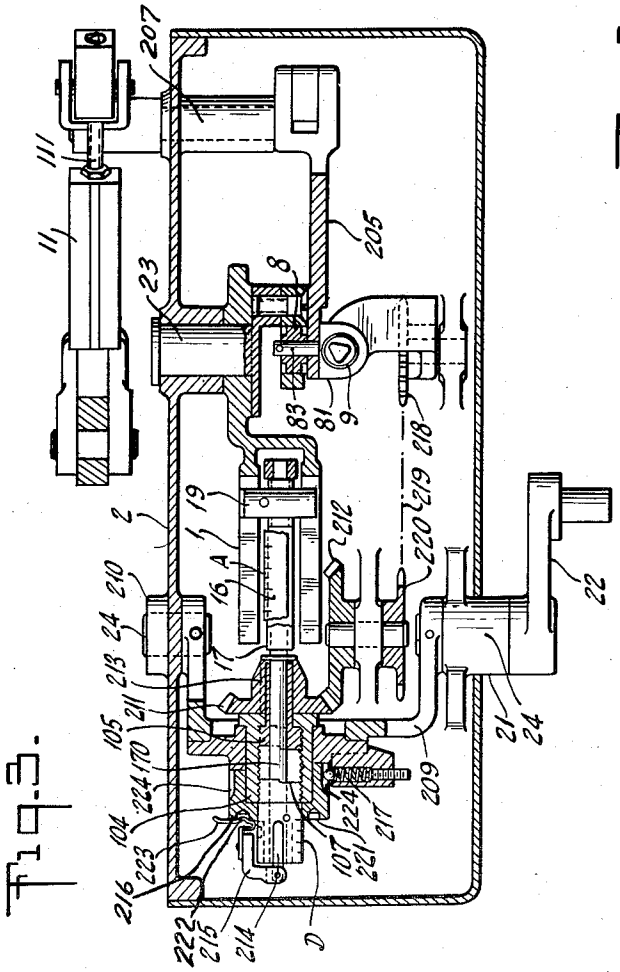


Fig. 3.

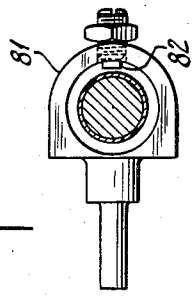


Fig. 5.

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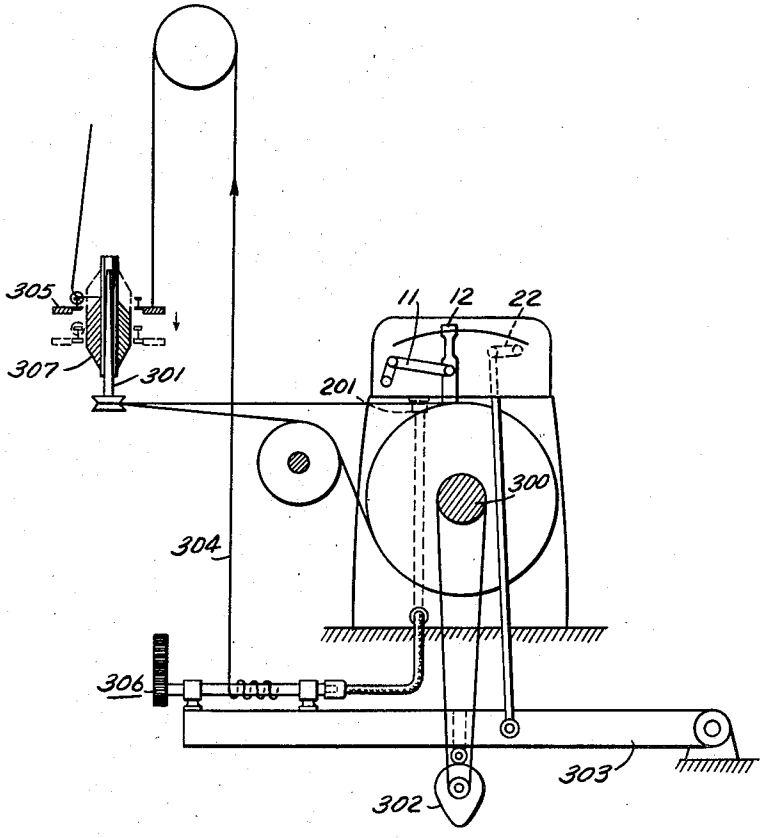
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ARRANGEMENT IN SPINNING REGULATORS

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Fig. 7



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Patented Sept. 22, 1953 2,652,681

UNITED STATES PATENT OFFICE

2,652,681

ARRANGEMENT IN SPINNING REGULATORS

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Application February 25, 1949, Serial No. 78,278
In Czechoslovakia October 27, 1948

2 Claims. (Cl. 57—95)

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The present invention relates to electrically driven ring spinning machines and in particular to spinning regulators for such machines of the type in which a wing, oscillating in accordance with the up and down movements of the ring rail, is provided with a curved slot in which a guiding piece, connected with the speed regulating device of the machine driving motor, is caused to slide under the influence of a guide screw which is rotated by means of the ratchet wheel of the ring rail. The regulator controls the spinning of the thread on to a bobbin according to a spinning diagram or curve, the fundamental form of which is determined by the shape of the slot in the wing and the path of the guiding piece along the guide screw. The form of the top curve deposited on the fundamental curve is determined by the oscillations of the wing.

The path of the guiding piece, which for constructional reasons has a constant length, also corresponds to the bobbin filling. For various reasons the speed must be low at the beginning of the spinning, but in order to obtain the greatest possible average speed and, by this, the greatest possible output, it is very important to allow the fundamental curve to reach its maximum value as soon as possible. For cops having lengths up to 7" or 8" this regulation can be obtained by a suitable shape of the slot in the wing, but for larger lengths of the cops constructional difficulties are encountered, as the slot cannot be made as steep as may be required for spinning long cops.

In order to increase the steepness of the fundamental curve the guide screw according to the present invention is provided with threads of two pitches, one of which is coarse and causes a rapid displacement of the guiding piece at the beginning of the spinning and the other of which is rather fine and causes a slow displacement of the guiding piece during the remaining part of the spinning. The guide screw can also be made with threads of several different pitches in order to modify other parts of the fundamental curve, if required. In order to make it possible to work with several pitches, the guiding piece is provided with a sleeve surrounding the guide screw and having an inwardly projecting pin guided by the screw threads. The thread can be made with several starts and the guiding piece will then have a number of trunnions corresponding to the number of starts.

An arrangement of the invention will now be described with reference to the accompanying drawings in which,

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Figure 1 is a side view, partly in section, of a regulator according to the invention,

Figure 2 is a sectional view of the regulator of Figure 1, taken mainly on the line II—II and with its left-hand portion taken on the line II'—II' of Figure 1,

Figure 3 is a sectional view of the regulator of Figure 1, taken along the line III—III of Figure 1,

Figure 4 is a plan view, partly in section, on an enlarged scale of the two threaded guide screw and sleeve,

Figure 5 is an end view, partly in section, of Figure 4,

Figure 6 is a diagram of a spinning curve, and

Figure 7 shows diagrammatically the well-known arrangement of a ring spinning machine.

Similar parts are designated by the same reference numerals in the figures.

The movement for moving the ratchet wheel for imparting stepwise movement to the ring rail of the spinning machine, and which regulates the speed of the machine driving motor during a whole spinning period, the so-called fundamental speed, is transmitted to a bevel gear situated on the bottom side of the bearing shield of the ring spinning motor not shown on the drawings, and from there it is transmitted by means of a shaft 201 and bevel gears 202, 203, 204 (Fig. 2) to a guide screw 9 which moves a guiding piece or die 8 within the slot 7 of a slotted plate or wing 3 through the medium of a travelling sleeve 81 hereinafter described. The wing 3 is adjustable with respect to a bell-crank lever 1 (Fig. 1) serving as a regulator member, by means of a screw 4 (Fig. 2). The bell-crank lever 1 consists of a bifurcated end (at the left hand of Fig. 1) and an arm (at the right hand of Fig. 1) and is pivoted about the centre of rotation 23. The adjustment of the wing 3 with respect to the bell-crank lever 1 is effected by the screw 4 in a slot 5 and can be indicated by a pointer 6 on a scale B (Fig. 1). In this way the inclination of the fundamental curve in Fig. 6 may be varied. Shaft 2041 (Fig. 2) of the driven gear 204 is directly connected to the guide screw 9 and is rotatably mounted in a supporting member 2042, which is mounted for angular movement on a shaft 2031. Said shaft 2031 must be situated out of the centre of rotation 23 of the bell-crank lever 1.

In Fig. 7, the well-known means for the movement of the ring rail and the spindles are indicated schematically. The numeral 300 is the main shaft of the spinning machine, and the

spindles 301 and the heart cam 302 are driven from the said shaft. The movement of the heart cam 302 is transmitted by the copping lever 303 and the chain 304 to the ring rail 305. The cam 302 causes the ring rail 305 to move up and down, and the chain 304 is wound up stepwise by the action of the ratchet wheel device 306 carried by the copping lever 303, thus producing the stepwise lifting movement of the ring rail according to the desired shape of the bobbin.

The guide screw 9, as will be seen from the more detailed Figures 4 and 5, is provided with three threaded parts 91, 92, 93 of which the upper and lower parts 91, 93 have a rather fine pitch and the middle part 92 has a coarse pitch. The lower part 93 is used only partly when spinning commences. A sleeve 81 surrounding guide screw 9 is fitted with a pin 82, adapted to engage the threads of screw 9, enabling the sleeve to be screwed up or down when the guide screw 9 is turned in one or the other direction. The guiding piece 8 and a link 205 are attached to a pin 83 protruding from the sleeve 81, as shown in Figures 2 and 3.

The movement of the guiding piece 8 in the slot 7 is transmitted by means of the link 205, a lever 206, a shaft 207, a lever 208 and a link 11 the length of which may be altered by the action of extension screw means 111 to a lever 12, which is connected to the regulating member 200 of the motor. The starting speed is set on a speed scale C mounted on the regulator casing 2 by means of the adjustable link 11.

The up and down movement of the ring rail 305, which varies the speed during spinning of a new layer (the so-called layer speed) is transmitted to a lever 22, which is connected to a lever 16 hereinafter referred to as a regulating arm and a driving screw 17 by means of a supporting piece 209 adapted to rotate on axis 24 in bearings 21 and 210.

The returning mechanism comprising bevel gears 211, 212 is arranged on the supporting piece 209. A sprocket 220 secured to gear 212 is adapted to be driven by a chain 219 from a sprocket 218 secured to bevel gear 203. The gear 211 is rotatably and slidably mounted on a screw 105, which in its turn is freely mounted on a cylindrical extension 170 of the driving screw 17. The screw 105 is provided with a driving pin 213 slidable in a slot in the gear 211. When the gear 211 is turned in a certain direction, the screw 105 is screwed into the sleeve 104 and is arrested after a certain time by a threaded stop 107.

The stop 107 is provided on the outer end of its periphery with a number of slots 214 by which it can be locked in different positions through the action of a ratchet 215. This ratchet 215 is pivoted to the outer end of the screw 17 and is adapted to engage one of the slots 214 as well as one of the recesses 221 made in the front face of a sleeve 216 surrounding the sleeve 104, by means of an elevation 222 made on a spring member 223 attached to the ratchet 215.

The sleeve 216 is provided externally with grooves 224 in which a ball catch 217 is adapted to fit to prevent involuntary turning of the sleeve 216 by friction between the screw 105 and the sleeve 104.

When turning in the opposite direction the screw 105 reaches, after a certain time, the end of the sleeve 104 which is formed as a stop 108.

A guiding piece 19, fitting into the bell-crank lever 1, runs on the screw 17. Upon release of the ratchet 215 the guiding piece 19 may be set according to a scale A by rotation of the screw 17 without moving the screw 105, the stop 107 or the sleeve 104 of the returning mechanism from their positions. If the guiding piece 19 is set in the zero position of scale A, which is the fulcrum 24 of the screw 17, the amplitude of the layer speed is reduced to zero.

In ring spinning machines having conical or cylindrical building up of the cop, as is presumed in the present form of the spinning regulator, the guiding piece 19 is displaced on the screw 17 of the regulating arm 16 from a certain adjustable point of time inwards against the turning centre 24 of the supporting piece 209 in order to compensate the increase in amplitude, which is caused by the displacement of the guiding piece 8 of the guide screw 9. In machines with combined cylindrical and conical building up of the cop an opposite movement will be used in that the guiding piece 19 of the regulating arm, beginning in the turning centre 24 of the regulating arm, will be displaced from a certain point of time outwards on the arm in order to obtain a successively increasing amplitude of oscillation. The regulating diagram will in this case be entirely different from that previously used.

It will be understood that the screw 17 of the regulating arm and the guiding piece 19 can also be carried out for two or more pitches in order to obtain a modified form of the top curve.

The mode of operation of the above described regulator is as follows:

Rotation of the shaft 201 and the gear wheels 202, 203, 204 causes the guiding piece 8 to travel up on the screw 9, and the gear wheels 211, 212 to rotate through chain 219 and sprockets 218, 220. At the beginning of the spinning, the screw 105 contacts the stop 108 at the end of the sleeve 104, see Figure 3, but during the spinning it is screwed along the sleeve towards the stop 107, which is adjustable according to a scale D. If the position of stop 107 is adjusted on scale D to zero i. e. screwed out as shown in Figure 3, it is only reached by the screw 105 when the spinning period is finished. Thus the movement of the screw has in this case no influence on the amplitude.

If, however, the stop 107 is set at a value higher than zero on scale D i. e. screwed farther into the sleeve 104, it is reached by the screw 105 a certain time before the end of the spinning period and as the stop is connected to the sleeve 216 and the screw 17 by means of the ratchet 215, the movement of the screw 105 is now transmitted to the screw 17, whereby the guiding piece 19 is moved towards the turning centre 24 of the screw 17, which is also the turning axis of the supporting piece 209, and the amplitude of the layer speed is reduced.

The combined movement which is obtained by the oscillations of the bell-crank lever 1 and the displacement of the guiding piece 8 in the slot 7 is transmitted by the link mechanism 205, 206, 208, 11 and 12 to the regulating means of the machine driving motor, the speed of which thus is varied. The speed variations during the spinning period constitute the so-called spinning diagram which is different for different thread material, kind of yarn, yarn number and external conditions, such as working temperature, air humidity and so on. Different spinning diagrams can be set according to the scales A, B, C and D, preferably according to values determined or calculated beforehand, which values can easily be adjusted during service. Figure 6 shows a

typical spinning diagram which can be obtained by means of the present regulator. Here the curve *a* represents the so-called fundamental curve obtained by the movement of the guiding piece 8, and *b* the so-called layer curve obtained by the oscillations of the bell-crank lever 1.

In accordance with the present invention the spinning speed at the commencement of the spinning operation is relatively low but increases rapidly to its maximum value, this result being obtained by forming the threads of the guide screw with varying pitches.

We claim as our invention:

1. Arrangement in spinning regulators for electrically driven ring spinning machines, comprising a speed regulating device for a driving motor, a ring rail having an up and down movement, a wing adapted to oscillate in accordance with the up and down movements of the ring rail, a curved slot in said wing, a guiding piece connected with the said speed regulating device, means imparting stepwise movement to the ring rail, and a guide screw rotatable by said means

and adapted to move said guiding piece within said slot, said guide screw being provided with screw threads of different pitches, the major pitch serving for actuating the control of the initial speed of the driving motor whereas the minor pitch is adapted to control the speed during the remaining spinning period.

2. Arrangement in spinning regulators according to claim 1 wherein the said guiding piece comprises a sleeve enclosing the guide screw, and a pin on the inside of said sleeve.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,200,327	Eichberg et al.	Oct. 3, 1916
2,349,882	Reichelt	May 30, 1944

FOREIGN PATENTS

Number	Country	Date
715,178	Germany	Dec. 15, 1941