

June 19, 1934.

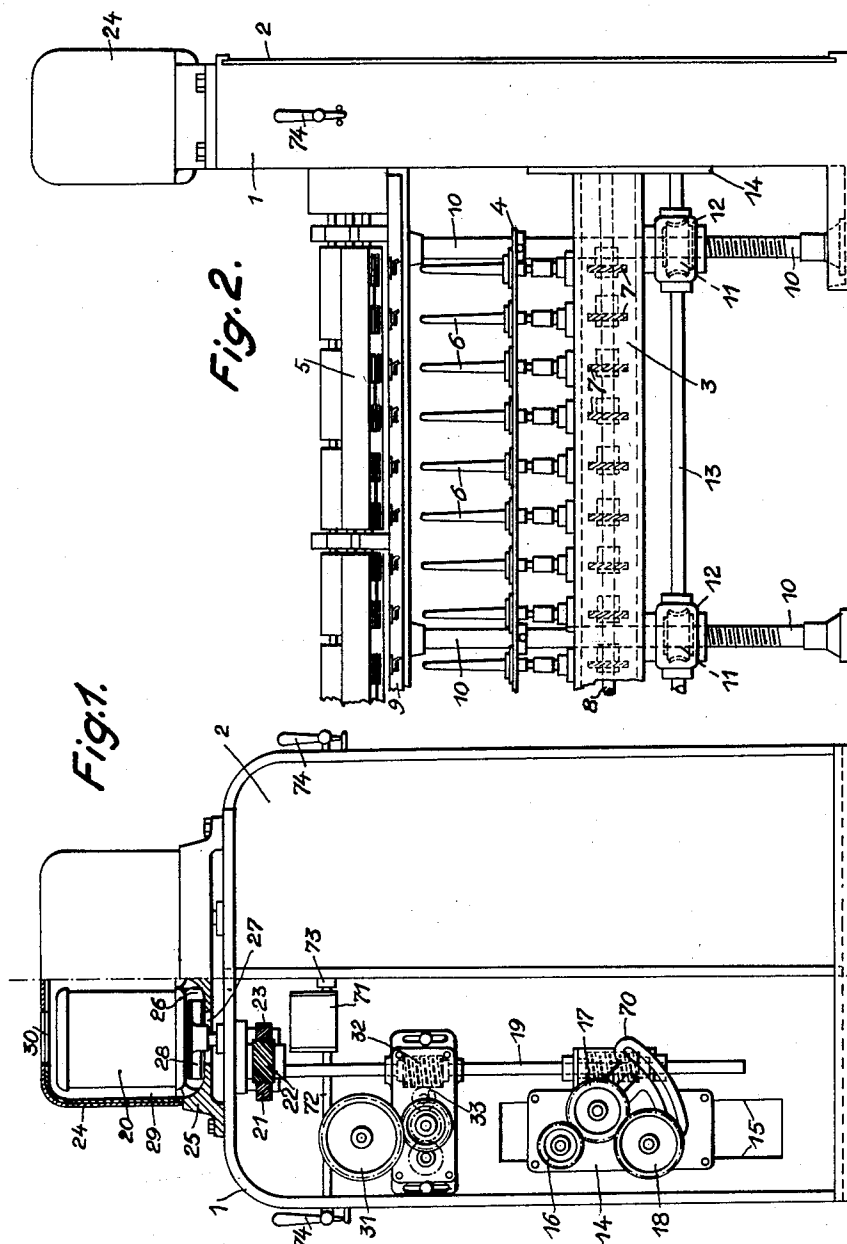
J. J. KEYSER

1,963,135

SPINNING AND LIKE FRAME

Filed May 12, 1931

3 Sheets-Sheet 1



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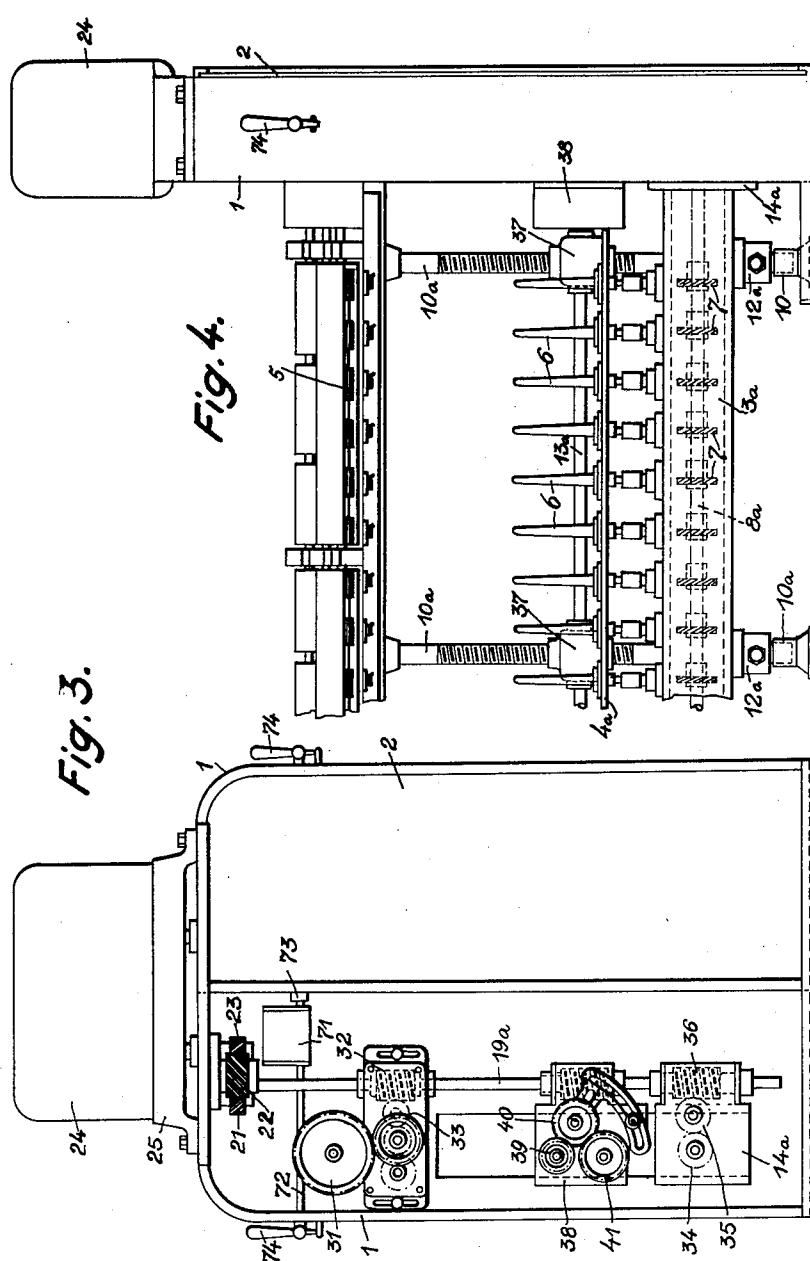
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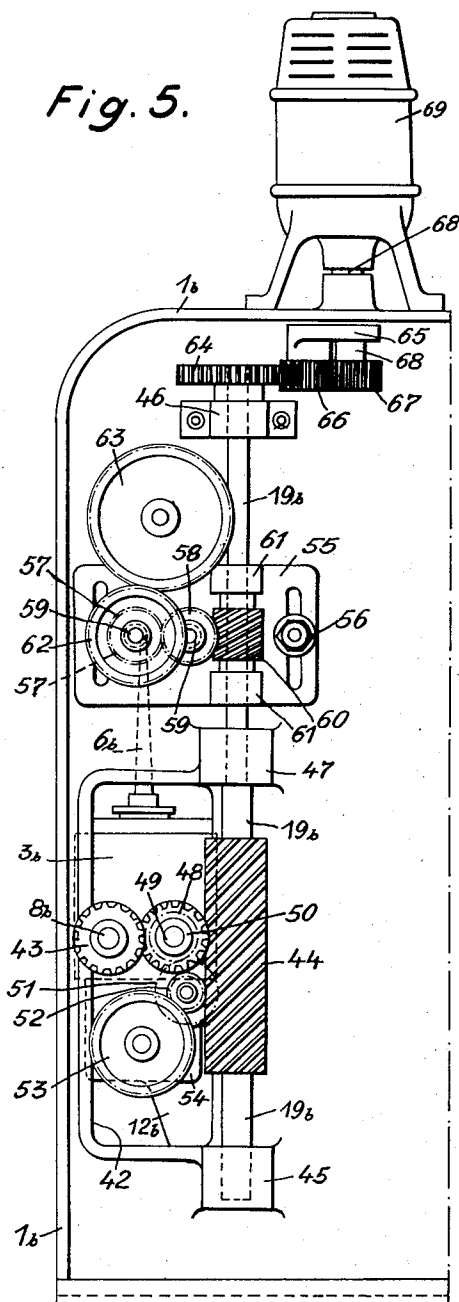
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Fig. 5.



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## UNITED STATES PATENT OFFICE

1,963,135

## SPINNING AND LIKE FRAME

Johann Jacob Keyser, Aarau, Switzerland

Application May 12, 1931, Serial No. 536,707  
In Switzerland and Germany May 20, 1930

4 Claims. (Cl. 118-45)

This invention relates to a driving means for speed frames, spinning frames and twisting frames having spindles operated by worm wheels, of the kind described in my prior Patent No. 1,765,236.

In the latter machine the spindle operating shaft of the drawing or delivery mechanism and the lifting and lowering device for the spindle or ring rail are driven by a motor through the medium of an auxiliary device, calling for continuous transmission from quick to slow run, and vice versa, so that a wholly synchronous operation of the spindles, the drawing or delivery mechanism and the lifting and lowering device for the spindle or ring rail is impossible.

A feature of the present invention consists in the provision of a vertical shaft mounted in the main casing and driving the spindles of the spindle operating shaft, which extends longitudinally of the machine, as well as the drawing or delivery mechanism and the lifting and lowering device for the spindle or ring rail.

An additional feature of the invention consists in the operation of the vertical shaft, either directly or indirectly, by means of a motor mounted on the cover.

A still further feature resides in the fact that the vertical shaft may be driven by a vertical motor, which may be an ordinary motor with short-circuited rotor with provision for external air cooling. A regulation of the motor is not required.

The invention will now be described more fully with reference to the accompanying drawings, which illustrates the same in various forms of embodiment.

Fig. 1 is the end view of a spinning frame having a liftable and lowerable spindle rail, the main cover being partly opened with the motor casing in section.

Fig. 2 is a front view of the frame according to Fig. 1.

Fig. 3 is the end view of a spinning frame having a liftable and lowerable ring rail, with the main cover partly opened.

Fig. 4 is a front view of the machine according to Fig. 3, and

Fig. 5 shows on enlarged scale a frame section furnished with a vertical motor.

Referring now to the drawings, the frame is furnished with a main cover 1, which may be closed at the front by means of two sliding doors 2. The frame itself possesses a spindle rail 3, a ring rail 4, and a delivery or drawing mechanism 5. In the spindle rail 3 the spindles 6 are

operated by worm wheels 7, which are driven by a shaft 8 mounted in the rail. The drawing or delivery mechanism 5 is situated on a cover plate 9, which is supported by the spindle columns 10. On the cover plate 9 there is provided (not shown) the usual creel for the roving, etc.

According to Figs. 1 and 2, the spindle rail 3 is mounted to be liftable and lowerable on the columns 10, and the lifting and lowering movement is performed by means of the worm wheels 11, which are mounted to be rotary in supporting blocks 12. These worm wheels 11 are driven by a worm shaft 13, which extends over the entire length of the spindle rail 3. At the end of the rail 3 there is provided the gear casing 14, which is capable of sliding upwards and downwards in a guide 15 on the main cover 1.

The gear casing 14 contains the operating wheels for the spindle operating shaft 8 as later described in conjunction with Fig. 5. Beyond this there are also provided on the gear casing 14 the variable speed wheels 16, 17 and 18, which may be variously adjusted by means of the bearing 70. The wheel 18 drives a variable speed and reversing gear in the casing 14, for example of the kind described in my copending patent application Ser. No. 456,226, filed May 27, 1930, this gear driving in turn the worm shaft 13 to permit of the lifting and lowering of the spindle rail conforming with the shape of the cops to be formed on the spindles 6.

The operation of the gear casing 14 occurs through the medium of a shaft 19, which is arranged vertically in the main cover 1 and may be driven by a motor 20 either in direct fashion or with the assistance of the wheels 21, 22 and 23.

The motor 20 is enclosed on all sides and possesses a short-circuited rotor, and is arranged within a guard casing 24 resting on the base plate 25, which is secured to the main cover. The base plate 25 possesses a hollow space 26 having an opening 27 towards the main cover 1. On the shaft of the motor 20 there is fitted a fan 28, which sucks up air through the aperture 27 and blows the same about the motor and upwards through the intermediate space 29, where the air is able to escape from the casing 24 through the aperture 30.

The drawing or delivery mechanism 5 is operated by the wheel 31, which in turn may be operated by the gear casing 32 through the medium of the wheel 33. In the casing 32 there is provided a worm wheel which may be operated by a worm mounted on the vertical shaft 19.

In the arrangement according to Figs. 1 and 2

the drawing or delivery mechanism 5, the spindle operating shaft 8, and the lifting and lowering device for the spindle rail are operated by the vertical shaft 19.

5 The arrangement according to Figs. 3 and 4 differs from that in Figs. 1 and 2 by reason of the fact that the spindle rail is stationary and the ring rail is moved up and down for the purpose of forming the cops.

10 The spindle rail 3a is mounted on the columns 10a by means of the brackets 12a. In conformity therewith the gear casing 14a is also arranged in fixed manner in the main cover 1, and the shaft 8a is driven by the vertical shaft 19a through the medium of the gear wheels 34 and 35 and the worm wheel 36.

The ring rail 4a rests on casing brackets 37, which are guided on the spindle columns 10a and enclose worm wheels conforming with the worm wheels 11 in Fig. 2. These worm wheels are operated by a worm shaft 13a, which may be driven by a gear box 38. This gear, which may be constructed in accordance with my copending patent application Ser. No. 456,226, filed May 27, 1930, is also operated by the vertical shaft 19a. On the gear casing there may be provided variable speed wheels 39, 40 and 41, which permit of change in the transmission from the vertical shaft 19a to the gear casing 38. The operation of the drawing or delivery mechanism may be performed in the manner described in conjunction with Fig. 1.

In order to more clearly explain the inter-engagement of the single parts, the arrangement will now be described in the following with regard to Fig. 5. According to this embodiment, the spindles 6b in the spindle rail 3b are driven by the shaft 8b through the medium of worm wheels. The spindle rail 3b terminates, however, at the main cover 1b, and the shaft 8b projects through a recess 42 in the main cover. The shaft 8b carries a worm wheel 43, which is operated by a worm wheel 44. This worm wheel 44 is mounted on a vertical shaft 19b, which runs with the lower end in a footstep bearing 45 and with the upper end in a collar 46. At the centre the shaft 19b is guided by means of a bearing 47. Between the worm wheels 43 and 44 there is provided an intermediate wheel 48, which rotates with the shaft 49 in a bearing (not shown) on the spindle rail 3b.

On the shaft 49 there is mounted a gear wheel 50 which operates a gear wheel 53 through the medium of the intermediate wheels 51 and 52. This gear wheel 53 drives a variable speed and reversing gear 54 mounted on the spindle rail 3b. This gear 54 serves to lift and lower the rail 3b as described in conjunction with Figs. 1 and 2. The gear 54 accordingly participates in all movements of the spindle rail 3b necessary for forming the bobbin.

Above the bearing 47 there is mounted by means of screws 56 on the main cover 1b a gear 55 adjustable as regards height. This gear 55 consists of two gear wheels 57 and 58 which, by means of hollow shafts 59, run in bearings of the gear 55. The gear wheel 58 is driven by a worm 60, which is longitudinally displaceable on the shaft 19b by means of a spring and groove. The worm 60 is maintained in its position with respect to the gear by the bearing 61. In the hollow shafts 59 of the wheels 57 and 58 there may be secured in a manner so as to be exchangeable a gear wheel 62. This gear wheel 62 operates the main driving wheel 63 of the drawing or delivery mechanism. By changing the wheels 62 and 63 adjustment may be made for any speed of the drawing or

delivery mechanism. By changing over the wheel 62 in one of the hollow shafts 59 the direction of rotation of the drawing or delivery mechanism may be so varied that upon alteration in the rotation of the spindles 6b, and accordingly of the shaft 19b, the delivery performed by the drawing or delivery mechanism always occurs in the same direction.

The shaft 19b carries at the upper end a gear wheel 64, which is driven by a gear wheel 67 on the shaft 68 of the motor 69 through the medium of a gear wheel 66 mounted on the adjustable shears 65.

In Fig. 5 all parts are shown as exposed; it will be obvious, however, that the same may also be encased, as indicated in Figs. 1-4.

In this embodiment the worm wheel 44 is of such length that the gear wheel 48 remains in engagement therewith in any position of the spindle rail 3b.

In lieu of the motor according to Fig. 5 it is also possible to employ the motor arrangement according to Fig. 1.

The motors are switched on by means of switches 71, of which there is one for each frame section. Each switch is actuated by a shaft 72, which extends transversely across the frame up to the centre of the main bearing cover. At the centre at the meeting ends of the shafts 72 there is provided a coupling sleeve 73, which permits of the shafts 72 being united to form a through-going shaft, so that the two switches may be actuated simultaneously from both sides. After release of the coupling 73 each shaft 72 may be adjusted by means of its corresponding hand lever 74.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the character described, a frame, a spindle operating shaft carried by said frame, a plurality of spindles, a spindle rail connected with said spindles, worm wheels driven by said operating shaft and driving said spindles, a vertical shaft carried by said frame, means for rotating said vertical shaft, a plurality of worm wheels movably mounted on said vertical shaft, a drawing and delivery mechanism, a gear driven by one of the last-mentioned worm wheels and driving said mechanism, and a gear driven by another of the last-mentioned worm wheels and driving said operating shaft.

2. In a device of the character described, a frame, a spindle operating shaft carried by said frame, a plurality of spindles, a spindle rail connected with said spindles, worm wheels driven by said operating shaft and driving said spindles, a vertical shaft carried by said frame, means for rotating said vertical shaft, a worm wheel carried by said vertical shaft and rigidly connected therewith, a toothed wheel meshing with the last-mentioned worm wheel, a gear driven by said toothed wheel and driving said operating shaft, a drawing and delivery mechanism, and means connecting said vertical shaft with said mechanism for driving said mechanism, the last-mentioned worm wheel remaining in contact with said toothed wheel during the movement of said spindle rail.

3. In a device of the character described, a closed frame, a spindle operating shaft carried by said frame, a plurality of spindles, a spindle rail connected with said spindles, worm wheels driven by said operating shaft and driving said spindles, a vertical shaft carried by said frame, a vertical motor carried by said frame and driv-

ing said vertical shaft, means for providing an air current for cooling said motor, said air current originating within said frame and passing outside of said spindles, means connecting said vertical shaft with said operating shaft for driving said operating shaft, a drawing and delivery mechanism, and means connecting said vertical shaft with said mechanism for driving said mechanism.

4. In a device of the character described, a closed frame, a spindle operating shaft carried by said frame, a plurality of spindles, a spindle rail connected with said spindles, worm wheels driven by said operating shaft and driving said spindles, a vertical shaft carried by said frame, a vertical motor carried by said frame and driving said vertical shaft, a guard casing surrounding said motor, a fan driven by said motor and providing an air current circulating between said casing and said motor, means connecting said vertical shaft with said operating shaft for driving said operating shaft, a drawing and delivery mechanism, and means connecting said vertical shaft with said mechanism for driving said mechanism.

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