June 13, 1933. A. SAILER 1,913,616

RING SPINNING AND TWISTING MACHINE

Filed June 22, 1932

Fig. 1

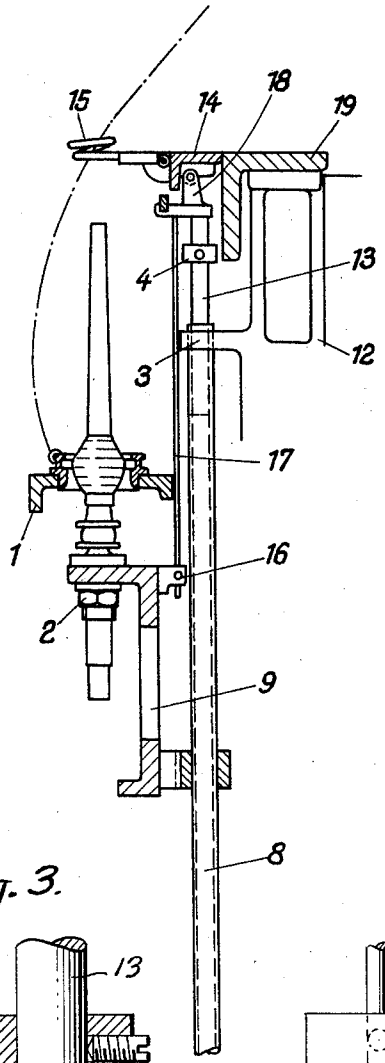


Fig. 2

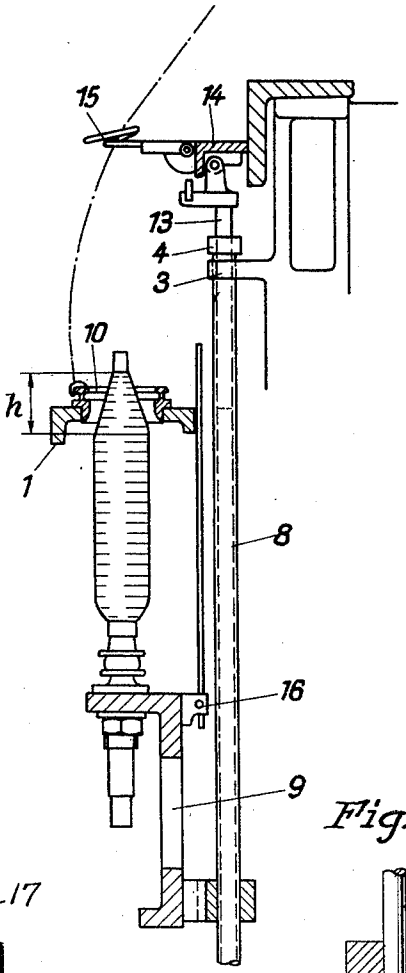
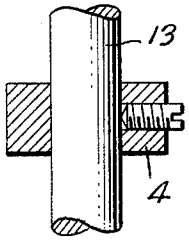


Fig. 3.



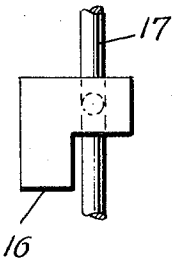
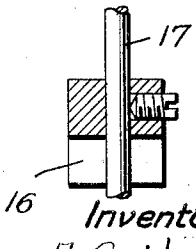


Fig. 4.

Fig. 5.



Inventor:
A. Sailer

By: Marks & Clerk
Attys.

Patented June 13, 1933 1,913,616

UNITED STATES PATENT OFFICE

ADOLF SAILER, OF STUTTGART, GERMANY

RING SPINNING AND TWISTING MACHINE

Application filed June 22, 1932, Serial No. 618,785, and in Germany June 26, 1931.

In point of the cop length to be produced the ring spinning and twisting machines at present in use are restricted to pretty small limits mainly determined by the lowest position of the ring frame and by the position of the thread guide loop. Also, according to experience, the balloon arising in spinning is not to exceed a certain size as otherwise the air resistance and the centrifugal power of the twisting thread parts would cause undesired tensions which could be obviated only by reducing the number of revolutions of the spindle. But by such measures the production is decreased accordingly which is inadmissible. On the other hand the balloon, while spinning, is to have a size more or less constant in order that there may be nearly the same drawing conditions and that the tearing strength of the yarn may remain uniform at the beginning as well as at the end of the cop.

In order to meet these conditions it has been tried to let the ring frame in ring spinning machines, when the thread guide loop is at a standstill, go up and down only as high as the winding stroke and to lower the spindles according to the increasing cop. Other constructions regulate the cop by means of exclusive movement of the flyer or spindles. But in all these cases a comparatively large balloon is forming always when spinning and causing the above described disadvantages whilst of course its constant size is achieved in the second case. In consequence of the large balloon these machines are not very suitable for producing large cops, because of the very frequent thread slippings while working. It is also known to adjust the thread guide loops also upwards in certain reduced proportion to the upwards moved ring frames and rings with stationary spindles. In the initial stage, when producing large cops, a large balloon is also obtained which constantly decreases towards the end of spinning. But in this case the equilibrium is distributed through the constant decrease of the balloon, and the thread guide loops cannot be driven upwards at pleasure because the angle of the thread-course soon assumes unfavorable dimensions in view of the drawing frame. In order to obtain favorable spinning conditions, trials have been made to move the ring frame upwards and at the same time to lower the fly frame. Such arrangement permits to a certain extent to work with large cops, but the tension of the thread gradually decreases, which is again undesirable.

The object of the present invention is a ring spinning and ring twisting machine in which, for the purpose of forming cops of extraordinary great length, the spindle rail is gradually adjusted downwards and the distance between thread guide loops and ring frame is reduced.

The invention consists in the thread guide rail resting on rods going downwards with the spindle rail and following their movement until, when reaching a certain distance from the ring frame, performing but the winding stroke necessary for perfect spinning, comes to rest on locally firm stops. At the commencement of spinning a large balloon is of course also forming in consequence of the long spindles and the great distance of the ring frame from the thread guide loops. But as soon as the thread guide rail moving downwards with the spindle rail comes to rest on the locally firm stops, the thread balloon and with it the thread tension alters only according to the position of the ring frame which merely carries out the winding stroke. Consequently it is possible to finish the cop at an almost invariable thread tension. It is therefore possible to produce also soft-twist yarn on this machine.

The accompanying drawing is to give an example of how the object of this invention may be carried out.

In the drawing, Figure 1 is a view of the apparatus, partly in elevation and partly in section, showing the spindle rail and the thread-guide rail in their initial positions, at the beginning of a cop-winding operation. Figure 2 is a similar view, showing the relation of the parts at the completion of a winding operation. Figures 3, 4 and 5 are detail views of the clamping means for holding several of the parts in their adjustments.

The spindle rail 9 is moved downwards with the spindle 2 along guides 8 while spin-

ning. Guides 8 are fixed in parts 3 of frame 12. These guides 8 are holding the adjustable thread guide carriers 13 of the thread guide rail 14 to which loops 15 are fixed. Spindle rail 9 is provided with holders 16 with which rods 17 are adjustably connected. The latter are supporting head 18 of carrier 13 and with it the thread guide rail 14 and the loops 15. The carriers 13 are also provided with an adjusting ring 4.

When spinning is started the machine is in the position of Fig. 1. The spindle rail 9 is at the top and, by means of holders 16 and rods 17, holds the thread guide loops 15 with rail 14 and its carriers 13 at the height of the drawing frame 19. With the increase of the cop all these parts are descending until the adjusting ring 4 touches the guide tube 8 above part 3. At this moment the downward movement of the thread guide loops 15 ceases while spindle rail 9 with spindles 2 sinks further (Fig. 2). During the whole time the ring frame makes a movement within the limits indicated at *h*, Fig. 2, to perform the winding stroke proper. The raising and lowering of the spindle rail and of the ring frame is effected by known means such as stroke rods or chains in connection with rollers or toothed wheels or toothed bars.

I claim:

1. In a cop-winding apparatus, the combination of a vertically movable spindle rail, with a vertically movable thread-guide rail, a fixed vertical guide, a head slidably mounted on the upper end of the fixed vertical guide to engage the under side of the thread-guide rail, means limiting the downward movement of the head on the fixed vertical guide so that the downward movement of the thread-guide rail coincides with the initial downward movement of the spindle rail, and a vertical rod attached at its lower end to the spindle rail and with its upper end positioned to engage the head when the spindle rail is raised to its initial position, the rod engaging the head operating to maintain the thread-guide rail in spaced relation to the spindle rail during the first part of the downward movement of the spindle rail and within the limits of the downward movement of the head on the fixed vertical guide.

2. In a cop-winding apparatus, the combination of a vertically movable spindle rail, with a vertically movable thread-guide rail, a fixed vertical guide having a tubular upper end, a head engaging the under side of the thread-guide rail and having an extension slidable in the tubular upper end of the fixed vertical guide, a stop adjustable on the head extension to engage the upper end of the fixed vertical guide to limit the downward movement of the head and the thread-guide rail, and a vertical rod adjustably mounted at its lower end to the spindle rail and with its upper end positioned to engage the head when the spindle rail is raised to its initial position, the rod engaging the head operating to maintain the thread-guide rail in spaced relation to the spindle rail during the first part of the downward movement of the spindle rail and until the adjustable stop on the head extension engages the upper end of the fixed vertical guide.

In testimony whereof I have signed my name to this specification.

ADOLF SAILER.