May 19, 1931. H. TANNER 1,806,098

SPEED CONTROL APPARATUS FOR SPINNING MACHINES

Filed Feb. 6, 1926

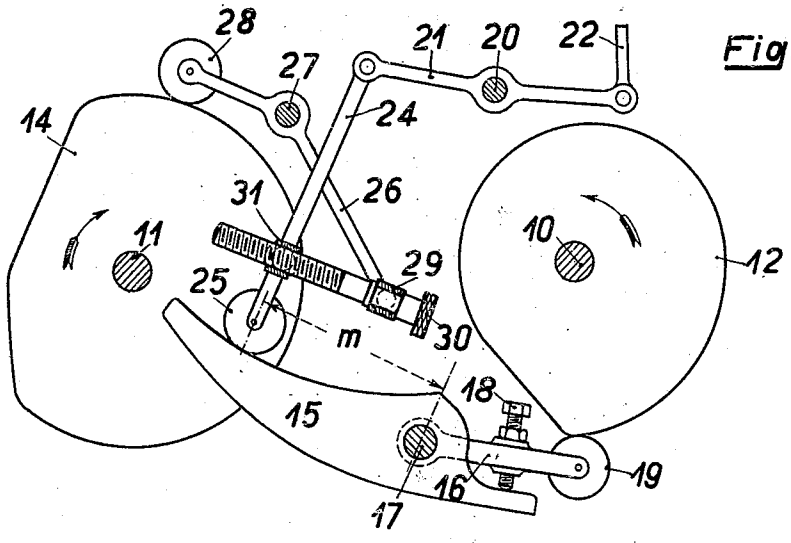

Fig.1.

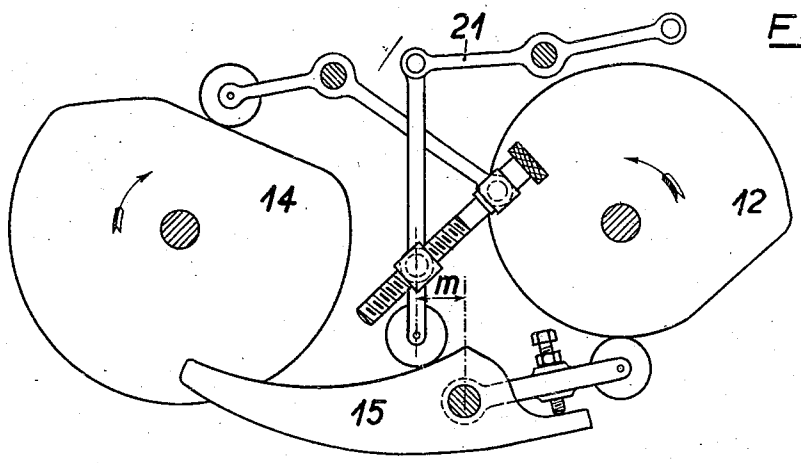

Fig.2.

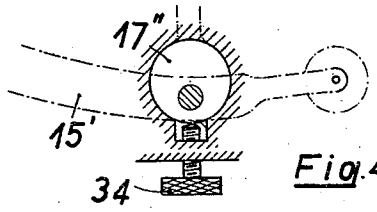

Fig.4.

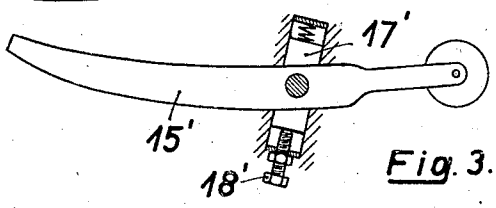

Fig.3.

Heinrich Tanner
Inventor

By Connell, Reist & Warden
Attorneys.

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UNITED STATES PATENT OFFICE

HEINRICH TANNER, OF BADEN, SWITZERLAND, ASSIGNOR TO AKTIENGESELLSCHAFT BROWN BOVERI & CIE., OF BADEN, SWITZERLAND, A JOINT-STOCK COMPANY

SPEED CONTROL APPARATUS FOR SPINNING MACHINES

Application filed February 6, 1926, Serial No. 86,594, and in Germany February 7, 1925.

This invention relates to apparatus for controlling the speed of operation of ring spinning machines, and is in the nature of an improvement on the apparatus disclosed in United States Letters Patent to Honig No. 1,178,447 of April 4, 1916.

The general object of the present invention is the provision of a regulating apparatus which will greatly facilitate the installation and fitting and proper co-ordination of the speed regulating means with the spinning machine.

Another object is the provision of means for adjusting the timing relationship of the machine and actuating motor.

Other and further objects will be pointed out or indicated hereinafter, or obvious to one skilled in the art upon an understanding of the present disclosure.

It will be understood that in accordance with the disclosure of the above mentioned patent, provision is made for varying the speed of the driving motor in accordance with the movement of the ring rail of the spinning machine, such variation in speed being accomplished through the medium of properly formed cams which are operated in accordance with the vertical movements of the ring rail during operation. One cam operates in accordance with the reciprocating movement of the ring rail which takes place repeatedly during the spinning of the yarn and its winding on the successive conical layers of the cop, and the other cam is operated in accordance with the progressive movement of the ring rail as it is raised to build up the entire cop. Heretofore it has been necessary to form the cams specially for each installation, which has required a cut-and-try procedure involving individual filing of the cams in order to give them the proper shape and size to obtain the desired speed regulation.

The present invention obviates the necessity of this troublesome and expensive procedure in installation, by making it possible to use cams of standard or uniform profile and obtain the regulating effect desired in the several installations, by means of adjustable interconnecting means between the cams and the motor regulating device.

In the accompanying drawings forming a part of this specification is shown one form of device representing an embodiment of the invention, but it is to be understood that the same is here presented for illustrative purposes only as the invention is susceptible of embodiment in many other forms all within the scope of the appended claims.

In the drawings,

Fig. 1 is an elevational view of the apparatus showing the cams in one position;

Fig. 2 is a similar elevational view showing the cams in another position; and

Figs. 3 and 4 are details showing various forms of mounting for the guide lever.

Referring to the form here presented for illustration of the invention, let it be understood, that the numeral 10 designates a shaft which is rotated in accordance with the reciprocating operation of the ring rail, and 11 designates another shaft which is operated in accordance with the progressive movement of the ring rail. The shaft 10 carries the cam 12 and the shaft 11 carries the cam 14, the profile forms of which are designed with respect to the intended speed variations. The speed control or guide lever is formed of the portions 15 and 16, both pivoted on the centre 17 and have an adjustable connection by means of set screw 18, whereby their angularity may be varied. The portion 16 carries the roller 19 which bears on the profile of the cam 12 so that the guide lever can be rocked by rotation of the cam.

On the centre 20 is pivoted the regulating lever 21, which is connected at one end with the element 22 which operates the speed varying means of the motor which operates the spinning frame. Pivoted to the other end of the regulating lever 21 is the transmission link 24 which carries at its lower end the roller 25 which bears on the arcuate margin the guide lever 15. By virtue of this connection, it will be seen, the rocking of the guide lever will be effective to rock the regulating lever 21. The lever 26 is pivoted on the centre 27 and carries at one end the roller 28 which rides on the profile of the cam 14. The other end of the lever 26 is pivoted to a sleeve 29 which forms a mounting for the

rotatable adjusting screw 30. On this screw travels a nut 31 which is pivoted on the link 24. Rotation of the screw 30, therefore, will be effective to adjust the nut 31 towards or from the sleeve 29 and accordingly vary the point of engagement of the roller 25 upon the guide lever 15.

By virtue of the arrangement, it will be seen, the effectiveness of the respective cams upon the control lever 21 may be varied by the adjustment of the screws 30 and 18. The adjustment of the screw 30 varies the effective lever arm *m* of the guide lever by which the movement of the roller 19 is transmitted to the link 24, regulating lever 21 and regulating connection 22. The shorter *m* is, the smaller will be the displacement of the regulating connection 22 and consequently the less will be the amplitude of the periodic speed variation of the motor attendant upon the reciprocating movement of the ring rail. The adjustment of the screw 18 is effective to vary the total height of the speed curve, i. e., the base speed of the motor, for a given spinning operation. According to the angularity of the guide lever arms 15 and 16, the normal position of the roller 25 will be higher or lower, resulting in the positioning of the regulator connection 22 to obtain a higher or lower basic motor speed.

Fig. 2 shows the relative position of the parts at the point of minimum cam throw, as distinguished from Fig. 1 which shows them at the point of maximum cam throw.

In Figs. 3 and 4 are shown other arrangements for accomplishing adjustment of the guide lever, wherein the adjustment is accomplished by displacement of the fulcrum of the lever. In the form shown in Fig. 3 the lever is fulcrumed on a sliding block 17′ which is adjustable in its mounting by means of the screw 18′, while in Fig. 4 the lever is eccentrically fulcrumed on a rotatable member 17″ which is held in position by the screw 34.

By virtue of the improved control arrangement, not only are the cost and inconvenience of specially forming and filing the cams for each installation obviated, but also a desirable flexibility and latitude obtained for variation of the speed regulation as desired for different conditions of operation or output.

What I claim is:

1. In speed control apparatus for spinning machines, a member supported for oscillatory movement and provided with a bearing edge, cam means for imparting such movement to said member, a transmission element supported in engaging relation with said edge and for such movement with said member and for movement with respect to said edge such as to vary its point of engagement therewith, cam means for imparting movement to said element with respect to said edge, means providing an operative connection between said element and said second-named cam means, and means forming part of said connecting means and being operable to provide for relative adjusting movement between the same and said element; said adjusting means comprising a sleeve carried by said connecting means, a screw rotatably mounted in said sleeve, and a nut receiving said screw and being carried by said transmission element.

2. In speed control apparatus for a spinning machine including a control member adapted for oscillation to control the speed of said machine, a first cam operative responsive to and in accordance with the speed of said machine, a second cam also operative responsive to and in accordance with the speed of said machine, a lever associated with and actuated responsive to actuation of said first cam, a lever associated with and actuated responsive to actuation of said second cam, a linking member interconnecting said control member with said levers, and means for adjusting said levers with respect to said linking member whereby actuation of said control member may be varied in accordance with the actuation of said levers responsive to the conjoint actuation of said cams to effect speed variation of said machine.

3. In speed control apparatus for a spinning machine including a control member adapted for oscillation to control the speed of said machine, a first shaft adapted for rotation in accordance with the movement of one element of said machine, a second shaft adapted for rotation in accordance with the movement of another element of said machine, a cam affixed to each said shaft, a lever associated with and actuated responsive to movement of one of said cams, another lever associated with and actuated responsive to movement of the other of said cams, a linking member interconnecting said control member with said levers, and means for variably adjusting said levers with respect to said linking member whereby the oscillations of said control member may be varied in dependence on the conjoint movement of said levers responsive to movement of the said shafts.

In testimony whereof I have hereunto subscribed my name at Zurich, Switzerland, on the 20th day of January, A. D. 1926.

HEINRICH TANNER.