United States Patent [19]

Ruegg

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[54] **THREAD-GUIDE CONTROL APPARATUS**

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[52] **U.S. Cl.** **242/43.1**

[51] **Int. Cl.** **B65h 54/32**

[58] **Field of Search** 242/43.1, 43

[56] **References Cited**

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[57] **ABSTRACT**

A thread-guide is reciprocated along a support rod opposite a bobbin to be wound and is pivoted by a guide rail rotatable by control means including drive means and a control shaft. The control shaft and support rod may extend along adjacent a plurality of winding stations and the drive means may be common to all stations.

1 Claim, 3 Drawing Figures

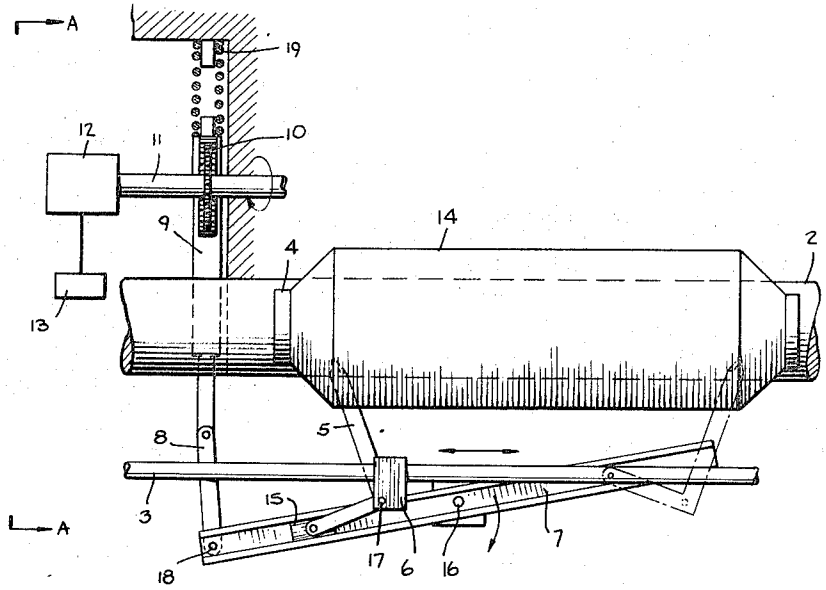

Fig. 1.

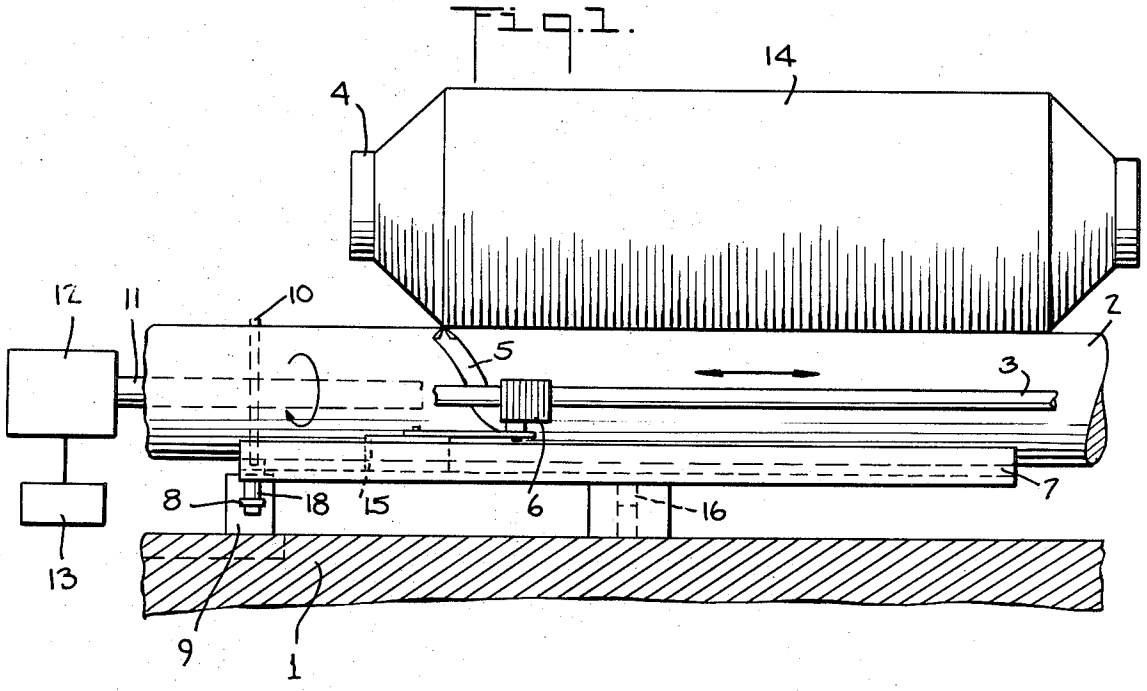
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Fig. 2.

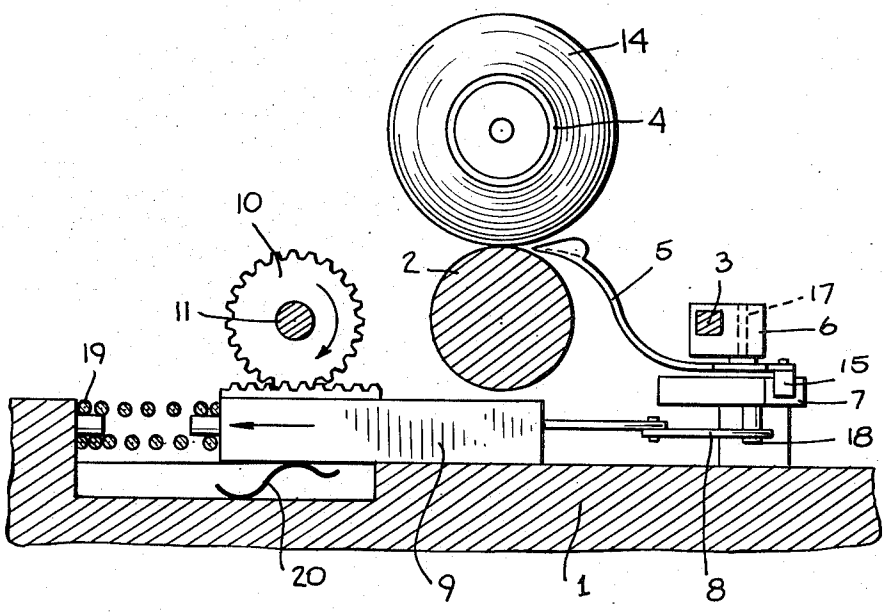
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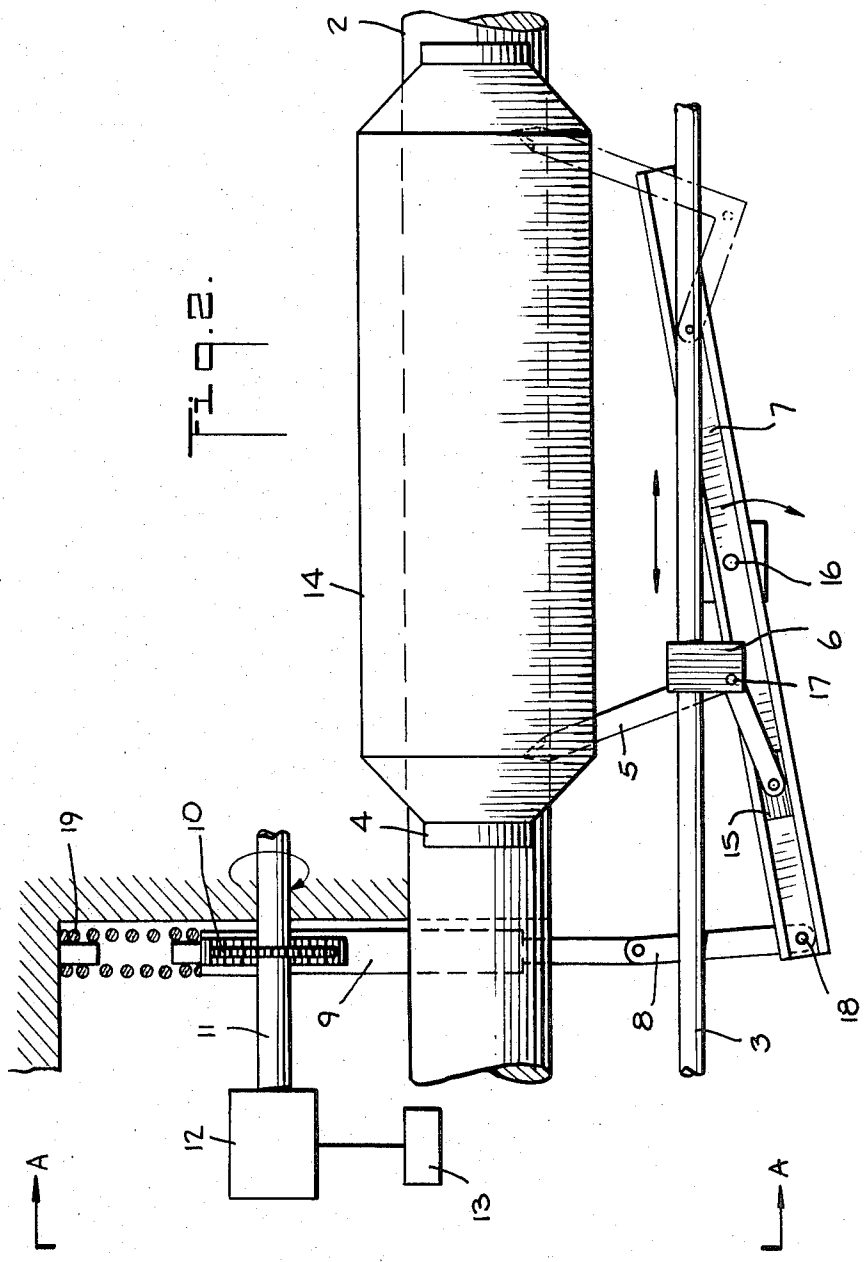
Fig. 2.



THREAD-GUIDE CONTROL APPARATUS

This invention relates to guide means for winding thread, yarn, ribbon and the like, and more particularly to attendant apparatus for altering the stroke of the guide member.

Thread winding apparatus with reciprocating thread-guides are known in which the thread-guides are mounted on a support rod which is reciprocated, and which is guided by the curved groove of a drum rotating around its axis. In an apparatus of this type, an installation for changing the stroke of the thread-guide is provided which consists of an articulated triangle, one lever of which is joined with one end of the support rod and another lever of which is guided in the curved groove. The articulated triangle is furthermore joined with a sliding weight which can be moved in a guide rail by means of a cog-segment, the guide rail being moveable like a two-armed lever around a static bearing rivet, and the cog-segment being engaged with a cog-wheel which is itself associated with a stroke varying drive. The stroke is varied by rotating the guide rail.

It is the purpose of the present invention to provide an improved apparatus of this type. The invention, therefore, is concerned with apparatus for varying the stroke of the thread-guides in a winding station of a machine for the treatment of threads, yarns, ribbons and the like, and comprise a support bar for the thread-guides which is reciprocated by means of a curved element with which it is joined, and a guide rotatable by means of adjusting members, in which an element joined with the thread-guide is guided. This invention is characterized in that a control shaft which extends over the totality of the winding stations of the machine and which is driven by means of central drive is provided, on which a control element is rigidly fixed for each winding station which effects rotation of respective guide rails via adjusting elements joined with the control element. In a particular case, the central drive means may consist of an impulse-controlled electric motor. Accordingly, the strokes of the thread-guides at each statiion of a multi-station winding machine may be varied simultaneously.

There has thus been outlined rather broadly the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of the invention. It is important, therefore, that the claims be regarded as including such equivalent construction as do not depart from the spirit and scope of the invention.

A specific embodiment of the invention has been chosen for purposes of illustration and description, and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a front elevational view of one winding station and illustrating the present invention;

FIG. 2 is a top plan view of the apparatus of FIG. 1; and

FIG. 3 is a side elevational view taken along the line A—A of FIG. 2.

Referring now to the drawings and particularly to FIGS. 1 and 2, it will be seen that the apparatus of the present invention is mounted on the winding rod 1 of the machine. The winding spool 4 is supported by means, not shown, on which the bobbin 14 is to be built up during the winding procedure. The bobbin 14 is driven by frictional contact with a winding shaft 2, which extends across the entire length of the machine and is used for all the winding stations. The winding shaft 2 is driven by a drive gear, not shown. For guiding the thread to be wound up and for exactly depositing the same on the bobbin body, a thread-guide 5 is used, and this is pivotally mounted, as at 17 (FIGS. 2 and 3), on a support block 6 which itself is fixed on the support rod 3 and is reciprocated by the same across a constant distance corresponding to the basic stroke. The support rod 3 is guided in the curved groove of a curved drum, not shown. On the free end of the thread-guide 5, there is a pivot 15 which may slide along the guide rail 7. The guide rail is connected to the shaft 16 for pivotal movement relatively thereto. Depending on the angular position of the guide rail 7, the pivot 15 slides between different positions and thereby causes the thread-guide 5 to pivot around the axis of rotation 17 in the support block 6.

An articulated lever 8 is pivotally connected to the left end of the guide rail 7, as viewed in FIGS. 1 and 2; and the other end of the lever 8 is rigidly joined to a cog bar 9. The cog bar 9 is engaged with the cog-wheel 10 provided on a control shaft 11, which extends across the entire length of the machine, and which is used for all the winding stations. This shaft 11 is driven at very low speeds of revolution by means of an impulse-controlled motor 12, the variations of speeds of revolution being effected gradually. The control of the power stage of the motor 12 is, in turn, effected by means of a control unit 13, which contains a variable impulse emitter able to furnish between one and 50 impulses per 2 minute interval, for example, and means for impulse prolongation. The motor 12 may be provided in the marginal support (not shown) of the machine, directly at the control shaft, and the control unit 13 may be placed independently therefrom in the circuitry case of the machine.

At the beginning of the winding procedure, the guide rail 7 assumes an angular position in which the thread-guide is moved at maximum stroke. The control shaft 11 and cog-wheel 10 are then made to rotate slowly by means of motor 12, which movement is transferred from the cog-wheel 10 to the cog bar 9, which is thereby displaced longitudinally and transfers its movement to the articulated lever 8 which, in turn, causes a corresponding pivotal movement of the guide rail 7 about the pivotal axis 16. In this manner, the stroke of the thread-guide 5 is successively shortened and a bobbin 14 with conical marginal portions (double-conical cylindrical bobbin) is provided.

The cog bar 9 can be disengaged from the cog-wheel 10 by downward pressure against the force of the spring 20, and may be returned to its original position by means of the force of the spring 19. Thereby, it will be seen that the position of the guide rail can be adjusted separately for each winding station.

I believe that my novel apparatus will now be fully understood, and that its advantages will be appreciated by those persons skilled in the art.

I claim:

1. Apparatus for simultaneously varying the stroke of thread-guides at a plurality of winding stations of a machine for the winding of threads, yarns, ribbons or the like, and having a common thread-guide support rod extending along said plurality of winding stations and connected with means for effecting reciprocating movement of same, said apparatus for each winding station comprising a guide rail medially pivotally mounted, a support block fixed on said thread-guide support rod for reciprocating motion therewith, an L-shaped thread-guide for guiding the thread to be wound at the end of one arm thereof, said L-shaped thread guide being medially pivotally mounted on said support block, a pivot member slidably mounted on said guide rail, the end of the other arm of said L-shaped thread guide being pivotally mounted on said pivot member, a control shaft extending across each winding station of the machine rotatable in step-wise fashion, a cog-wheel rotatable by said control shaft, a cog bar engaging said cog wheel, means mounting said cog bar for selectively engaging said cog wheel, an articulated bar connecting said cog bar and said guide rail to effect pivotal movement of said guide rail, and spring means for maintaining said cog bar and said cog wheel in engagement whereby said cog bar may be disengaged from said cog wheel so that the position of the guide rail can be adjusted separately for each of said winding stations.

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