

July 15, 1941.

J. KÜPPERS

2,249,147

QUICK TRAVERSE WINDING FRAME

Filed July 7, 1939

Fig. 1.

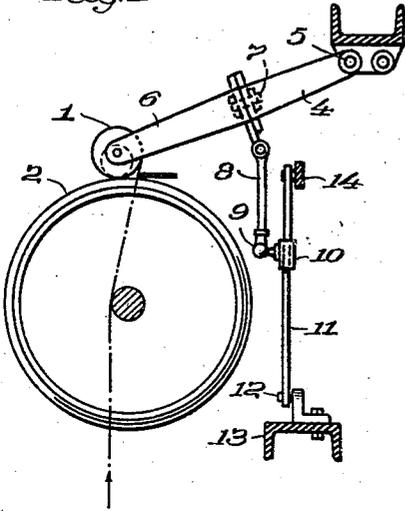


Fig. 3.

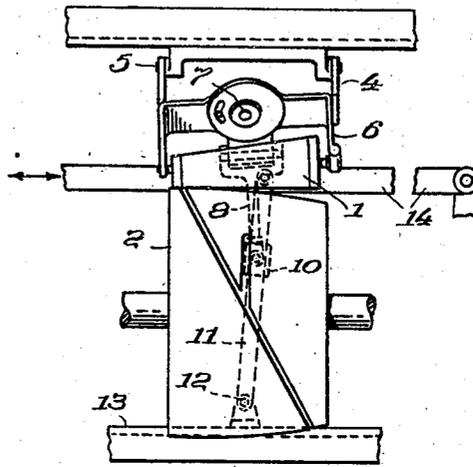


Fig. 2.

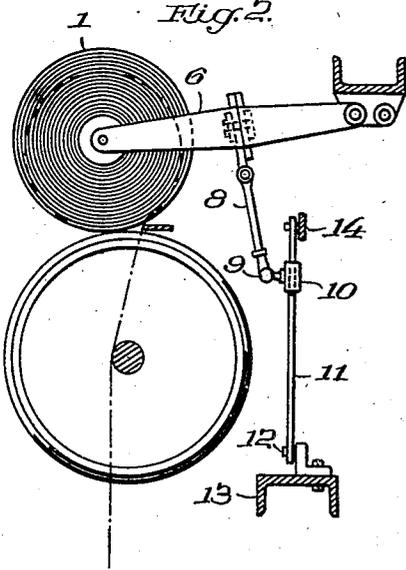


Fig. 4.

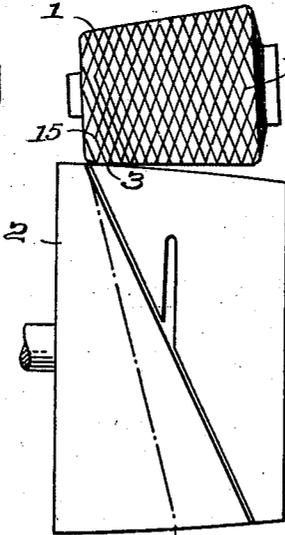


Fig. 5.

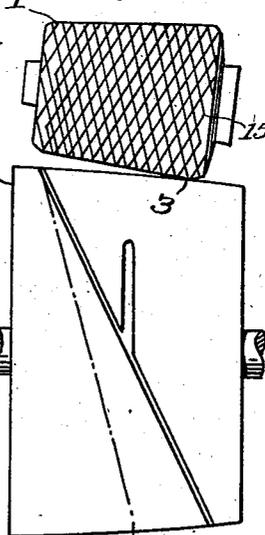
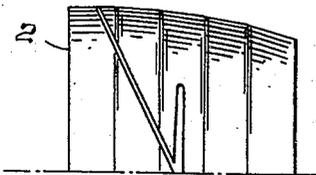


Fig. 6.



Inventor:

Josef Küppers

4  
Friedrich  
his attorney

# UNITED STATES PATENT OFFICE

2,249,147

## QUICK TRAVERSE WINDING FRAME

Josef Küppers, Gladbach-Rheydt, Germany

Application July 7, 1939, Serial No. 283,231  
In Germany November 3, 1937

3 Claims. (Cl. 242—43)

This invention relates to a quick traverse winding frame with bobbins driven by slotted or cam drum.

For the purpose of avoiding the so-called "ribbon formation" various proposals have been made in connection with these quick traverse winding frames, without, however, having brought any satisfactory result. By the term "ribbon formation" is understood the superposed or closely juxtaposed winding of several layers of thread.

In addition to other disadvantages all the proposals were open to the same objection, namely that between the driving drum and the bobbin a very undesirable, relatively strong friction occurred which evidently must have a particularly disadvantageous effect when winding fine, delicate yarns. When winding fine yarns, especially cellulose wool yarns, it is, however, particularly important to wind without "ribbon formation" both for tightly wound bobbins for warp purposes and also for loosely wound bobbins for dyeing purposes.

The same disadvantages are present in a quick traverse winding frame of the above mentioned type in connection with which it has been proposed, in order to avoid the "ribbon formation," to allow the bobbin to carry out a rocking movement on the driving drum,—on a cylindrical drum when producing conical bobbins and on a conical drum when producing cylindrical bobbins,—an alternation in the number of revolutions of the bobbin being obtained by the alternating contact of the left and right edges of the bobbin. At the same time the driving point on the bobbin always is displaced from the edge of the bobbin of small diameter to the larger diameter of the bobbin or drum. The speed of the bobbin had to change very suddenly which, on account of the natural speed of the bobbin, could not be carried out without damaging the yarn and during which changing the most delicate portions of the bobbin, namely its edges, were considerably affected, quite apart from the fact that neither a perfect laying of the thread layers was attained nor is a "ribbon formation" prevented.

The invention has for its object not only to avoid the above mentioned disadvantages of the known machines but to produce a quick traverse winding frame with bobbins driven by slotted or cam drum, in which "ribbon formation" is perfectly and reliably prevented and all additional detrimental friction is eliminated. In addition hereto it is intended to eliminate friction within the bobbin, which friction is unavoidable when

winding conical bobbins, and at the same time to effect, without separate means, a displacement of the threads at the bobbins edges, which, it will be recognized, is equally advantageous for tightly and loosely wound bobbins.

This is attained by a quick traverse winding frame with bobbin driven by a slotted or cam drum and carrying out a rocking movement on this drum, which frame is characterized according to the invention, in that the driving drum has its outer surface converging from one end to the other and of arcuate form lengthwise, said bobbin resting on and being engaged by said drum. Owing to the fact that the bobbin carries out its rocking movement not on a flat conical drum surface as heretofore, but on a slightly curved surface, the speed of the bobbin increases and decreases gradually between maximum and minimum without any detrimental friction being exerted on the bobbin.

Other details and features of the invention are illustrated in the accompanying drawing which shows, by way of example, a quick traverse winding frame with bobbins driven by split drums.

Fig. 1 shows the frame in side elevation,

Fig. 2 shows a portion of the frame on a larger scale in side elevation,

Fig. 3 is a front view of Fig. 1,

Figs. 4 and 5 are front elevations on a larger scale showing the bobbin in different positions,

Fig. 6 is a part elevation of a driving drum of modified construction.

In the drawing 2 designates a rotary slotted drum of a quick traverse winding frame which drives by peripheral friction a cross-wound bobbin resting thereon. The split drum is constructed like a collote-shaped cup and has its outer surface converging from one end to the other and of arcuate form lengthwise. The bobbin mounted in a bobbin holder can carry out a crosswise rocking movement on the drum 2. The bobbin holder for this purpose consists of a front part 6 and of a rear part 4, the two parts being hingedly connected by a bolt 7 and oscillatable about an axle 5 mounted on the frame of the machine. The front part 6 of the bobbin holder can rotate about the axle 5 which is perpendicular to the slotted drum axis. A link 8 is connected at one end to the front bobbin holder part 6 by a bolt 7 and at its other end to a joint 9 on a guide 10 slidable on a movable control bar 11 oscillatable about a bolt 12. The control bars 11 for all the bobbin holders are mounted on the machine frame 13 and driven together or in groups by means of a reciprocating rod system 14

by a separate driving mechanism at a certain ratio to the speed of the slotted drum 2 and adjustable according to the size of yarn. Thus, the bobbin holder and consequently the bobbin, which theoretically contacts with the slotted drum only at the point 3 but in practice on a narrow surface, carry out a crosswise rocking movement during which the speed of the driven bobbin changes in a continuous value determined by the ratio between the contacting drum diameter and the bobbin diameter (see Figs. 4 and 5). As the change in the speed of the bobbin increases or decreases slowly and continually, all injurious friction is avoided and the yarn layers 15 are not damaged, the edges of the bobbin in particular being protected perfectly because the rocking movement of the bobbin holder can be so arranged that the edges do not come at all or only slightly into contact with the surface of the drum. By arranging the pivot bolt 12 of the control bar 11 at a lower level than the point of connection between the guide 10 and the link 8, the swinging movement of the front part 6 of the bobbin holder will become greater as the bobbin diameter increases in size. By correctly choosing the position of the bolt 12, it is therefore possible to keep the increase in the oscillating movement within the proper limits. Consequently, the advantage is automatically obtained that, in the case of conical bobbins of small diameter, when the change in the speed of the bobbin in any case acts more strongly, the oscillating movement is smaller, but in the case of large bobbin diameter it is greater. It is easily possible, by inclining the control bar 11 to the frame part 13, to adjust the front part 6 of the bobbin holder continually more and more steeply, as the bobbin increases in diameter, without influencing the rocking movement and to thus obtain so-called "super cones," that is bobbins with continually increasing conicity such as are preferably used for knitting purposes. During the rocking movement of the bobbin the bobbin edges continually change their position relatively to the thread guiding of the drum. Consequently, a displacement of the thread layers 15 is attained at the edges, which is in itself known, but in the present instance is attained automatically without special measures.

The form of construction illustrated in the drawing and above described is only given by way

of example and can be carried out in any other manner equivalent in principle, essential is only the slightly crowned surface construction of the split or cam drum with simultaneous rocking movement of the bobbin. It is immaterial for the inventive idea whether the slotted drum has a smooth slightly curved surface as shown in Figs. 3 to 5 or whether a slightly crowned surface is formed by a plurality of facets as shown in Fig. 6.

The invention can be applied, not only to slotted and cam drum quick traverse winding frames but also to machines of the thread guide system or the like, wherein the bobbin and the thread guide are driven separately.

I claim:

1. In a quick traverse winding frame, a slotted drum, a bobbin resting on and driven by said drum, means for imparting a crosswise rocking movement to said bobbin in proportion to the continually changing diameter of the bobbin, said drum having its outer surface converging from one end to the other and of arcuate form lengthwise, said bobbin resting on and being engaged by said drum surface.

2. In a quick traverse winding frame, a slotted drum having its outer surface converging from one end to the other and of arcuate form lengthwise, a bobbin resting on and being engaged by said drum surface, an oscillatable bobbin holder carrying said bobbin, a link connected at one end to said holder, a guide on the other end of said link, a control bar slidably engaging said guide, and a driving mechanism connected to said control bar.

3. In a quick traverse winding frame, a slotted drum having its outer surface converging from one end to the other and of arcuate form lengthwise, a bobbin resting on and being engaged by said drum surface, an oscillatable bobbin holder carrying said bobbin, a link connected at one end to said holder, a guide on the other end of said link, a control bar slidably engaging said guide, a driving mechanism connected to one end of said control bar, the lower end of said control bar connected to a stationary bearing point, and means for displacing the lower end of said bar on said bearing point for inclining said control bar relative to said bearing point.

JOS. KÜPPERS.