Feb. 12, 1935. H. SCHWEITER 1,990,620

TRAVERSE THREAD WINDER

Filed June 16, 1934 3 Sheets-Sheet 1

Fig. 1

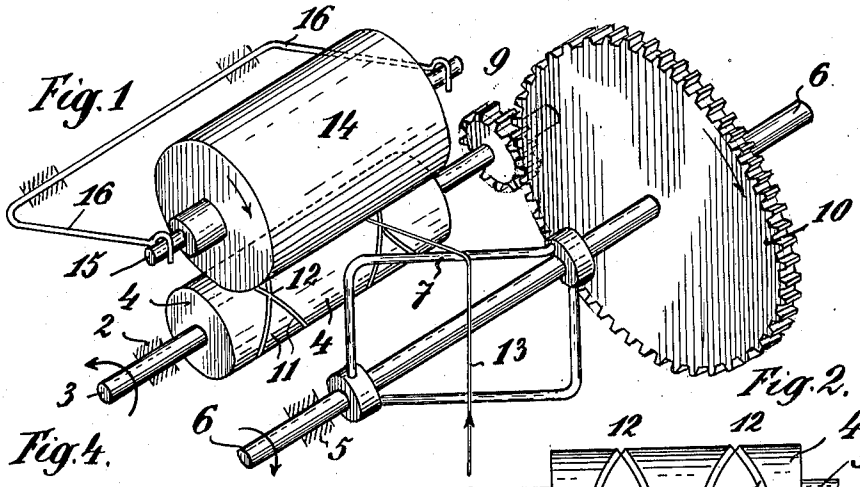



Fig. 2.

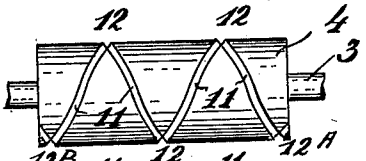



Fig. 4.

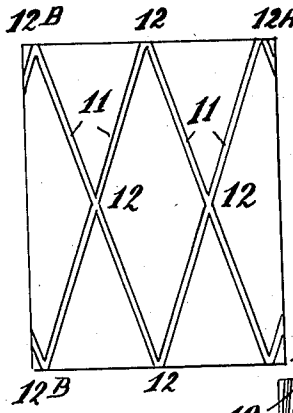



Fig. 3.

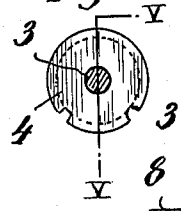
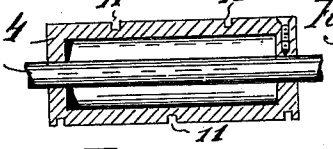



Fig. 5.



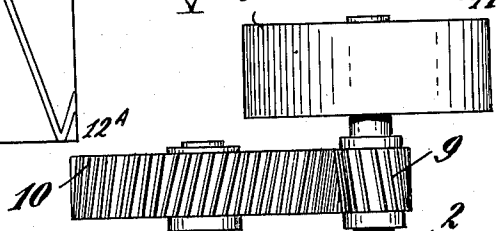
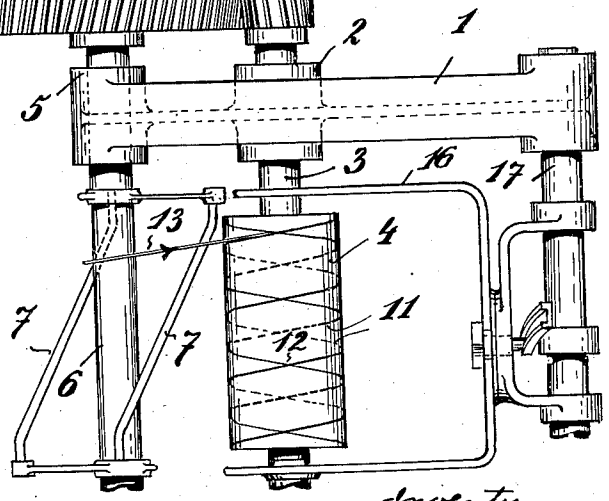




Fig. 14.




Inventor,
Hans Schweiter,
By Knight Bros.
His attorneys

Feb. 12, 1935. H. SCHWEITER 1,990,620

TRAVERSE THREAD WINDER

Filed June 16, 1934 3 Sheets-Sheet 2

Fig. 6.

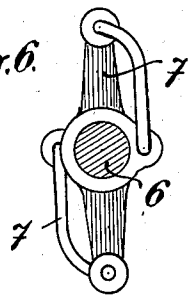



Fig. 7.

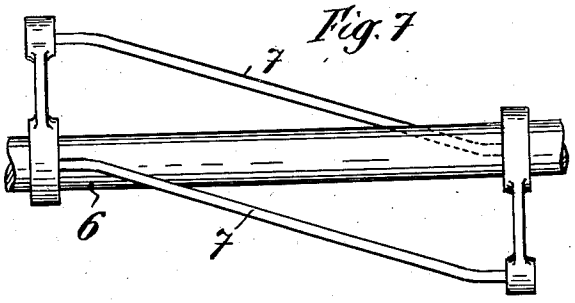



Fig. 8.

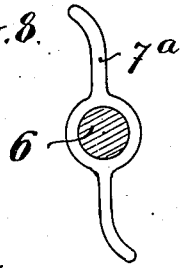



Fig. 9.

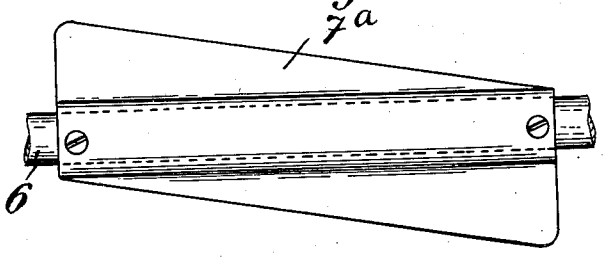



Fig. 10.

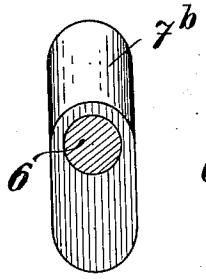



Fig. 11.

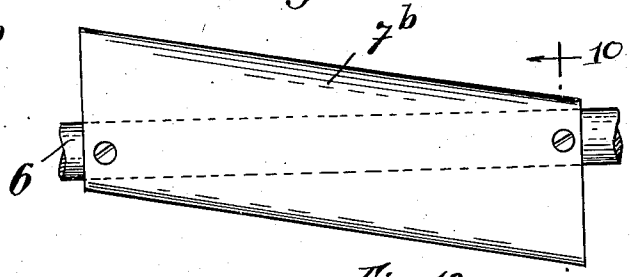



Fig. 13.

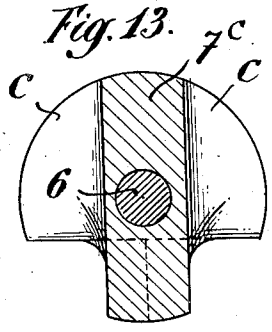
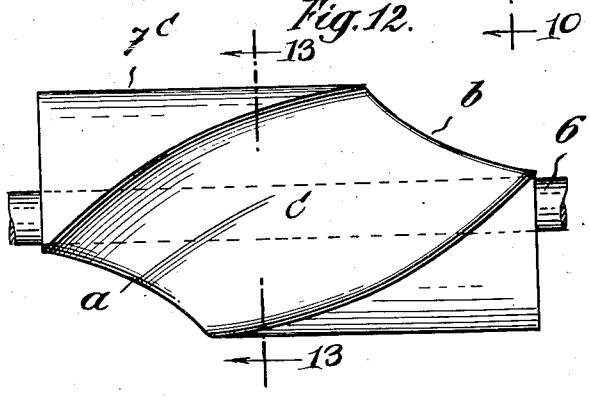



Fig. 12.




Inventor
Hans Schweiter
By Knight Bros
His Attorneys

Feb. 12, 1935. H. SCHWEITER 1,990,620

TRAVERSE THREAD WINDER

Filed June 16, 1934 3 Sheets-Sheet 3

Fig. 15.

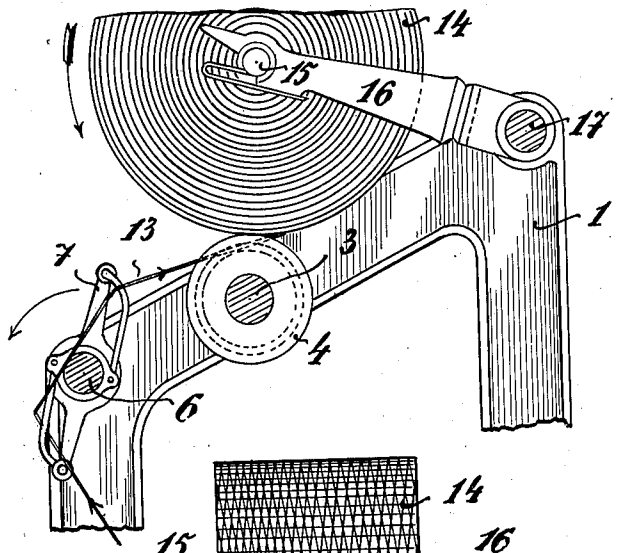
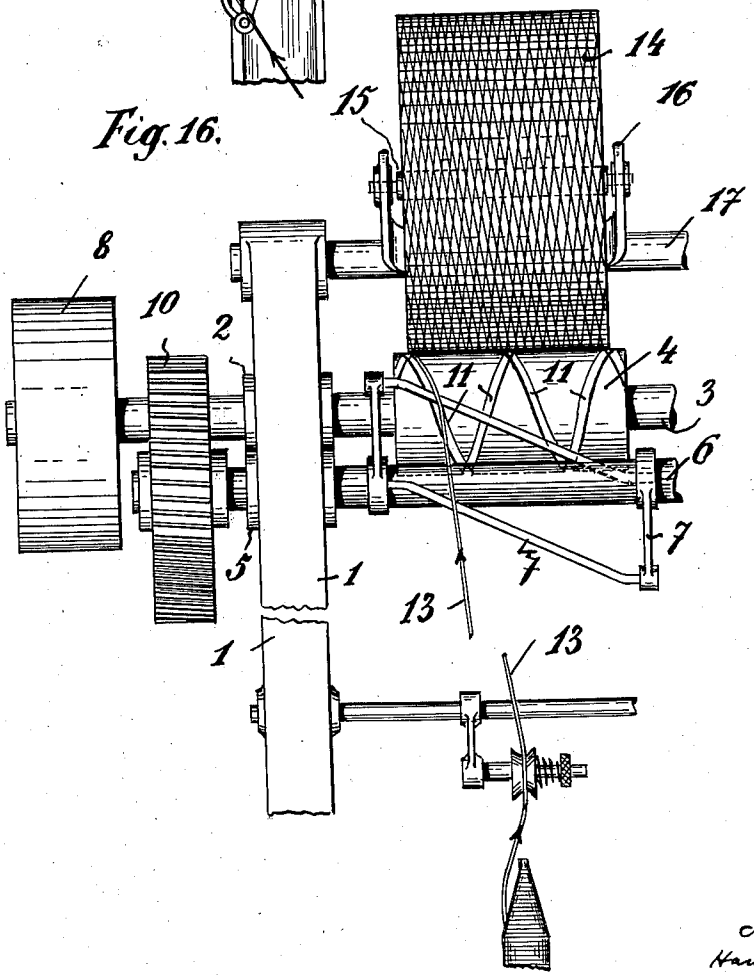



Fig. 16.




Inventor
Hans Schweiter
By Knight Bros
His attorneys

Patented Feb. 12, 1935

1,990,620

# UNITED STATES PATENT OFFICE

1,990,620

## TRAVERSE THREAD WINDER

Hans Schweiter, Horgen, near Zurich, Switzerland

Application June 16, 1934, Serial No. 730,957
In Switzerland June 27, 1933

5 Claims. (Cl. 242—43)

My invention relates to traverse thread winders with a grooved drum and a separate thread guide arranged in front thereof.

With traverse thread winders in which the thread is guided by a grooved drum breakdowns easily occur because the thread runs wrong on the crossings of the grooves. Besides, the engraving of the grooves in the drum is comparatively difficult, since the two right- and left-handed grooves must go over into one another at the ends of the drum, in order to obtain reversal of the thread. Furthermore, the cross section and depth of the grooves must vary, to achieve in some measure satisfactory operation. The manufacture of the drums therefore is also comparatively expensive.

It has been suggested to provide in front of the grooved drum a normal to and fro moving thread guide the object of which is to guide the thread on the crossings of the grooves. Such an auxiliary thread guide, however, suffers from all drawbacks of members of this kind, that means, it admits only comparatively low speeds and is not self-threading and, consequently, every thread guide must be driven separately. These features increase both the costs of manufacture and the space required by the machine, they require more attendance and reduce the reliability of the winding operation.

My invention has for its object to overcome the drawbacks the known thread winders are suffering from. I attain this object by the combination, with a grooved drum the grooves of which can be milled on an ordinary lathe without special tools, of a special thread guiding member which revolves about an axis extending parallel with the grooved drum and has two oppositely directed guiding edges on which the thread while forming an angle on its way from the cop to the drum is guided in such a manner, that is glides alternatively along these edges. The guide member thus is not a thread guide proper in itself and the grooved drum alone is likewise not capable of guiding the thread to and fro in the required manner. By their co-operation, however, these two members are very well suited to produce an irreproachable and also soft cheese even at the highest speeds, the guide member imparting to the thread only a to and fro motion and on the points of reversal a powerful impulse in the opposite direction while the grooved drum determines the pitch angle and secures uniform deposition of the thread on the spool. Because of the fact, that my new thread guide member is of very simple construction and runs only at a comparatively low rate of revolution, its manufacture is very cheap. Besides, no threading is required and, consequently, a group drive may be provided. Furthermore, cross wound cheeses of different length can be produced by one and the same grooved drum by adequately selecting the working speed of the auxiliary thread guide and altering its stroke, the thread thus being caused to reverse on a preceding crossing instead of the last crossing.

In order that my invention may be clearly understood and readily carried into effect, some embodiments of the same are illustrated in the accompanying drawings by way of example.

In these drawings

Figure 1 is a schematic view of a winding appliance with a thread guide designed in accordance with my invention,

Figure 2 shows the appertaining grooved drum in elevation,

Figure 3 is the end view thereof.

Figure 4 shows the development of the drum surface,

Figure 5 is a section on line V—V of Figure 3,

Figures 7, 9, 11 and 12 show embodiments of my new revolving auxiliary thread guide member,

Figures 6 and 8 are the respective sectional end views of Figs. 7 and 9,

Figure 10 is the sectional end view along line 10—10 of Fig. 11,

Figure 13 is a sectional view along line 13—13 of Fig. 12,

Figure 14 is a top view of a winding mechanism with the shaft that carries the thread guide member and is driven by the shaft of the grooved drum, and

Figures 15 and 16 are side elevation and end view thereof.

1 denotes the frame of the winder, Figures 14–16, on which frame are provided the bearings 2 for the throughgoing shaft 3 that carries the grooved drum 4. The frame 1 further carries the bearings 5 for another throughgoing shaft 6 on which are mounted the auxiliary thread guide members 7. The shaft 3 is driven by a pulley 8 and has further mounted on it a gear 9 in mesh with a companion gear 10 mounted on shaft 6. The gear ratio is determined in such a manner, that the number of revolutions of shaft 3 is an integral multiple of that of shaft 6. The direction of revolution of these shafts and gears is marked by arrows in Figure 1.

Each of the grooved drums 4, Figure 2–5, is rigid to shaft 3 and has milled in its cylindrical surface a left-handed and a right-handed groove 11. The pitch of these two grooves is the same throughout, but can vary, so that more or less spires with more or less crossings are obtained. In front of each grooved drum 4 is disposed on shaft 6 the new auxiliary thread guide member 7 which will be described hereinafter in detail. The thread runs on the guide member 7 previous to its arrival over the grooved drum to the spool 14.

The auxiliary thread guide member 7 has for its object to take care that on the end crossings 12 of the grooved drum 4 the thread reverses previous to its reaching the real end of the latter. When the thread 13 has arrived in the end crossing 12A, then the other edge of the thread guide, which in the meantime has executed half a revolution, comes to act and causes the thread 13 to reverse in the crossing 12A. This is effected by the fact, that the thread 13, while gliding on the thread guide 7 owing to the gliding edges of the latter being inclined toward the axis of the shaft 6, has the tendency to move laterally toward that point of the respective edge which is nearest to the shaft 6. This tendency lasts until the thread has arrived at the other end of the drum. Consequently, it runs over the different crossings 12 until it has arrived at the point 12B.

In this point 12B, the other oppositely directed edge of the auxiliary thread guide member 7 enters into action and causes the thread to move in opposite direction, so that it reverses and again travels toward the point 12A. In this manner an absolutely exact guide of the thread is obtained and, consequently an irreproachable cross winding on the spool.

For this reason, as already mentioned, the ratio of the gears 9 and 10 must be such that the auxiliary thread guide member 7 revolves by an integral multiple more slowly than the grooved drum. If, for example, a grooved drum is used as illustrated in Figure 2, which comprises four full spires from point 12B to point 12A and likewise four full spires from 12A to 12B, then the gear ratio of the two shafts 6 and 3 is an eightfold one.

The construction of the auxiliary thread guide member 7 is always the same in principle in the embodiment illustrated, but may of course vary in the details, as represented in Figures 6–13. In the example shown in Figures 6 and 7 the guide edges are formed by strong wires, in Figures 8 and 9 by a pressed body $7^a$, whilst in Figures 10 and 11 the member $7^b$ is a solid flat body.

It is further possible to run the auxiliary thread guide member 7 in the opposite direction. In this case an intermediate gear must be interposed between the gears 9 and 10. The effect of such an arrangement is approximately the same.

It is further possible to alter the stroke of the thread and to cause it to reverse on an earlier crossing of the grooved drum 4. This may be obtained by exchanging the thread guide member 7 for a shorter one and selecting the gear ratio of the shafts 3 and 6 in such a manner that the thread guide member runs more quickly and thus causes reversal of the thread at an earlier instant.

I may also use a thread guide member as shown in Figures 12 and 13, in order to cause the required to and fro motion of the thread 13. This member consists of a solid cylinder $7^c$ into the surface of which are milled two helical flat surfaces *c*. Each of these surfaces *c* extend only on 180 degrees and then goes over into the other helical surface *c* that extends in opposite direction. In this manner gliding edges *a* and *b* are formed at the places where the two surfaces *c* intersect.

The winding spindle 15, Figures 14–16, is mounted in the customary manner on a bifurcated carrier 16 swingingly fixed to a shaft 17 which in turn is mounted in the frame 1. These parts are known in themselves and therefore need not be described in detail. The drawing-off appliance may likewise be of any known construction which may vary according to the kind of the material to be wound and to the shape of the lap.

For sake of simplicity, in the embodiment of Figures 14–16 the grooved rum 4 simultaneously serves to drive the spool 14. The latter may of course be driven also by a separate drum or shaft, so that the drum 4 merely serves for its proper purpose, that means, to guide the thread.

It is of course understood, that the embodiments described above merely show in what manner my invention may be carried into effect, and that various modifications may be made in the structure of my new appliance without departing from the spirit of my invention as defined in the appended claims.

I claim:

1. In a winding machine of the class described a winding spool, a grooved drum and a separate thread guide member disposed in front of the latter and mounted for rotation about an axis parallel to that of said drum, said thread guide member having two opposite edges adapted to guide the thread on its way from the cop to said drum and spool, so as to glide alternatively along one of said edges.

2. In a winding machine of the class described a winding spool, a grooved drum and a separate thread guide member disposed in front of the latter and mounted for rotation about an axis parallel to that of said drum, said thread guide member having two opposite edges adapted to guide the thread on its way from the cop to said drum and spool, so as to glide alternatively along one of said edges, said thread guide member being formed by a body of substantially lozenge shape adapted to revolve about its longer diagonal.

3. In a winding machine of the class described a winding spool, a grooved drum and a separate thread guide member disposed in front of the latter and mounted for rotation about an axis parallel to that of said drum, said thread guide member having two opposite edges adapted to guide the thread on its way from the cop to said drum and spool, so as to glide alternatively along one of said edges, said thread guide member comprising a hub and two wings of substantially triangular shape fixed to said hub along their hypotenuses in opposite direction and diametrically opposite on said hub.

4. In a winding machine of the class described a winding spool, a grooved drum and a separate thread guide member disposed in front of the latter and mounted for rotation about an axis parallel to that of said drum, said thread guide member having two opposite edges adapted to guide the thread on its way from the cop to said drum and spool, so as to glide alternatively along one of said edges, said thread guide member being formed by a roller of oblong cross section, with its axis of rotation extending diagonally.

5. In a winding machine of the class described a winding spool, a grooved drum and a separate thread guide member disposed in front of the latter and mounted for rotation about an axis parallel to that of said drum, said thread guide member having two opposite edges adapted to guide the thread on its way from the cop to said drum and spool, so as to glide alternatively along one of said edges, said thread guide member being formed by a cylinder on the surface of which are milled two diametrically opposite helical flat surfaces.

HANS SCHWEITER.