E. W. COOPER.

MECHANISM FOR TWISTING AND COVERING CORD OR OTHER MATERIALS.

APPLICATION FILED JAN. 22, 1912.

1,100,538.

Patented June 16, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

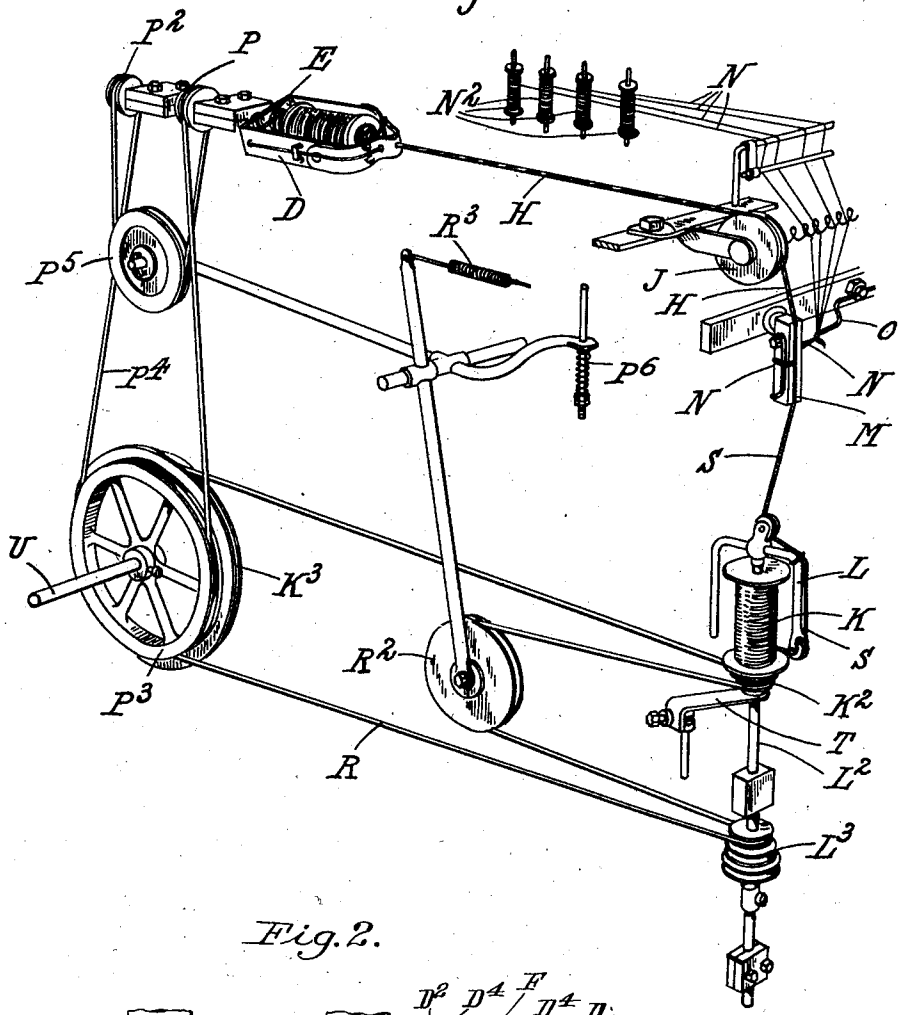
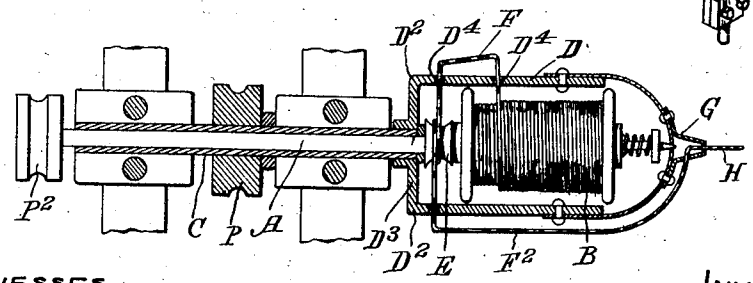


Fig. 2.



WITNESSES

L. Hoskinson

C. S. Brown.

INVENTOR

Edward W. Cooper

per Foster Freeman Watson & Coit

ATTORNEYS

E. W. COOPER.

MECHANISM FOR TWISTING AND COVERING CORD OR OTHER MATERIALS.

APPLICATION FILED JAN. 22, 1912.

1,100,538.

Patented June 16, 1914.

2 SHEETS—SHEET 2.

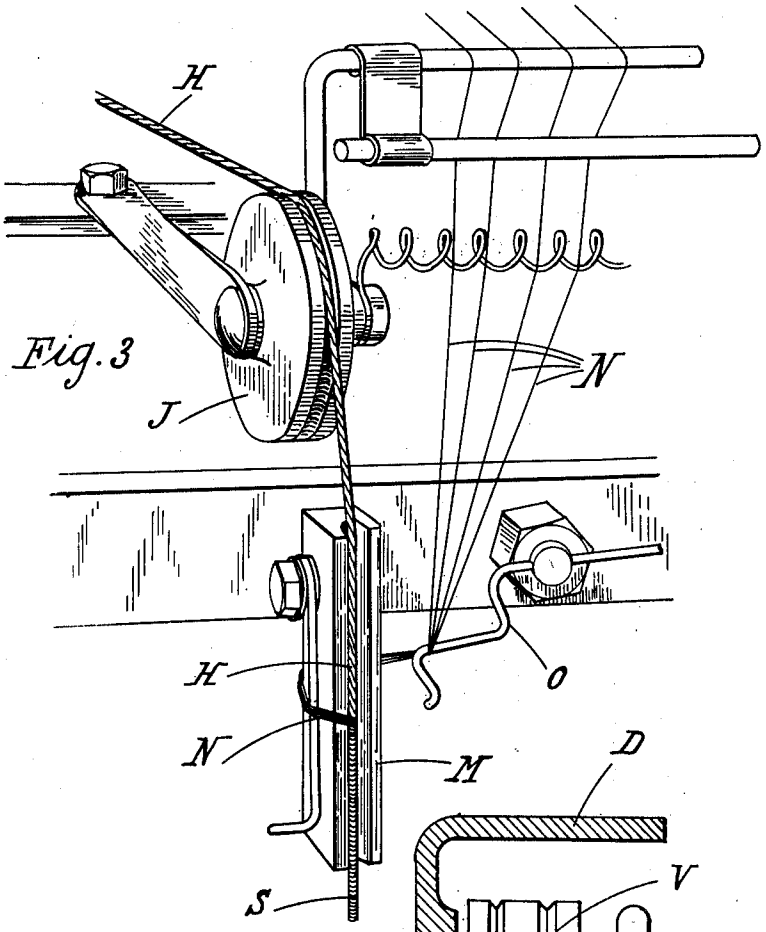


Fig. 3

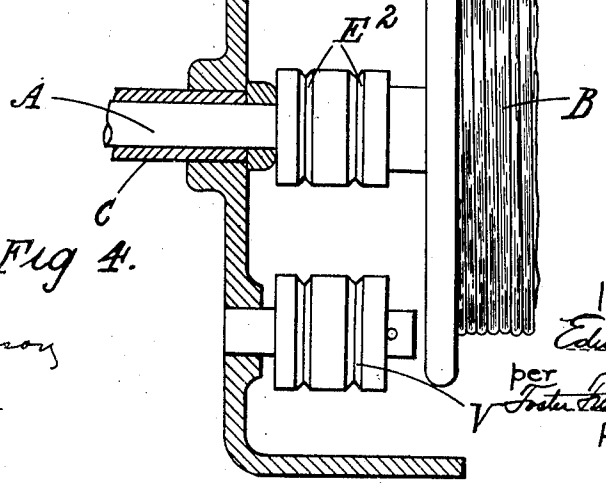


Fig 4.

WITNESSES

L. Hoskinson

C. S. Brown

INVENTOR

Edward W. Cooper

per Foster Freeman Watson & Coit

ATTORNEYS

UNITED STATES PATENT OFFICE.

EDWARD WARD COOPER, OF COVENTRY, ENGLAND.

MECHANISM FOR TWISTING AND COVERING CORD OR OTHER MATERIALS.

1,100,538. Specification of Letters Patent. Patented June 16, 1914.

Application filed January 22, 1912. Serial No. 672,749.

To all whom it may concern:

Be it known that I, EDWARD WARD COOPER, a subject of the King of Great Britain, and a resident of Coventry, in the county of Warwick, England, have invented certain Improvements Relating to Mechanism for Twisting and Covering Cord or other Materials, of which the following is a specification.

The invention relates to improvements in machinery for twisting and covering cord or other material in the manufacture of gimp and the like.

For the most part gimp and similar covered cord is manufactured in lengths and not continuously owing to the difficulty which is experienced with machines for continuous production in providing a constant and uniform rate of feed of the core or gut from one bobbin to another. Hitherto the feeding has been effected by the rotation of the receiving bobbin or its equivalent in such a manner that the material is drawn from the supply or delivery bobbin. Obviously the rate of feed in such cases varies with the amount of material on the receiving bobbin and as it is essential that the rate of feed be uniform such machines could not be satisfactory.

According to this invention, a satisfactory machine for the continuous production of gimp is rendered possible by the employment of a feeding device over which the gut passes on its way from the delivery bobbin. Such feeding device, which may comprise a pulley or set of pulleys is driven at a constant speed.

In machines for twisting and winding strands to form string or the like it has been proposed to pass each strand on its way from its bobbin around a grooved pulley which is loose on the journal at the delivery end of the flier frame, and which is driven by gearing at a different speed from the flier frame to draw the strand off its bobbin. It will be seen hereafter that by this invention the employment of gear wheels and the like is dispensed with.

To obviate the employment of gearing the spindle driving such feeding device may pass through a hollow spindle which carries the delivery flier. These concentric spindles are provided with pulleys of the required dimensions enabling them to be driven at the desired speeds.

An important feature is that the gut passes around a guide pulley just prior to being covered with the covering material. By employing a guide pulley of comparatively large dimensions a comparatively great length of gut is in contact with the periphery, and a stroking action is imparted to the gut, which removes all fluff etc., and has a kind of burnishing effect on the gut resulting in a smoother gimp and better finish than is usually obtained.

The axis of the reels or bobbins lies in the axis of the threads and for this purpose a special form of flier is preferable for the delivery bobbin which is rotated at a slightly higher speed than the receiving one which revolves in the same direction and thus puts the primary twist into the threads. As the receiving bobbin and flier run slightly slower than the delivery flier a small amount of twist is left in the finished material, the amount of twist being varied according to requirements. When it is desired that the material be finished limp or "dead" the twist must be slight. The stiffer the material is required the more twist may be left in the relative speed between the receiving bobbin and its flier adjusted accordingly.

In the manufacture of gimp the cotton or other stranded material which forms the core or gut is twisted slightly and revolved very fast so as to draw on a covering layer which consists of stranded covering material.

In the drawings all unnecessary framework etc., is omitted for the sake of clearness.

Figure 1 is a perspective view showing one side of the machine from above. Fig. 2 is a longitudinal section through the delivery flier and the adjacent parts. Fig. 3 is a perspective view of part of the machine showing the actual covering of the twisted gut with silk strands, and Fig. 4 is a view corresponding to part of Fig. 2, showing a modification.

Like letters indicate like parts throughout the drawings.

In the construction illustrated there is a horizontal spindle A, see Fig. 2, on which is frictionally mounted the delivery bobbin B and this spindle A passes through a hollow spindle C to which is attached the corresponding flier D. The feed pulley E fixed to the spindle A rotates slightly faster than the flier D so that the material wound on

the bobbin B is drawn off and fed through the flier. It is not essential that the bobbin B rotate except in so far as it has to keep up with the flier D. If the bobbin B remains stationary and the flier D revolves around it the flier will have the effect of taking off the thread from the bobbin at a higher speed than the feed pulley E would permit. Where the rate of feed is high the bobbin B can be stationary or nearly so, and the feed pulley E adapted to feed proportionately faster. Further a stationary bobbin or cop may be used as in such case the material wound on the cop is drawn off endwise. Preferably the flier D is of the special shape illustrated, being of stirrup form, the ends D^2 of the stirrup being secured to a cross-piece D^3 attached to the hollow spindle C. The flier D is consequently balanced and symmetrical and it is suitably formed for the passage of the thread or gut F, which may have any desirable number of strands. For instance this passes off the bobbin through holes D^4 and across from one side of the flier to the other, passing around the feeding pulley E, and from there running along the side of the flier as at F^2 and leaving it at the center G of the outer end. The feeding pulley E is on the spindle A on which the bobbin is loosely mounted and as stated it runs slightly faster than the flier D with the result that the material F is drawn off the bobbin, while the flier performs its normal function of twisting the material on its axis as shown at H.

Preferably the twisted material H passes around a guide pulley J and is received on to the receiving bobbin K which is mounted loosely upon the spindle L^2 of its flier L which may be of the ordinary type used in cotton spinning. The flier is driven by any suitable means and the bobbin by means of its own. For instance, it may carry a belt pulley K^2 as may the flier spindle at L^3 both being driven from a common pulley K^3, the two driven pulleys K^2 and L^3 being of slightly different dimensions to give the speeds required. They are also stepped so that the speed of each may be varied slightly.

It will be noticed that the pulley J is of relatively large dimensions. It has been proposed hitherto to pass the cord around small guide pulleys but in such cases the contact between the thread and the pulley was small and such guide pulleys were provided to bring the thread into the correct line. In the present case the contact between the thread and the grooved pulley is long, and it will be understood that the gut H rotates in the groove in the pulley with the result that any loose bits of fluff are removed and the core smoothed down just prior to covering.

The thread H in passing from one bobbin to the other passes over the spreader M, which may be provided with detachable wearing parts, and has applied to it the covering material taking the form of silk strands or other material N. This material may be supplied from spools N^2 the different strands passing from the spools roughly parallel to one another over a finger O and around the spreader M. The ends of the covering material N are first wrapped around the adjacent material H which constitutes the gut, and its revolution draws off the covering material N from the spools, causing it to wrap around the gut in the usual manner, while at the same time the material is fed forward from one bobbin to the other. It will be clear therefore that any suitable number of strands N of covering material may be used and that production is continuous as long as there is any thread on the delivery bobbin.

Obviously the spindles A and C may be driven in any suitable manner. In the construction illustrated each of these is provided with a belt pulley P, P^2 driven from a common driving pulley P^3 mounted upon a driving shaft U. As is necessary the pulley P^2 is slightly smaller than the pulley P as the feed pulley E driven from the pulley P^2 is rotated slightly faster than the flier D. The belt P^4 for driving the pulleys P, P^2 may pass around a jockey pulley P^5 the arm of which is acted on by a spring P^6 to retain it at the desired tension. The belt R which drives the pulleys K^2, L^3 may also pass around a jockey pulley R^2 the lever carrying which is acted on by a spring R^3 to maintain the tension of the belt R.

The receiving bobbin K and its belt pulley K^2 may be moved axially in relation to the flier in order that the silk covered gimp S may be evenly distributed on the bobbin. For this purpose the belt pulley K^2 is engaged by an arm T which may be raised and lowered gradually by means of suitable mechanism of any well known type. For instance, a heart shaped cam, (not illustrated) may act on the arm T, the cam receiving its motion at a suitable reduction from the main driving shaft U which may receive motion from any suitable source.

When the feed from the delivery bobbin is to be relatively high it might be desirable that the material, such as F, Fig. 2, may have a better grip on the feed pulley E. In some cases it might be possible to wrap the material more than once around the feed pulley, but where this is not the case the construction illustrated in Fig. 4 may be used. Here the feed pulley is provided with two grooves E^2 and the feeding material may pass around these grooves and also around loose grooved rollers V. Thus the surface of contact between the material and the pulley E^2 is greatly increased. Where it is desirable to draw out the material

slightly the pulley E^2 may be geared to the rollers V so that a relative speed is set up and the material given a slight draw-out, in the well known manner.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a machine for the purpose described, the combination of a delivery bobbin, a feed pulley arranged to withdraw material from said bobbin and mounted to rotate about the axis of the bobbin, and a flier for guiding said material rotatable about said axis at a different speed from the feed pulley.

2. In a machine for the purpose described, the combination of a delivery flier having a tubular spindle, means for rotating the flier, a delivery bobbin supported within the flier, and independently rotatable about the axis thereof, and means for rotating the bobbin at a higher speed than the flier including a member supported within the tubular spindle of the flier.

3. In a machine for the purpose described, the combination of a bobbin, a spindle therefor, a feed pulley on the spindle rotatable independently of the bobbin and arranged to withdraw material from the bobbin, a second spindle concentrically mounted with respect to said first-mentioned spindle, said spindles being independently rotatable, and a flier mounted on said second spindle and adapted to twist the material withdrawn from the bobbin by said pulley.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD WARD COOPER.

Witnesses:

HAROLD F. E. PAYNE,

ERNEST F. PARKER.