M. PEPLING.

WINDING MACHINE.

APPLICATION FILED APR. 1, 1908.

939,160.

Patented Nov. 2, 1909.

3 SHEETS—SHEET 1.

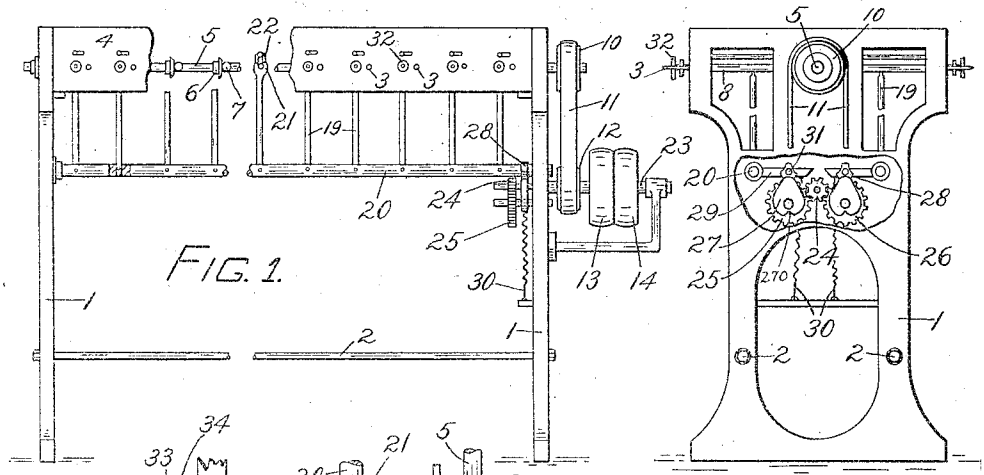

FIG. 1.

FIG. 2.

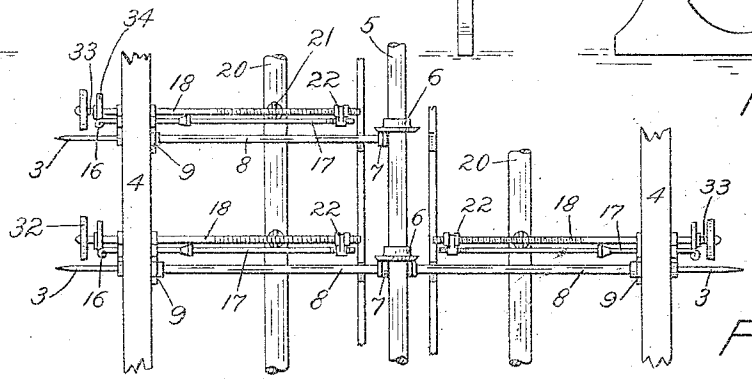

FIG. 3.

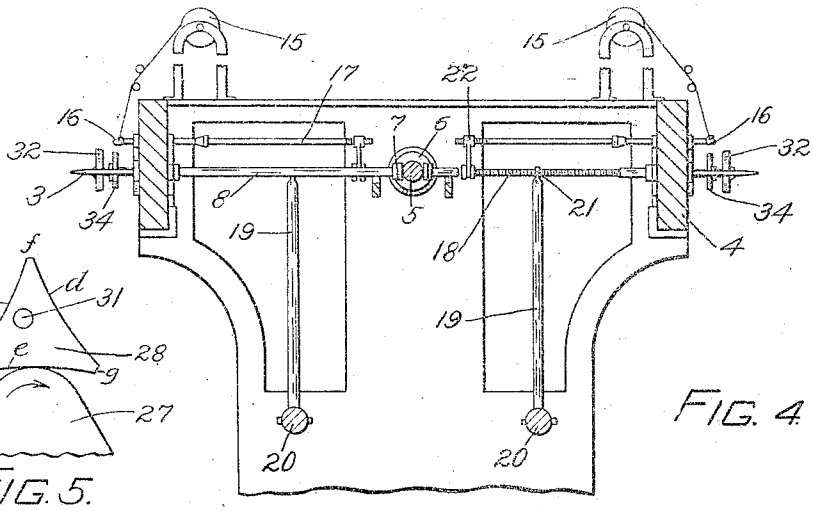

FIG. 4.

FIG. 5.

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3 SHEETS—SHEET 2.

FIG. 8.

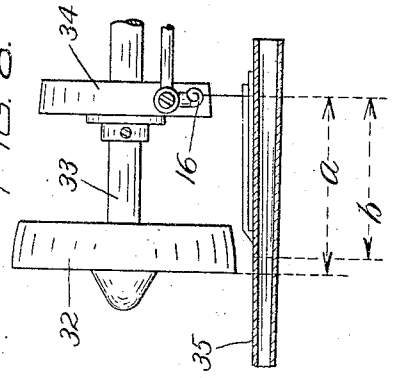


FIG. 7.

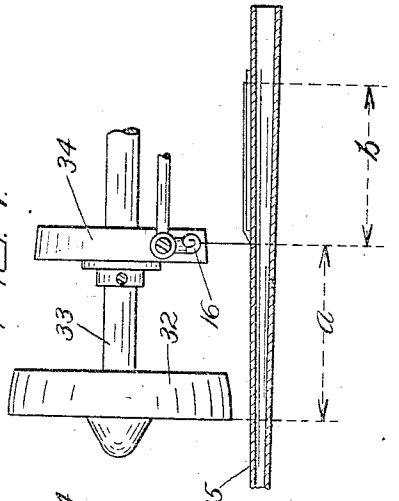


FIG. 6.

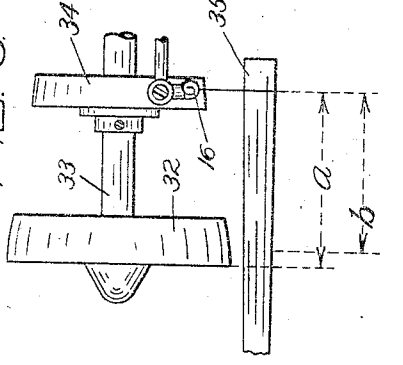


FIG. 11.

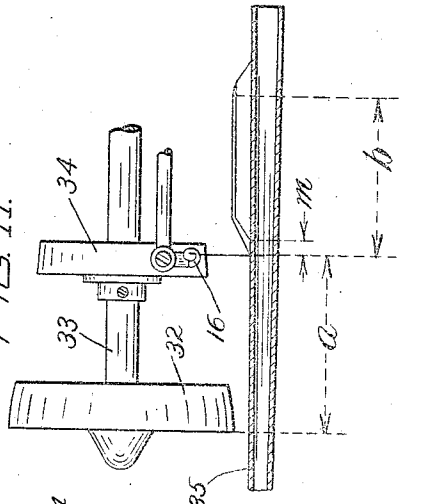


FIG. 10.

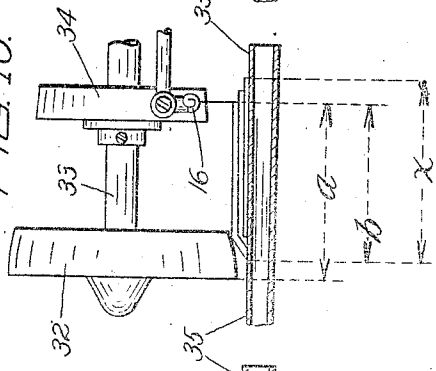
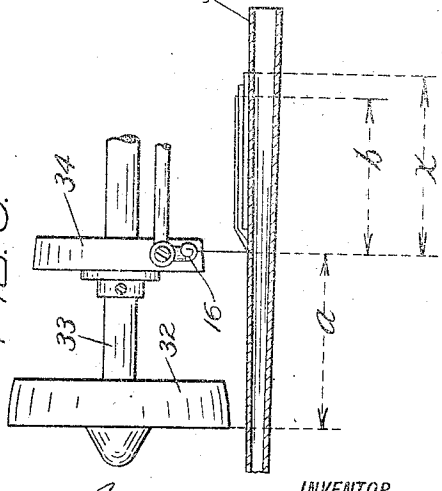


FIG. 9.



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3 SHEETS—SHEET 3.

FIG. 12.

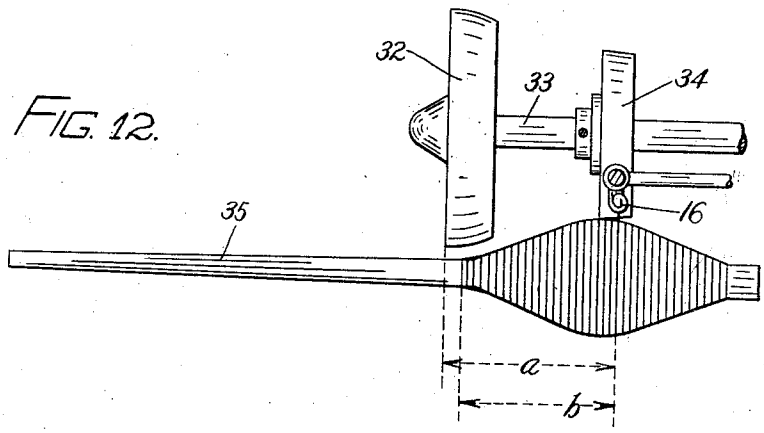


FIG. 13.

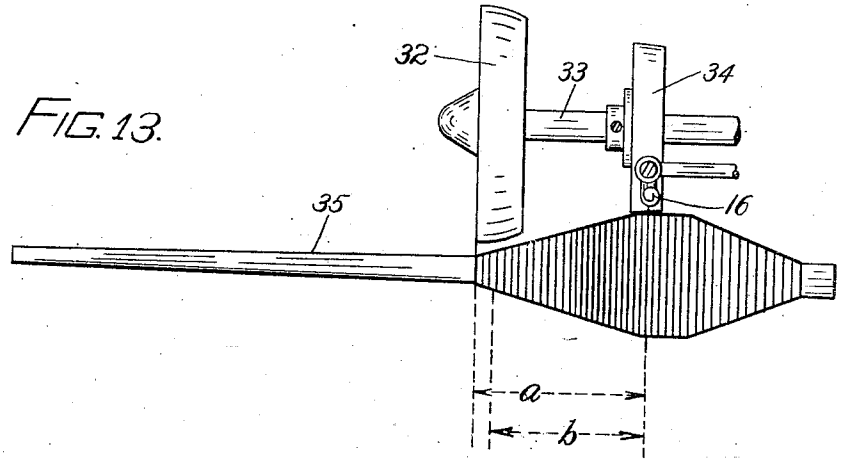
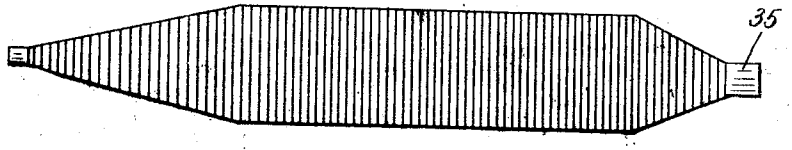


FIG. 14.



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UNITED STATES PATENT OFFICE.

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WINDING-MACHINE.

938,160. Specification of Letters Patent. Patented Nov. 2, 1909.

Application filed April 1, 1908. Serial No. 424,577.

To all whom it may concern:

Be it known that I, MARINUS PEPLING, a citizen of the United States, and a resident of Newark, Essex county, New Jersey, have invented certain new and useful Improvements in Winding-Machines, of which the following is a specification.

My invention relates to winding machines, and particularly to that class of winding machines known as horizontal quilling machines in which a thread guide is reciprocated lengthwise of the spindle of the machine and in which a friction disk is used which, when brought into contact with the thread of the cop, produces a relative advance between the thread guide and the spindle.

One of the objects of my invention is to provide a machine of the character described with suitable mechanism whereby the machine is adapted to wind on paper tubes instead of on wooden quills with conical bases.

Another object of my invention is to provide a machine of the character described with mechanism adapted to build up the heel of the cop while winding the cop on a conical paper tube.

A particular object of my invention is to provide a winding machine of the character described with a second friction disk together with means whereby said disk when brought into frictional contact with the thread of the cop, produces a relative advance between the thread guide and the spindle.

With the above and other objects in view, my invention consists in the parts, improvements and combinations more particularly pointed out in the claims.

Referring now to the drawings which are attached to this specification and form a part thereof, Figure 1 is a front elevation of the machine with a part broken away. Fig. 2 is an end elevation, with part of the frame broken away. Fig. 3 is a plan view of the essential parts of the machine. Fig. 4 is a sectional detailed view. Fig. 5 is a detailed view showing the mechanism for automatically varying the traverse of the thread guide. Figs. 6 to 14 are views, partly diagrammatic, which illustrate the action of building up the cop.

As illustrated in the drawings, the horizontal quilling machine comprises end frames 1, the lower portions of which are connected by rods 2. A plurality of spindles 3 are arranged horizontally and pass through the front cross-piece 4 of the machine. The spindles are adapted to wind cops, and are rotated by any suitable means.

As illustrated in the drawings, I make use of a shaft 5, carrying friction wheels 6, which engage with pulleys 7 mounted on the ends of the shafts 8, carrying the spindles 3. The shafts 8 pass through suitable bearings 9 in the front cross-piece of the machine. The shaft 5 is rotated by means of a pulley 10 secured to one end of the shaft, the pulley being driven by means of a belt 11 and pulley 12, which is in turn driven by the power belt passing over the fast and loose pulleys 13, 14.

Thread to be wound in a cop is supplied from a suitable reel 15. The thread on its way to the spindle passes through a thread guide 16. Suitable means are provided for producing a relative reciprocation between the spindle and the thread guide 16. In the form illustrated in the drawings, the thread guide is reciprocated with relation to the spindle. The thread guide 16 is mounted on a suitable carrier 17, which reciprocates horizontally, and which is connected to screw 18 that engages the means for reciprocating the thread guide. The means for reciprocating the carrier carrying the thread guide may be widely varied.

As illustrated in the drawings, I make use of a rock arm 19, connected to a rock shaft 20, the rock arm being provided with a fork 21, which engages the screw 18 and acts as a nut to permit the advance of the screw with relation to the rock arm 19. In the form illustrated in the drawings the carrier 17 and screw 18 are connected by a coupling 22, so that the screw and carrier move together. By reason of the coupling 22 which is interiorly screw threaded, the thread guide 16 may be adjusted in a direction parallel to the screw 18.

Suitable means are provided for rocking the shaft 20. In the form illustrated upon the drawings, mechanism is provided whereby the shaft 20 may be rocked through a given arc and returned by a spring to varying positions of rest by interposing a mov-

able stop. Such mechanism may be omitted, if desired.

As illustrated in the drawings, the power shaft 23 is provided at one end with a gear 24, which engages with gears 25 and 26, each gear 25, 26 serving to drive its corresponding rock shaft. Connected to the gear 25 is a cam 27, which, acting through the rider 28 and arm 29, rocks the shaft 20. A spring 30 returns the arm 29 and keeps the rider 28 in contact with the cam. The three sides of the rider 28 constitute stops which determine the initial or starting position of the rock shaft 20. The sides *c*, *d*, *e* are arranged at three different distances from the center 31 of the rider, as clearly shown in Fig. 5. When side *c* is in contact with the cam 27, the arm 29 reaches its minimum distance from the shaft carrying the gear 25. With the side *c* in contact with the cam 27, the cam oscillates the arm 29 from this minimum distance to an extent equal to the throw of the cam 27. After one revolution of the cam 27, the notch 270 in the heart at the base of the cam receives the point *h* of rider 28 and turns the rider presenting surface *d* to cam 27. This will permit the arm 29 to oscillate toward the shaft carrying the gear 25 a less distance than before. The cam 27 will now rock the arm 29 between the position determined by the stop *d* and that produced by the throw of the cam 27, and then turn the rider by contact with *f*. On the third revolution of the cam 27, the side *e* comes into contact with the cam and a third starting position for arm 29 is attained. The rider is then turned by the cam striking point *h*. On the fourth revolution of the cam, the side *c* is again interposed between the cam 27 and the arm 29. The friction wheel 32, now comes into contact with the cop producing an advance of the thread guide 16, as will be seen below.

It will be observed by reference to Figs. 7 and 10 that each layer of thread is slightly advanced over the layer next beneath thus forming a nose for the group of threads. By rotating the rider 28, the friction wheel 32 after a predetermined number of revolutions of the cam 27 is urged toward the nose of the group and the desired frictional contact between the disk 32 and the thread is facilitated by the formation of the nose. The same is true of the wheel 34.

By using a roller instead of the rider 28, the arm 29 and rack stop 20 may be returned to the same initial or starting position for each operation of the cam 27.

I provide suitable means for producing a relative advance between the thread guide and the spindle, this being necessary in order to properly build the cop. In the form illustrated in the drawings, I make use of a friction disk 32 for this purpose. The disk 32 is preferably tapered as shown, and is mounted upon a shaft 33, which is connected to the screw 18, and in the form illustrated upon the drawings, forms a prolongation of the screw. By means of a friction disk 32, which by the reciprocation of the screw 18 is brought into frictional contact with the thread of the cop and is given a turn, the screw 18 is turned thus advancing the thread guide 16 with relation to the means for reciprocating the thread guide. The screw 18 is thus given a bodily feeding movement through the fork 21 of the arm 19.

When a paper tube such as the conical tube illustrated in Figs. 6 to 14, is mounted upon the spindle 3, the feeding movement or advance of the thread guide with relation to the spindle which is effected by the rotation of the disk 32, builds the heel of the cop.

In carrying out my invention, I provide means for advancing the thread guide with relation to the spindle, so as to build the body of the cop, which means comes into action after the means for building the heel of the cop has done its work. In the best form of my invention, I make use of a friction disk 34 for this purpose. As illustrated in the drawings, the disk 34 is operatively connected with the screw 18 so as to advance the same when the disk is brought into frictional contact with the thread of the cop. In the best form of the invention, the disk 34 is mounted upon the shaft which constitutes a prolongation of the screw 18. When the disk 34 is brought into contact with the thread of the cop, it turns, thus turning the screw 18, and causing the thread guide 16 to advance with relation to the spindle as well as with relation to the means for reciprocating the thread guide. The friction disk 34 is made of smaller diameter than the disk 32, the distance of the rim of the disk 34 from the spindle 3 determining the diameter of the cop. In the form illustrated upon the drawings, the disk 34 is adjustable toward and from the disk 32, but it may occupy a fixed relation with respect to the disk 32, if desired. The thread guide 16 is arranged opposite the disk 34. In order to insure the best mode of operation, the thread guide should be arranged at a distance from the contacting edge of the disk 32 which is greater than a single traverse of the thread guide but less than the distance between the extreme points of travel of the thread guide as determined by the stops *c*, *e*. I prefer to make the distance of the thread guide from the outer disk 1/8 inch more than a single traverse and 1/8 inch less than the distance *x*.

By referring to the diagrammatic views, Figs. 6 to 14, the operation of the invention will be readily understood. The thread guide 16 is reciprocated through a traverse, indicated by the letter *b*. The distance of the thread guide from the con-

tacting edge of the friction disk 32 is indicated by the letter *a*, and as illustrated, the distance *a* is greater than the distance *b* which indicates a single traverse of the thread guide but less than the distance *x* which indicates the distance between the extreme points of the traverse of the thread guide determined by the stops *c*, *e*. In Fig. 6 no thread has been wound upon the cop tube. In Fig. 7 the first layer has been wound, with the stop *c* in contact with the cam. The thread guide has also made its outward stroke in winding the second layer, with the stop *d* in contact with the driving cam. At the end of the return stroke the stop *e* is thrown into contact with the cam, thus limiting the return of the thread guide, as shown in Fig. 8. The stops *c*, *d*, *e* limit the return of the guide so that it returns to the varying positions from the start as shown in the different views. In Fig. 9, the thread guide has made its outward stroke from the position shown in Fig. 8. It has now reached a distance *x* from its initial position. On the return stroke, the minimum stop *a* is once more thrown into contact with the driving cam so that the thread guide 16 and wheel 32 are urged toward its innermost position by the spring 30. Before reaching this position the friction wheel 32 contacts with the shoulder formed by the overlapping layers of thread in the cop tube as clearly shown in Fig. 10. This action is permitted because the distance *a* is less than the distance *x*, as indicated in Fig. 10, so that the friction disk strikes the edge of the cop when the thread guide reached the position indicated. The friction disk 32 is thus caused to rotate, which turns the shaft 33, and screw 18. The thread guide is thereby advanced through a distance represented by *m* in Fig. 11. The thread guide is now given a similar series of traverses equal to *b*, followed by an advance indicated by the letter *m*. This continues until the cop has been built up, as shown in Fig. 12, that is to say, until it has acquired the proper diameter. When the cop has been built up to the required amount, the inner friction wheel 34, when it approaches its innermost position, contacts with the body of the cop. By this frictional contact, the shaft 33 and screw 18, are given a partial rotation, so that the thread guide 16 is again given an advance. After the friction disk 34 takes upon itself the work of advancing the thread guide 16, it continues to play this role, building the body of the cop until the cop has been completed, as shown in Fig. 14. The friction disk 32 is out of action while the disk 34 operates for the two friction disks are separated to such a degree (the distance between the contacting edges of the disks being greater than the traverse of the thread guide) that when the disk 34 strikes the thread in the cop, the disk 32 is a slight distance away from the nose of the cop.

The friction disk 32 and the friction disk 34 are each narrow and the width of each of them is less than the traverse of the thread guide. This prevents rubbing the thread by a large friction surface and insures the selective, independent and successive actions of the separate disks.

My machine can be used to wind cotton on paper tubes, and is also well adapted for winding silk on such tubes. Owing to the fact that the friction disk only comes into contact with the material to be wound for an instant, there is no disadvantageous rubbing of the fibers of the silk while winding it on the cop tube. It will be observed that a horizontal quilling machine adapted to wind cotton on wooden quills may be rapidly changed into a machine which is also adapted to wind silk or cotton on paper tubes by providing the machine with the friction disk and re-arranged thread guide, as heretofore described.

My invention in its broader aspects is not limited to the particular constructions and relative arrangements of the parts herein shown and described nor to any particular form of apparatus by which the invention may be carried into effect, as many changes may be made in the construction and relative arrangement of the parts as required to adapt the apparatus to the circumstances of the particular application of the invention or to meet the personal views of the engineer employed to carry the invention into effect without departing from the main principles of the invention and without sacrificing its chief advantages.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:

1. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for producing a relative reciprocation between said spindle and said guide, means actuated by the cop for producing a relative advance between said thread guide and said spindle to build the heel of the cop, a friction disk, and means whereby said disk when brought into frictional contact with the thread of the cop, produces a relative advance between the thread guide and said spindle to build the body of the cop, said heel building means being out of contact with the thread of the cop after said friction disk has started building the body.

2. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for producing a relative reciprocation between said spindle and said guide, means actuated by the cop for advancing the thread

guide with relation to said reciprocating means to build the heel of the cop, a friction disk, and means whereby said disk when brought into frictional contact with the thread of the cop, advances the thread guide with relation to said reciprocating means to build the body of the cop, said heel building means being out of contact with the thread of the cop after said friction disk has started building the body.

3. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for producing a relative reciprocation between said spindle and said guide, means actuated by the cop for advancing the thread guide so as to build the heel of the cop, a friction disk, and means whereby said disk when brought into contact with the thread of the cop causes the advance of the thread guide to build the body of the cop, said heel building means being out of contact with the thread of the cop after said friction disk has started building the body.

4. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for producing a relative reciprocation between said spindle and said guide, a pair of disks, and means whereby each of the disks when brought into frictional contact with the thread of the cop produces a relative advance between the thread guide and said spindle to build the heel and body of the cop respectively.

5. In a winding machine, the combination of a spindle, means for rotating said spindle, a thread guide, a carrier for said guide, means for reciprocating said carrier, a shaft, a pair of suitably spaced friction disks mounted on said shaft, said disks being of different diameters, and means whereby each of the disks when brought into frictional contact with the thread of the cop produces a relative advance between the thread guide and said spindle.

6. In a winding machine, the combination of a spindle, means for rotating said spindle, a thread guide, a carrier for said guide, means for reciprocating said carrier, a shaft, a pair of suitably spaced friction disks mounted on said shaft, the inner friction disk being of smaller diameter than the outer disk, said thread guide being arranged opposite the inner friction disk, and means whereby each of the disks when brought into frictional contact with the thread of the cop produces a relative advance between the thread guide and said spindle.

7. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for producing a relative reciprocation between said spindle and said guide, a pair of disks, and means whereby each of the disks when brought into frictional contact with the thread of the cop advances the thread guide with relation to said reciprocating means to build the heel and body of the cop respectively.

8. In a winding machine, the combination of a spindle, means for rotating said spindle, a thread guide, a carrier for said guide, means for reciprocating said carrier, a shaft, a pair of suitably spaced friction disks mounted on said shaft, said disks being of different diameters, and means whereby each of the disks when brought into frictional contact with the thread of the cop advances the thread guide with relation to said reciprocating means.

9. In a winding machine, the combination of a spindle, means for rotating said spindle, a thread guide, a carrier for said guide, means for reciprocating said carrier, a shaft, a pair of suitably spaced friction disks mounted on said shaft, the inner friction disk being of smaller diameter than the outer disk, said thread guide being arranged opposite the inner friction disk, and means whereby each of the disks when brought into frictional contact with the thread of the cop advances the thread guide with relation to said reciprocating means.

10. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for reciprocating said guide, a shaft, a pair of disks on said shaft, the inner disk being of smaller diameter than the outer disk, means whereby the outer disk causes the advance of the thread guide so as to build the heel of the cop, and means whereby the inner disk causes the advance of the thread guide to build the body of the cop.

11. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for reciprocating said guide, a shaft, a pair of disks on said shaft, the inner disk being of a smaller diameter than the outer disk, said thread guide being arranged opposite said inner friction disk, means whereby the outer disk causes the advance of the thread guide so as to build the heel of the cop, and means whereby the inner disk causes the advance of the thread guide to build the body of the cop.

12. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for reciprocating said guide, a friction disk adapted to be brought into frictional contact with the thread of the cop, means whereby said disk causes the advance of said thread guide, and another friction disk likewise adapted to be brought

into frictional contact with the thread of the cop, and operatively connected with said means.

13. In a winding machine, the combination of a spindle adapted to wind a cop, means rotating said spindle, a thread guide, a carrier for said guide, a screw connected to said carrier, means for reciprocating said screw, means actuated by the cop for producing a relative advance between said thread guide and said spindle to build the heel of the cop, a friction disk, and means whereby said friction disk when brought into contact with the thread of the cop produces a relative advance between the thread guide and said spindle to build the body of the cop, said heel building means being out of contact with the thread of the cop after said friction disk has started building the body.

14. In a winding machine, the combination of a spindle, means for rotating said spindle, a thread guide, a carrier for said guide, a screw connected to carrier, means for reciprocating said screw, a shaft, a pair of suitably spaced friction disks mounted on said shaft, said disks being of different diameters, and means whereby each of the disks when brought into frictional contact with the thread of the cop acts to turn said screw, thus producing a relative advance between the thread guide and said spindle.

15. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, a carrier for said guide, a screw connected to said carrier, means for reciprocating said screw, a pair of disks mounted on said screw, said disks being adapted when brought into frictional contact with the thread of the cop to turn said screw thereby advancing the thread guide with relation to said reciprocating means.

16. In a winding machine, the combination of a spindle adapted to wind a cop, means for rotating said spindle, a thread guide, a carrier for said guide, a screw connected to said carrier, means for reciprocating said screw, a pair of disks mounted on said screw, the inner disk being of smaller diameter than the outer disk, said thread guide being arranged opposite the inner disk, and said disks being adapted when brought into frictional contact with the thread of the cop to turn said screw thereby advancing the thread guide with relation to said reciprocating means.

17. In a horizontal quilling machine, the combination of a horizontal spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for producing a relative reciprocation between said spindle and said guide, a horizontal shaft, a pair of friction disks mounted on said shaft, and means whereby each of the disks when brought into frictional contact with the thread of the cop produces a relative advance between the thread guide and said spindle.

18. In a horizontal quilling machine, the combination of a horizontal spindle, means for rotating said spindle, a thread guide, a horizontal reciprocating carrier for said guide, means for reciprocating said carrier, a horizontal shaft, a pair of suitably spaced friction disks mounted on said shaft, the inner friction disk being of smaller diameter than the outer disk, said thread guide being arranged opposite the inner friction disk, the distance between said thread guide and the contacting edge of said outer friction disk not exceeding the maximum traverse of the thread guide, and means whereby each of the disks when brought into frictional contact with the thread of the cop produces a relative advance between the thread guide and the said spindle.

19. In a horizontal quilling machine, the combination of a horizontal spindle, means for rotating said spindle, a thread guide, a horizontally arranged carrier for said guide, means for reciprocating said carrier, a shaft, a pair of suitably spaced friction disks mounted on said shaft, the inner friction disk being of smaller diameter than the outer disk, said thread guide being arranged opposite the inner friction disk, the distance of said thread guide from the contacting edge of said outer friction disk being less than the maximum traverse of the thread guide, and means whereby each of the disks when brought into frictional contact with the thread of the cop, advances the thread guide with relation to said reciprocating means.

20. In a horizontal quilling machine, the combination of a horizontal spindle adapted to wind a cop, means for rotating said spindle, a thread guide, a screw, means for reciprocating said screw, a horizontal shaft, a pair of disks on said shaft, the inner disk being of smaller diameter than the outer disk, means whereby the outer disk when brought into contact with the thread of the cop causes the advance of the thread guide so as to build the heel of the cop and means whereby the inner disk causes the advance of the thread guide to build the body of the cop.

21. In a horizontal quilling machine, the combination of a horizontal spindle adapted to wind a cop, means for rotating said spindle, a thread guide, a screw, means for reciprocating said screw, a horizontal shaft, a pair of disks on said shaft, the inner disk being of smaller diameter than the outer disk, said thread guide being arranged opposite said inner disk, means whereby the outer disk when brought into contact with the thread of the cop causes the advance of the thread guide so as to build the heel of the cop and means whereby the inner disk

causes the advance of the thread guide to build the body of the cop.

22. In a horizontal quilling machine, the combination of a horizontal spindle adapted to wind a cop, means for rotating said spindle, a thread guide, means for producing a relative reciprocation between said spindle and said guide, a friction disk, means whereby said disk when brought into frictional contact with the thread of the cop produces a relative advance between the thread guide and the spindle to build the heel of the cop, and means actuated by the cop for producing an independent advance between said thread guide and said spindle to build the body of the cop, said friction disk being out of contact with the thread of the cop after said means for building the body has started building.

23. In a winding machine, the combination of a spindle adapted to wind a cop, means including a power shaft for rotating said spindle, a thread guide, means for producing a relative reciprocation between said spindle and said guide, means actuated by said power shaft and connected with said thread guide, to produce a relative advance between said thread guide and said spindle to build the heel of the cop, a friction disk and means whereby said disk when brought into frictional contact with the thread of the cop produces a relative advance between the thread guide and said spindle to build the body of the cop, said heel building means being out of contact with the thread of the cop after said friction disk has started building the body.

24. In a winding machine, the combination of a spindle adapted to wind a cop, means including a power shaft for rotating said spindle, a thread guide, means for producing a relative reciprocation between said spindle and said guide, means actuated by said power shaft and connected with said thread guide, to advance the thread guide so as to build the heel of the cop, a frictional disk, and means whereby said disk when brought into contact with the thread of the cop causes the advance of the thread guide to build the body of the cop said heel building means being out of contact with the thread of the cop after said friction disk has started building the body.

25. In a winding machine the combination of a spindle adapted to wind a cop, means including a power shaft for rotating said spindle, a thread guide, a carrier for said guide, a screw connected to said carrier, means for reciprocating said screw, means actuated by said power shaft and connected with said thread guide to produce a relative advance between said thread guide and spindle to build the heel of the cop, a friction disk and means whereby said friction disk produces a relative advance between the thread guide and said spindle said heel building means being out of contact with the thread of the cop after said friction disk has started building the body.

26. In a winding machine for winding cops, the combination of a spindle, a thread guide, with means for building the heel of the cop comprising a friction disk adapted to contact with the thread of the cop the width of said disk being materially less than the traverse of the thread guide and means actuated by the cop, acting through said disk, to produce a relative advance between thread guide and spindle so as to build the heel of the cop.

27. In a winding machine for winding cops, the combination of a spindle, a thread guide, with means for building the heel of the cop, comprising a member adapted to contact with the thread of the cop the width of said member being materially less than the traverse of the thread guide and means actuated by the cop, acting through said member, to produce a relative advance between thread guide and spindle so as to build the heel of the cop.

28. In a winding machine for winding cops, the combination of a spindle and thread guide, with means for building the heel of the cop comprising a member connected with said thread guide and adapted to contact with the thread of the cop, the width of said member being materially less than the traverse of the thread guide together with means actuated by the cop, acting through said member to produce an advance of said thread guide so as to build the heel of the cop.

29. In a winding machine for winding cops on paper tubes, the combination of a spindle, a thread guide, with means for building the heel of the cop, comprising a narrow friction disk adapted to contact with the thread of the cop, the width of the disk being materially less than the traverse of the thread guide, a screw on which the disk is mounted, said disk when actuated by the thread of the cop giving an advance to the thread guide, determined by the pitch of said screw so as to build the heel.

30. In a winding machine for winding cops on paper tubes, the combination of a spindle, a thread guide, a pair of friction disks adapted successively to contact with the thread of the cop to build the heel and body thereof, the distance between the contacting edges of said disk being greater than the traverse of the thread guide.

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

MARINUS PEPLING.

Witnesses:
WM. F. BISSING,
H. M. SEAMANS.