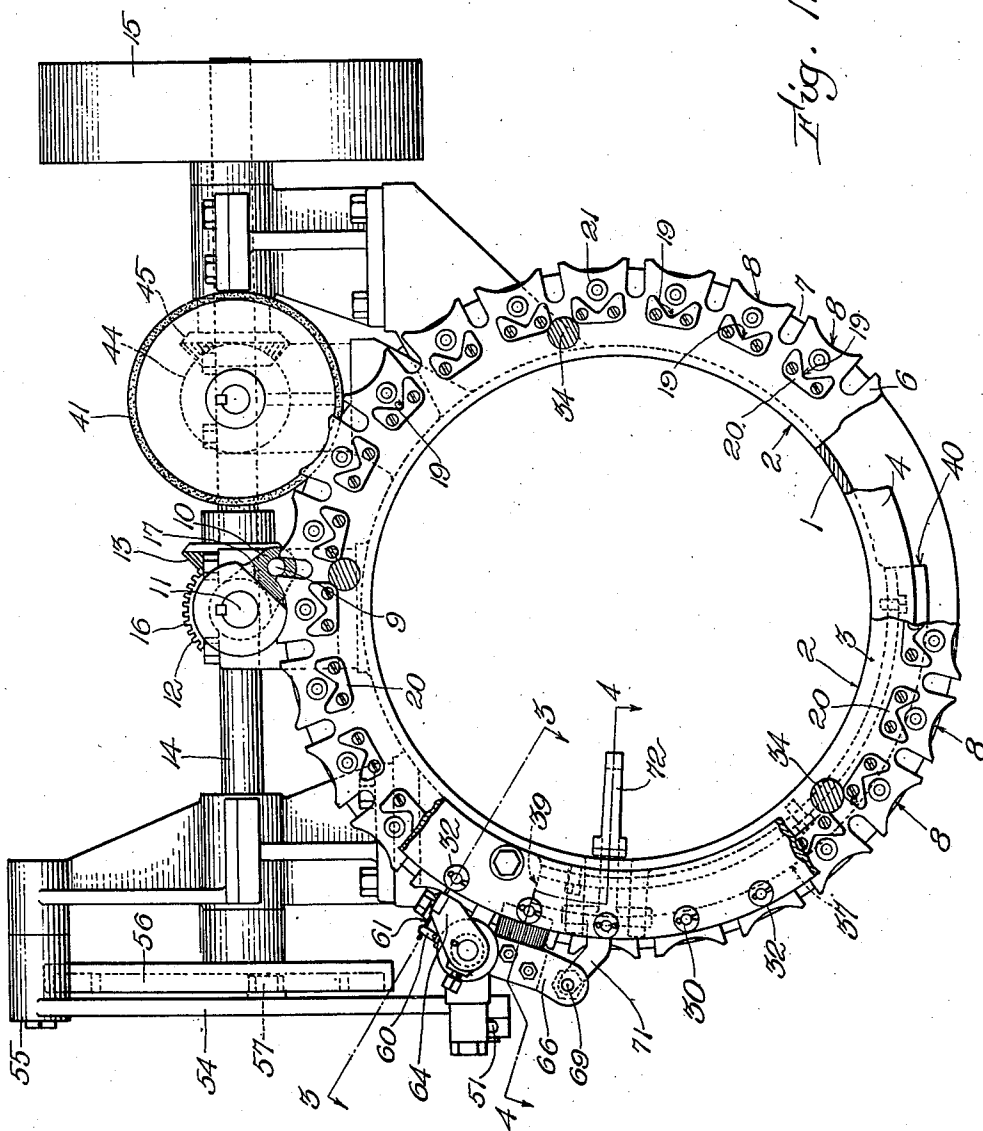


1,109,949.

4 SHEETS—SHEET 1.



Edward Maxwell

by Geo. H. Maxwell
Attorney.

T. P. WALSH.
MACHINE FOR CUTTING AND STRIPPING YARN FROM BOBBINS.
APPLICATION FILED DEC. 17, 1909.

1,109,949.

Patented Sept. 8, 1914.

4 SHEETS—SHEET 2.

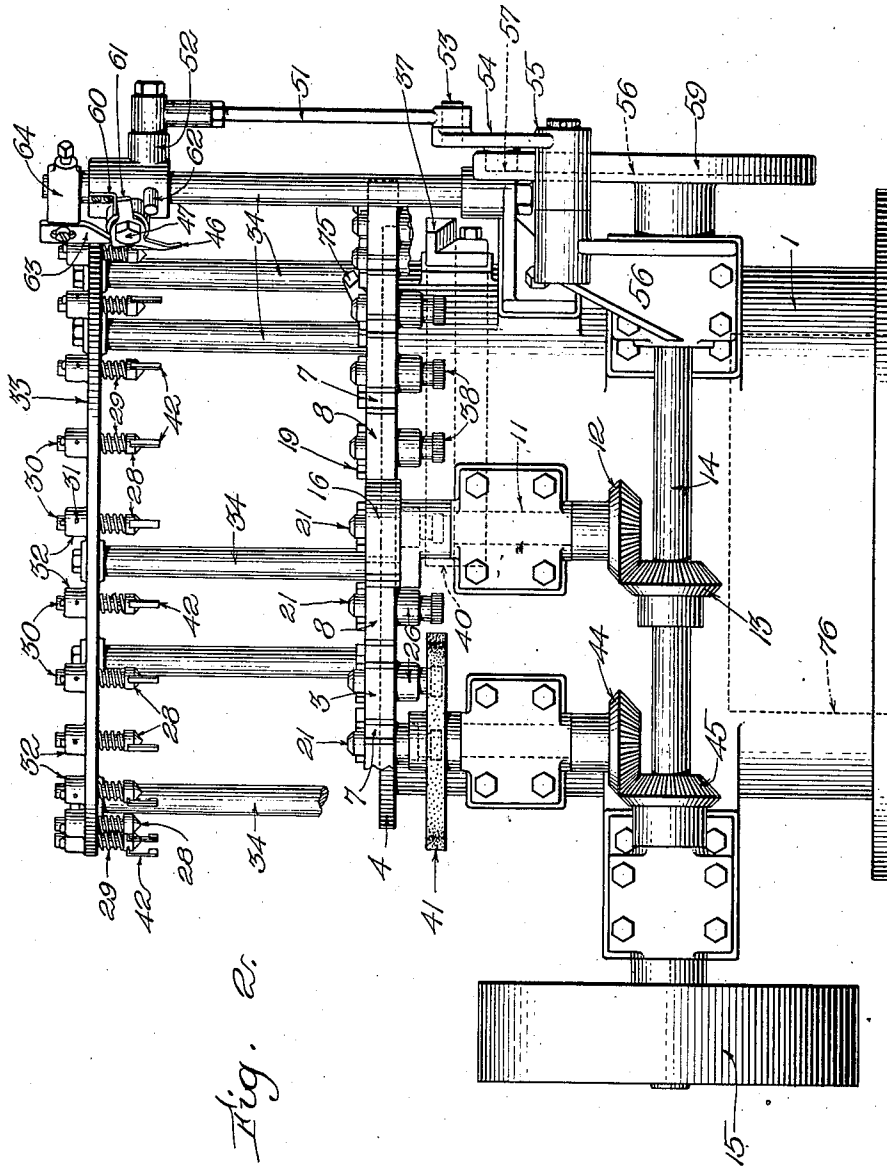


Fig. 2.

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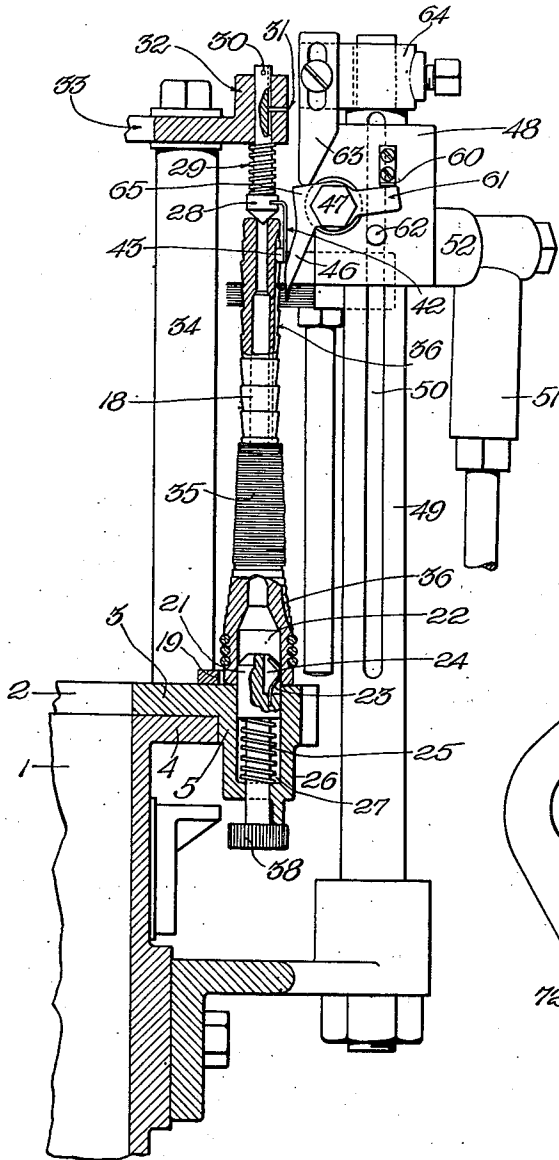
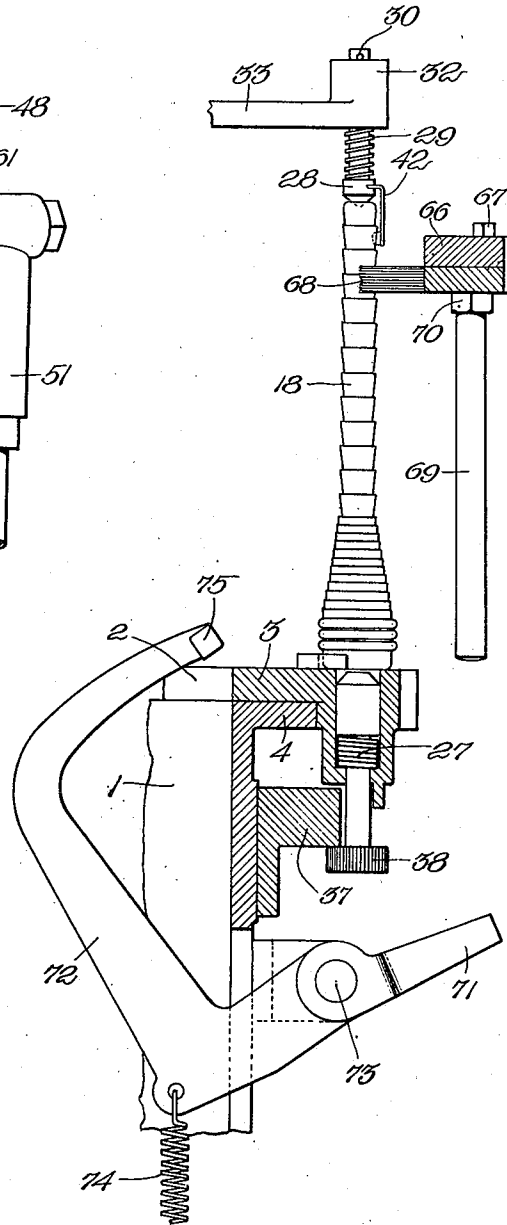
1,109,949.

Patented Sept. 8, 1914.

4 SHEETS—SHEET 3.

Fig. 3.

Fig. 4.



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4 SHEETS-SHEET 4.

Fig. 5.

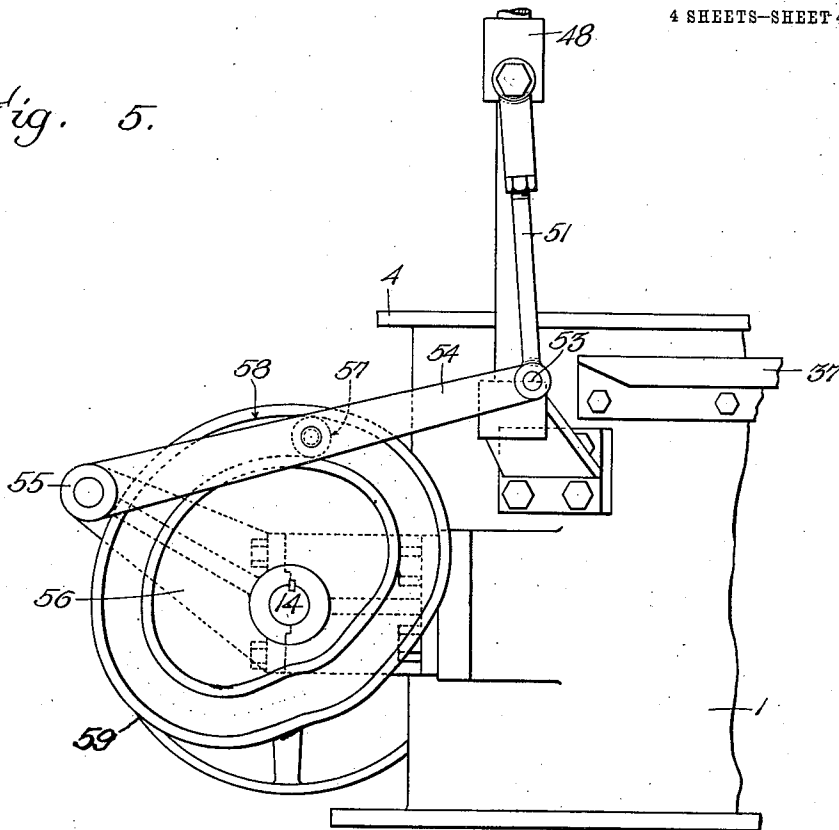
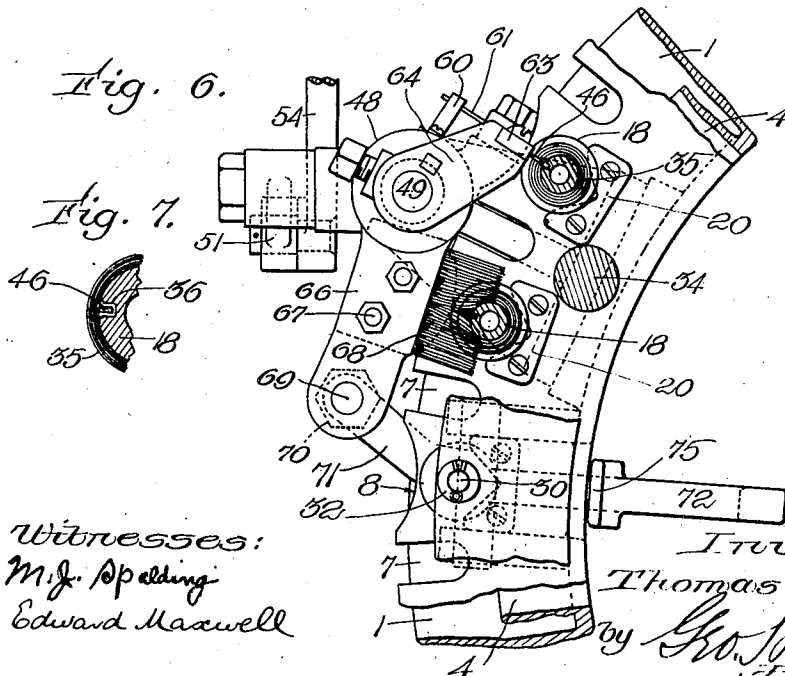


Fig. 6.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR CUTTING AND STRIPPING YARN FROM BOBBINS.

1,109,949.

Specification of Letters Patent.

Patented Sept. 8, 1914.

Application filed December 17, 1909. Serial No. 533,667.

To all whom it may concern:

Be it known that I, THOMAS P. WALSH, a citizen of the United States, and resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a Machine for Cutting and Stripping Yarn from Bobbins, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My present invention is an apparatus for removing the remnants of yarn which are commonly left on bobbins when removed from the loom, spinning frame, spooling frame, quilling machines, speeders, or wherever else bobbins may be employed. There is commonly left on the bobbins (which term I use broadly to include all forms of devices for holding yarn in a machine to be delivered therefrom for spinning, quilling, weaving, spooling, or any other purpose) a few layers of yarn which have to be removed before the bobbins can be used again, said layers being due to the fact that the yarn breaks when the bobbin becomes nearly but not quite empty or to the fact that the bobbin is stopped by the feeler mechanism or thrown out, in the case of an automatic loom. This remnant of yarn which is always left on a bobbin has heretofore been removed by hand by cutting it off, or by reeling it off, or has been stripped off by crowding and sliding it endwise along the spindle of the bobbin. Reeling off the yarn is necessarily slow and hence is very seldom resorted to, and stripping the yarn off by machine is also slow and scrapes and roughens the bobbin, and frequently splits the bobbin, so that the usual procedure is to turn the bobbins over to boys who cut off the yarn by slashing with a knife lengthwise of the bobbin. This produces in the surface of the bobbin a series of lengthwise cuts. It is necessary that a bobbin shall retain a perfectly smooth surface for proper use, and accordingly it is the object of my invention to provide a machine for quickly cutting these remnants of yarn from bobbins and stripping the cut yarn therefrom without any possible injury to the yarn-receiving surface of the bobbin. To this end, I provide means for receiving and supporting a bobbin in a predetermined position while a cutting tool is brought into such relation to the yarn remnant on the

bobbin as to cut the yarn from the bobbin without injury to the bobbin surface. Preferably also the machine includes a stripping device, herein shown as a brush, for positively removing the cut yarn.

The constructional details of my machine, in its preferred embodiment as shown in the drawings, and the operation thereof and further advantages resulting therefrom will be pointed out more fully in the course of the following description and further defined in the appended claims:

In the drawings, Figure 1 is a plan view of the machine, parts being broken away to show the lower portions in detail; Fig. 2 shows the machine in rear elevation, parts being broken away for clearness of illustration; Fig. 3 is an enlarged vertical sectional view taken on the line 3—3, Fig. 1; Fig. 4 is a similar sectional view taken on the line 4—4, Fig. 1; Fig. 5 is a fragmentary detail in enlarged end elevation of the operating mechanism, viewing Fig. 1 from the left and Fig. 2 from the right; Fig. 6 is a top plan view of the part shown in Figs. 3 and 4, assembled, portions being broken away for clearness of illustration; and Fig. 7 is an enlarged sectional detail showing the operative relation of the cutting knife to the bobbin when cutting off the yarn.

For convenience of illustration I have herein shown the machine adapted to handle loom bobbins and warp bobbins, but it will be understood that the machine may readily be adapted by slight changes to all other kinds of bobbins. In the machine of the drawings, on a cylindrical standard 1 is mounted a ring 2 whose flat inner portion 3 is mounted to slide on a shelf-like bearing or track 4, best shown in Figs. 3 and 4, of the supporting standard 1, being accurately guided or centered thereon by a depending flange 5 of said ring. This ring is provided with an outwardly projecting portion 6 having a series of slots 7 and intermediate dwells 8. The slots 7 cooperate with a pin 9 which projects upwardly from an arm 10 which extends from a shaft 11 rotated by beveled gears 12, 13 and drive shaft 14 which is driven by a belt pulley 15. The shaft 11 is also provided with a hub 16 to cooperate with the dwells 8 having a flattened side 17 to permit the rotation of the ring 2, all of said mechanism being of the well known

Geneva movement kind, in which the portions 6, 7, and 8 constitute a star wheel and the portions 9, 10 and 16 constitute a pin wheel to coöperate therewith, being preferably made in one piece. By this mechanism the ring 2 is given a positive step-by-step movement, accurately timed with relation to the cutting and stripping mechanism to be described. At suitable intervals, corresponding to the step-by-step movement, the ring 2 is provided on its top side with means for receiving and accurately positioning one end of a bobbin, such for example as the bobbin 18 shown in Figs. 3 and 4, said means as herein shown comprising an angular seat 19 against which the sides of the bobbin head may rest, said seat having its vertical walls formed in a boss or foot 20 secured on or formed as a part of the upper side of the ring 2. In front of each seat 19 I mount any suitable holding means for the bobbin, herein shown as a conical-ended stud or pin 21 adapted to enter the recs or open end 22 of the bobbin, said stud or pin 21 being preferably provided with any suitable means for preventing or retarding the bobbin from tendency to rotate on said stud, said means being herein shown as an angularly bent spring 23 occupying a vertical slit 24 in the stud or pin 21. The latter is mounted in a vertical hole or cavity 25 provided therefor in a depending portion 26 of the carrying ring 2 and is held upward by a spring 27, normally in the position shown in Fig. 3. The opposite or upper end of each bobbin 18 is held in position by a somewhat similar conical-ended stud or pin 28 held yieldingly downward by a spring 29, being limited in its downward movement by a transverse pin 30 and held against rotation by a pin 31, said pins 28 being mounted in the outer portion 32 of a top ring or carrier 33 supported rigidly on posts 34 extending up from the bottom ring or carrier 2, said two rings and their connecting posts constituting the supporting carrier for the bobbins which are to be cleared of the yarn remnants. On the bobbin shown in Fig. 3, the yarn remnant referred to is indicated at 35. These bobbins are preferably provided with a longitudinal groove 36, as fully explained and duly claimed in my co-pending application Serial No. 529,055, filed November 20, 1909. The operator stands in front of the machine as it is shown in Fig. 1, and places the bobbins in position, at each time the lower studs or pins 21 are pulled down as shown in Fig. 4, by means of a stationary cam 37 whose under side engages the heads 38 of said studs. The cam 37 starts at the point 39, Fig. 1, and ends at the point 40, and the operator places the bobbins in position at any point in the travel of the bobbin carrier and holding studs along the latter portion of this cam. As

soon as the heads 38 of the studs 21 escape from the end 40 of this cam, the studs are forced upward by their springs 27 into positive holding engagement with the bobbins. The stud-heads 38 are preferably milled or knurled on their peripheries, and as the bobbins proceed in their step-by-step movement, these knurled heads 38 are brought in contact with a constantly rotating friction wheel 41, whose periphery is provided with a friction surface of leather or any other suitable substance, for rotating the studs 21 and thereby yieldingly turning the spindles 18 until their longitudinal slots 36 arrive opposite a spring 42 which is permanently secured at its upper end in the top stud or pin 28, and provided at its lower end with an ear or inwardly projecting detent 43 which immediately snaps into the groove 36 and thereby locks the bobbin in position. In case the lower stud or pin 21 is rotated farther, it simply slides around inside of the bobbin without turning it, the friction spring 23 then yielding. The spring 23 is intended to bring only enough friction to insure the rotation of the bobbin when perfectly free to rotate, but is insufficient to rotate or tend to rotate said bobbin when locked by the spring lock 42. The friction wheel 41 which brings the successive bobbins into proper position to be locked is operated by any suitable means, as by beveled gears 44, 45 and the shaft 14. Having been locked in correct position, so that the slot 36 of the bobbin stands preferably radially outward with relation to the carrier, it continues its travel until it arrives at the position indicated by the section line 3-3 and shown in Fig. 3, in which position the carrier and bobbin are preferably halted for the cutting operation. I prefer to have the bobbins travel or move step by step and maintain the cutting means relatively stationary so that the cutter simply moves up and down while all the transverse traveling movement is accomplished by the bobbins.

Any kind of cutting mechanism may be employed within my invention, in its preferred aspects a vertically reciprocating knife being preferred. I provide a knife 46 pivotally mounted at 47 on a head 48 slidingly mounted on a vertical rod or guideway 49 provided with a key 50 to prevent said head from turning thereon. The reciprocation of the knife is accomplished by a link 51 pivoted at one end on a stud 52 which projects laterally from the head 48 and at its other end pivoted at 53 to the free end of a lever 54 which is pivoted at 55 on a fixed bracket 56 and carries a cam stud 57 which travels in a path 58 of a cam 59 fast on the end of the main shaft 14. The knife 46 runs down to a thin point, as clearly shown in Fig. 3, and the outer or front edge thereof is a sharp edge, while the back, which slides in

the slot or groove 36 of the bobbin 18, is dull, as best shown in Fig. 7, so that the knife cuts outwardly and readily cuts through the bunch of yarn 35 on the downward movement of the knife, without any possibility of slashing or injuring in any manner the bobbin. A spring 60 in engagement with a tail piece 61 of said knife normally holds the knife under tendency to move forward into position to travel in the groove 36 of the bobbin. A stud 62 projecting from the head 48 in the path of said tail piece 61 limits the pivotal movement of the knife so that it cannot cause injury to any part of the machine in its downward movement in case it should be operated in the absence of a bobbin. An adjustable stop 63 carried by a collar 64 fastened on the upper end of the guide post 49 is in position to engage the heel 65 of the knife and swing it outwardly away from bobbin-engaging position when the knife is at the upward limit of its travel as shown in Fig. 3, thereby holding the knife out of the line of travel of the bobbins in their step-by-step movement, so as not to interfere with the bobbins as they are being brought into cutting position and are thereafter being moved from said cutting position. The head 48 is provided at one side with an integral arm or bracket 66 to which is bolted at 67 a stripping brush 68 in front of the next dwell or stopping position of the bobbin-carrier, and at the outer end of said arm or bracket 66 a tappet or depending rod 69 is tapped or otherwise secured, being held in adjustment by a check nut 70. This tappet or depending rod 69 comes in front of the next dwell or halting position of the bobbin-carrier. In the path of said tappet or rod 69 is the rear end 71 of an ejector lever 72 pivoted to the standard 1 at 73 and normally held down by a spring 74. Said ejector has a T-shaped striker end, preferably covered with leather or otherwise padded as indicated at 75. Thus when the head 49 is lowered, the knife 46 cuts through the yarn 35 of one bobbin while the brush 68 simultaneously strips the cut yarn from the next preceding bobbin, and the tappet 69 operates the ejector 72 to dislodge and eject the second preceding bobbin. This operation is repeated at each step in the forward movement of the bobbin-carrier. Preferably the standard 1 is tubular so as to receive the yarn which is stripped from the successive bobbins by the stripping brush or whatever stripping mechanism may be provided, said yarn being received in a basket or other receptacle placed inside the standard or pedestal 1 and removed through an opening 76 provided at its base.

In operation, the attendant slips the bobbins successively in place with extreme rapidity. He presents the bobbin obliquely to the machine, striking its upper end against the pin 28 sufficiently to raise said pin

slightly while he slides the bottom end of the bobbin in on the plate 3 against the centering recess 19. An operator quickly gets skilled so that he can present a bobbin with each hand alternately, taking the bobbins from the basket in which they are gathered from the looms. As the bobbins are put in position, the Geneva movement moves the carrier forward step by step, and as the freshly inserted bobbins reach the end 40 of the stationary cam 37, the springs 27 instantly move the lower holding pins 21 upwardly as their heads 38 are released from said cam 37, thereby accurately centering the bobbins in case they have not been centered quite accurately before, and at the same time holding them in correct position with a frictional engagement because of the spring 23 sufficient to cause the rotation of the bobbins when later the head 38 of said pins is engaged by the slowly rotating friction wheel 41. As the bobbin-carrier moves the bobbins forward step by step, they are rotated for the moment that the carrier halts in front of the friction wheel 41, thereby being turned until the knife slot 36 of each bobbin is brought into absolutely correct position for the succeeding cutting operation and locked automatically by the locking spring 42. This correct positioning of the bobbins having been accomplished, they proceed in their step-by-step travel until they come in front of the knife 46. As each bobbin halts in front of the knife, the latter is moved by its spring 60 into the knife slot 36 of the bobbin and quickly slid downward therein so as to shear through the small mass or remnant 35 of yarn. This having been accomplished, the knife moves upwardly again, its heel 65 striking against the stationary stop 63, which turns the knife out of the slot and out of the way of the travel of the bobbins. The bobbin whose yarn has thus been cut through is now carried along one farther step, and its cut yarn is stripped or cleaned from the bobbin by the brush 68, which pokes or brushes the yarn off backward into the receptacle provided for it. As the bobbin leaves the brush or other stripping and cleaning mechanism, the lower holding stud or pin 21 engages the cam 37 and is thereby moved downwardly to the position shown in Fig. 4 out of holding engagement with the bobbin. At the next halt in the forward movement of the bobbin, which has now been cleaned and also released, the tappet or rod 69 strikes the end 71 of the ejector 72, thereby causing the latter to strike against the lower end of the bobbin and eject it quickly and yet delicately from the machine without chance of injury thereto. This ejecting of the bobbins all takes place at one and the same point in the progress of the machine, so that it becomes feasible to catch all the

bobbins in a basket placed therefor at this point. This eliminates the handling or gathering up of the bobbins by hand.

As already stated, I prefer to move the
 5 bobbins instead of the cutting mechanism, and I also prefer to provide the bobbin-carrier with a rotary movement, as thereby greater speed is accomplished. Also it will be noted that I have shown it as arranged to
 10 handle a relatively large number of bobbins at the same time, this provision enabling one boy or attendant to keep the machine supplied with bobbins notwithstanding that it is run at comparatively high
 15 speed. I prefer a knife to any other form of cutter, and prefer to have the cutting edge of said knife relatively long and oblique or wedge-shaped with relation to the yarn, because of the ease of operation and keeping
 20 in proper repair and condition of such a form of cutting device. The same remark applies to the form of carrier and bobbin-holder, the form shown being preferred for its durability and ease of operation, and be-
 25 cause it enables the boy or attendant to place the bobbins therein very rapidly, but it will be understood that I am not limited in these respects and also that the holding mechanism will necessarily vary in accordance
 30 with the different kinds of bobbins being handled. In general, I wish it understood that I am not limited to the mechanism herein set forth as my preferred mechanism, inasmuch as I believe I am the first
 35 to have produced a machine for automatically cutting through the yarn remnants left on bobbins after they have left the loom.

My invention is also broadly new in providing power means for cutting off the yarn
 40 from bobbins without injury to the latter, and is also broadly new in providing a machine with means, whether power or not, for cutting off the yarn from wooden bobbins without injury to the latter.

My invention is also broadly new in providing means in connection with the cutter for brushing or otherwise removing the cut
 45 strands of yarn from the wooden bobbins.

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

1. In a machine of the kind described, means for entering beneath the yarn on a
 55 bobbin and cutting outward transversely through the yarn for the removal of the yarn from the bobbin, the cutting means having provision for preventing injury to the bobbin from the cutting operation.

2. In a machine of the kind described,
 60 means for entering beneath the yarn on a bobbin and cutting outward transversely through the yarn for the removal of the yarn from the bobbin, the cutting means having provision for preventing injury to
 65 the bobbin from the cutting operation, and

separate means for stripping the severed strands of yarn from the bobbin.

3. In a machine of the kind described, means for cleaning the yarn from a bobbin, including a yarn-cutter to cut transversely
 70 through the bunch of yarn, and stripping means for removing the severed strands of yarn from the bobbin.

4. In a machine of the kind described, a
 75 rotary bobbin carrier containing means for maintaining the bobbin in upstanding position while the yarn is being removed, and cutting means operating to cut through the yarn on the bobbin with a downward movement whereby gravity tends to aid and
 80 cooperate with the position of the bobbin and the direction of movement of the cutting means in the removal of the yarn from the bobbin.

5. In a machine of the kind described, a
 85 rotary bobbin carrier, and means for cutting the yarn remnants from the bobbin, said carrier including means for holding the bobbin in an upright position while the yarn is being cut through by the cutting
 90 means and operating means for said cutting means.

6. In a machine of the kind described, a
 95 bobbin carrier, a cutter for cutting through the yarn remnants for their removal from the bobbin, said carrier including means supporting the bobbin in an upright position while the yarn is being cut therefrom, and mechanism to move said cutter in its
 100 cutting movement from the small end of the bobbin toward the large end thereof.

7. In a machine of the kind described, means for holding a bobbin in upright
 105 position with its small end upward, and means for cutting through the yarn remnants on the bobbin by a movement downward from said small end toward the lower
 110 large end of the bobbin.

8. In a machine of the kind described, means for supporting a bobbin in upright
 110 position with its small end upward, and means for cleaning the yarn remnants from said bobbin, including means for brushing the yarn downward on the bobbin, whereby
 115 the lower larger size of the bobbin aids the brushing means in dislodging the yarn.

9. In a machine of the kind described, means for holding a bobbin in position to be cleaned of its yarn remnants after the
 120 bobbin has left the textile machine, combined with power mechanism for automatically cutting through the yarn remnants thereof, and means for thereafter cleaning said severed yarn remnants from the bobbin
 125 after the completion of the cutting operation.

10. In a machine of the kind described, means for supporting a bobbin so that its
 130 yarn remnant is in exposed position to be removed, combined with a pointed knife

adapted to enter next to the bobbin beneath the yarn remnant and cut outward through said remnant, and means to slide said knife in the direction of the length of the knife beneath said yarn remnant.

11. In a machine of the kind described, the combination with a longitudinally slotted bobbin, of a knife as a part of the organized machine for cutting the yarn remnant from said bobbin, and means for directing said knife in line with said slot.

12. In a machine of the kind described, the combination with a longitudinally slotted bobbin, of a knife for cutting the yarn remnant from said bobbin, and means for directing said knife in line with said slot with its cutting edge facing outward.

13. In a machine of the kind described, means for cleaning the yarn remnants from a bobbin, provided with a knife having its sharp edge adapted to cut the yarn in a direction from the bobbin outward and a blunt portion to engage the bobbin during said cutting operation.

14. In a machine of the kind described, a reciprocating cutter, means to carry a bobbin into position to have its yarn remnants cut through transversely by said cutter, and means to eject said bobbin.

15. In a machine of the kind described, a reciprocating cutter, means to carry a bobbin into position to have its yarn remnants cut through transversely by said cutter, means to strip the cut yarn from the bobbin, and means to eject said bobbin.

16. In a machine of the kind described, a bobbin cutter, provided with means for receiving a longitudinally slotted bobbin, means cooperating therewith for automatically positioning said bobbin with its slot in a predetermined position, and cutting means for thereafter cutting the thread remnants from the bobbin in cooperation with said slot.

17. In a machine of the kind described, means for receiving and carrying a succession of bobbins, a cutter for cutting the yarn remnants from said bobbins, and bobbin-turning means for turning said bobbins one after the other all into the same operative position with relation to said cutter.

18. In a machine of the kind described, means for receiving and carrying a succession of bobbins, a cutter for cutting the yarn remnants from said bobbins, automatic bobbin-turning means for turning said bobbins one after the other all into the same operative position with relation to said cutter, and means for locking said bobbins in their turned position prior to the cutting operation.

19. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin holder comprising means operating to

rotate and roughly position a bobbin when presented thereto, and automatically operated means for accurately centering the rotated and positioned bobbin prior to being operated upon by said cleaning means.

20. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin holder comprising means operating to rotate and roughly position a bobbin when presented thereto, a centering stud adapted to engage the end of the bobbin, and means for automatically pressing said stud and bobbin lengthwise together prior to the operation of said cleaning means.

21. In a machine of the kind described, the combination with a brush for cleaning the yarn remnants from bobbins, of a bobbin holder comprising a centering stud having a conical end for automatically centering the adjacent end of the bobbin, and means for forcing said conical end and the bobbin together lengthwise prior to the operation of said brush.

22. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin holder comprising a stud adapted to engage the end of the bobbin and provided with a yielding friction device for holding yieldingly against the bobbin, and means to press said stud and bobbin together, and means for rotating said stud and thereby rotating said bobbin into operative position with relation to the cleaning means.

23. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin carrier, means to move said bobbin carrier with its bobbins into position for the bobbins to be operated upon by said cleaning means, said carrier being provided with a movable stud for engaging and positively holding a bobbin while being operated upon, means for automatically moving said stud into and out of engagement with a bobbin, and automatic ejecting means for ejecting said bobbin when disengaged from said stud.

24. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin holder for holding a bobbin while it is being cleaned, and an automatic ejector provided with a striking end for striking the bobbin from said holder after it is cleaned and means for moving said striking end to give a blow against the bobbin.

25. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin carrier, and step-by-step operating mechanism therefor, said cleaning means being located at said carrier at one halting position thereof, a brush located at another halting position thereof.

26. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin holder entering axially within a bobbin in holding engagement therewith for holding a bobbin while it is being cleaned, and mean to withdraw said holder from the bobbin after it is cleaned.

27. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin holder for holding a bobbin while it is being cleaned, means to withdraw said holder from the bobbin after it is cleaned, and an ejector and its operating means for ejecting said bobbin after the holder is withdrawn therefrom.

28. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin holder for holding a bobbin in vertical position while it is being cleaned, said holder entering within the enlarged lower end of the bobbin, and means for drawing said holder downward out of the bobbin to permit the removal of the latter.

29. In a machine of the kind described, the combination with means for cleaning the yarn remnants from bobbins, of a bobbin holder for holding a bobbin in vertical position while it is being cleaned, said holder entering within the enlarged lower end of the bobbin, means for drawing said holder downward out of the bobbin to permit the removal of the latter, a pivoted striker, and means to operate said striker to give the enlarged end of the bobbin a blow for its removal after said holder has been withdrawn therefrom.

30. In a machine of the kind described, means to hold a bobbin in position to have its yarn remnants cut therefrom, a pointed knife, and means to move said knife lengthwise in the direction of its point and parallel to said bobbin to cut transversely out through the yarn remnants thereof.

31. In a machine of the kind described, means to hold a bobbin in position to have its yarn remnants cut therefrom, a pointed knife pivotally mounted, means to move said knife lengthwise and parallel to said bobbin to cut transversely through the yarn remnants thereof, and means for automati-

cally moving said cutter away from the bobbin when not performing the cutting operation.

32. In a machine of the kind described, means to hold a bobbin in position to have its yarn remnants cut therefrom, an edged cutter capable of cutting through the yarn remnants with a clean cut, means to move said cutter parallel to said bobbin in cutting relation to the yarn remnants thereof, and means for holding said cutter against injurious movement substantially beyond its normal cutting path if operated in the absence of a bobbin.

33. In a machine of the kind described, means to hold a bobbin in position to have its yarn remnants cut therefrom, a wedge shaped knife having its sharp edge directed away from the bobbin, spring means for holding the back of said knife against the bobbin when cutting, and guiding means to guide the knife substantially parallel to the bobbin when cutting.

34. In a machine of the kind described, means to hold a bobbin in position to have its yarn remnants cut therefrom a wedge shaped knife having its sharp edge directed away from the bobbin, spring means for holding the back of said knife against the bobbin when cutting, guiding means to guide the knife substantially parallel to the bobbin when cutting, and means to move the knife entirely free from the bobbin at the end of its travel.

35. In a machine of the kind described, a bobbin carrier containing means for carrying a succession of bobbins removably mounted therein past a cutter, positioning mechanism, including means for rotating said bobbins in said carrier before they reach the cutter, and means for stopping all the bobbins as they rotate to a predetermined position, and a cutter for then entering beneath the yarn remnants on each bobbin as, thus positioned, it reaches the cutter, for cutting out through said yarn on the bobbin.

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

THOMAS P. WALSH.

Witnesses:

EDWARD MAXWELL,
M. J. SPALDING.