Nov. 14, 1939. E. A. TERRELL 2,179,804

YARN CUTTER FOR BOBBIN STRIPPERS

Filed June 9, 1937

Fig. 1.

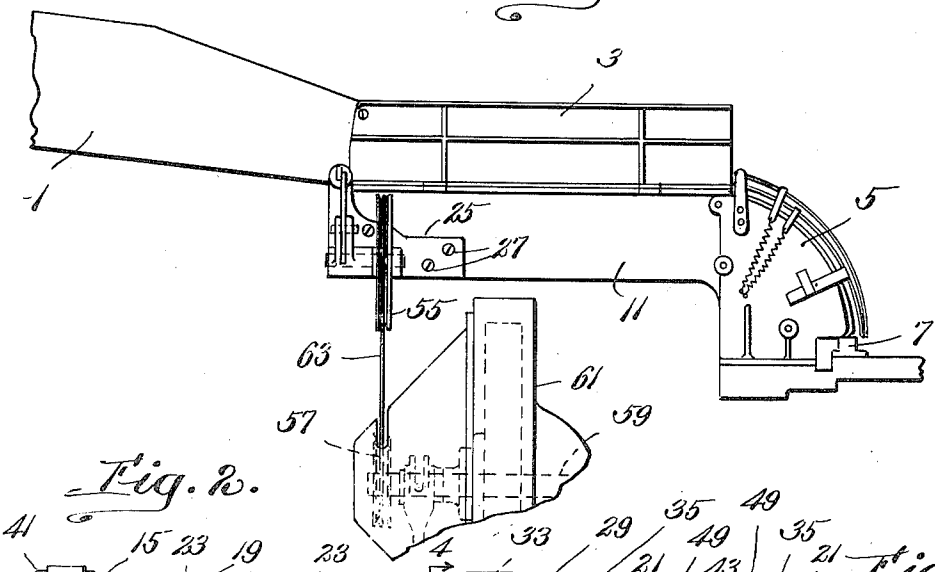


Fig. 2.

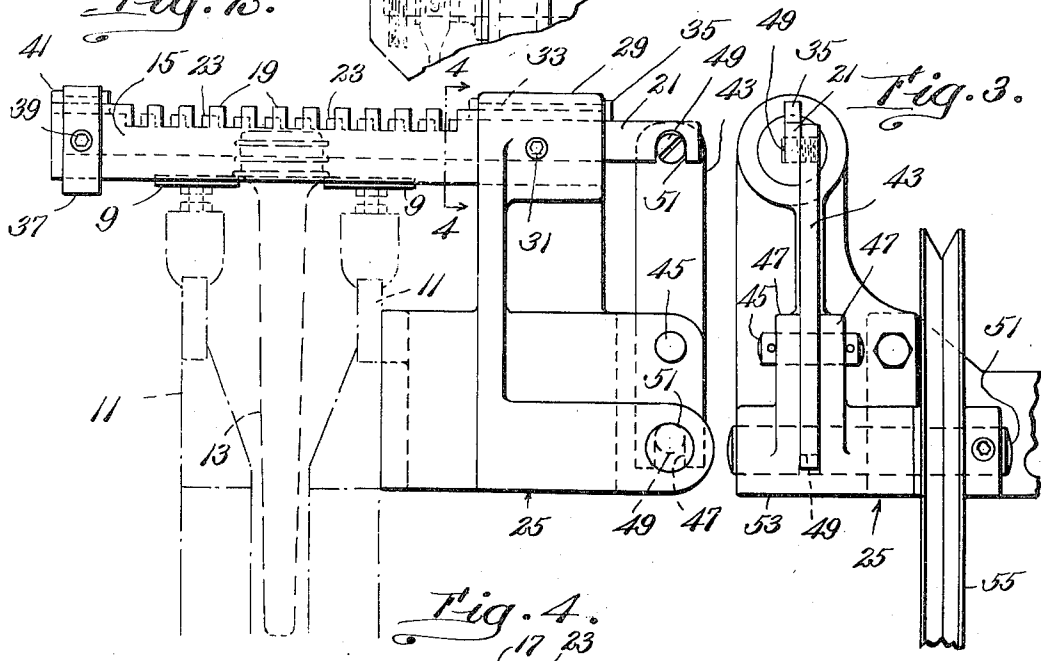
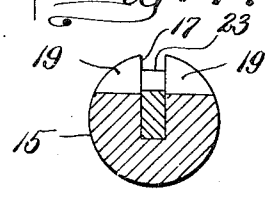


Fig. 3.

Fig. 4.



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YARN CUTTER FOR BOBBIN STRIPPERS

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8 Claims. (Cl. 28—19)

The present invention has relation and application to bobbin stripping machines and other devices in which bobbins having more or less yarn wound upon them are handled successively or in serial array. It aims to provide a cutter to clip off the trailing ends of yarn extending from such bobbins which are prone to tangle together and wrap around other bobbins and machine parts to interfere with the handling, arranging and feeding of such bobbins. Additional aims of the invention are to provide a cutter of this nature of simple and inexpensive construction and operation, certain in its action, requiring little attention to keep sharp and in working order, and above all offering no risk of injury to the operator of the machine.

To these ends, the invention comprises a cutter of the type in which each of two relatively moving parts is equipped with one or more mutually overlapping laterally extending teeth which shear off the yarns which enter between the teeth, after the manner of the familiar hair clipper or harvester mower blade. Relative motion is imparted to the blades by a vibratory drive from any going part on the machine to which it is applied, and the cutter is located so that the trailing ends of yarn are drawn or guided between or fall by gravity into the teeth of the cutter as the bobbins are fed individually or in small parcels to the bobbin stripper or other machine in which they are to be operated upon.

Other aims and features of the invention are as will be made plain hereinafter.

An illustrative embodiment of the invention is shown in the accompanying drawing, in which—

Fig. 1 is a side elevation of the hopper, bobbin chute, and a portion of the main drive shaft, of a familiar type of bobbin stripper, showing the cutter of the invention applied thereto.

Fig. 2 is an elevation of the cutter as viewed from the left of Fig. 1, indicating the bobbin chute in dot-and-dash lines to illustrate the location of the cutter with respect thereto.

Fig. 3 is an enlarged view of the cutter and its driving means, similar to Fig. 1.

Fig. 4 is a transverse section of the cutter on line 4—4 of Fig. 2.

In Fig. 1 is indicated in side elevation so much of the bobbin stripper of United States Patent No. 1,740,128 as is necessary for an understanding of the location and operation of the device of the invention, the application to such machine being illustrative only and not restrictive. At 1 is indicated a wide, shallow tray or hopper into which the bobbins to be stripped are dumped in bulk and at random, such hopper having walls which converge at the lower end of the hopper into conformation with the slant and spacing of the inclined wings 3 of the horizontal portion of the bobbin chute of the said machine. At 5 is indicated the arcuate portion of such chute, down which the bobbins descend to the stripping blades 7 by gravity after having been sorted out and arrayed in a procession within the horizontally extending portion of the bobbin chute. The spaced rails at the convergent bottom edges of the wings 3, and which support the bobbins in pendent relation by engagement with the rings on the heads of the bobbins, are indicated at 9 in Fig. 2, as well as the vertical side-members 11 of the horizontal portion of the bobbin chute. A bobbin 13 is shown in pendent relation with its head supported by the rails 9 and its barrel hanging free from the two side-members.

In the illustrated application, the cutter is located at the junction of the narrowed delivery portion or spout of the hopper 1 with the wings 3 of the bobbin chute, with its cutting teeth uppermost and elevated well above the level of the interior surface of the bottom of the hopper 1, so that the trailing end of every bobbin swept, pulled, or lifted by the hand of the operator into the space between the oblique wings 3 of the bobbin chute will be drawn over the teeth of the cutter to enter therebetween and be clipped off.

The cutter proper is of very simple construction, comprising a stationary element 15 of circular section having a radial slot 17 formed therein throughout its entire length and at least one, but preferably a series, of transverse slots extending across the slot 17 at right angles to the latter, so as to leave a row of teeth 19 at each side of the longitudinal slot 17. Slidably mounted in slot 17 is the movable cutter blade 21, having at least one, and preferably a series of transverse slots corresponding in spacing with that of the slots separating the teeth 19 of the other part of the cutter. The teeth 23 of the movable blade 21 are materially shorter than those of the stationary element 15, and the spacing of the stationary teeth 19 is close, so that the stationary teeth form a guard at each side of the movable blade preventing access and injury of the operator's hand or fingers.

The two parts thus comprising the cutter are held in cooperating relation and in the desired

operating position on the machine to which they are applied by means of a bracket 25 attached by screws 27 to the outside of the side wall 11 of the bobbin chute. At the top of this bracket is formed a sleeve 29 within which the stationary element 15 of the cutter fits snugly, being fixed therein by set-screw 31. To hold the movable blade 21 of the cutter down in the slot 17, and also to assist in keeping the cutter from changing its angular position in the sleeve 29, a keyway 33 is formed in the bore of the sleeve matching the width of slot 17 in the stationary element 15, and a key 35 having upturned ends spaced apart by the length of the sleeve 29 is inserted for half its height within the keyway 33. The other half of the height of the key 35 equals the difference in elevation between teeth 19 and 23, and fills the height of slot 17 otherwise left empty by the movable blade 21. The two parts of the cutter are similarly held together in operative relation at the other end of the cutter, by collar 37, set-screw 39, and key 41. This end of the cutter will ordinarily need no individual support.

Relative motion is imparted to the two parts of the cutter by means of a vibrating lever 43 pivoted on a pin 45 held in lugs 47 on the bracket 25, such lever having a stud 49 screwed into its upper end and engaging in a vertically elongated slot 51 in the outwardly extending end of movable blade 21. The lower end of lever 43 is slotted longitudinally at 47, and straddles an eccentric portion 49 of a jackshaft 51 rotatably mounted in hub 53 and having fixed thereon a V-pulley 55. A similar pulley 57 fixed on the end of the main drive shaft 59 of the bobbin stripper, within the housing 61 for the clutch of such machine, is connected by a belt 63 with the V-pulley 55, the housing being appropriately slotted.

Rotation of V-pulley 55 in this manner from the continuously-going shaft 59 of the bobbin-stripper acts in obvious manner through the eccentric portion 49 of jackshaft 51 and lever 43 to impart a continuous reciprocating movement to the movable blade 21 which exceeds in amplitude the pitch or spacing of the teeth thereof, whereby any trailing ends of yarn entering between the teeth thereof are speedily severed. It is to be noted that there are two cutting edges on the movable blade 21 taking part in this severing action, one at each face of the movable blade. Since the toothed part of the cutter extends across the full width of the bottom of the spout of hopper 1, and a substantial distance above such bottom, all trailing ends which rest on the bottom of the hopper will be drawn over the cutter somewhere in its length and between the teeth thereof, to be severed thereby. The side walls of the hopper at the spout, extending above as well as below the cutter, of course serve to guide all trailing ends into a path falling within the toothed length of the cutter and therefore into the teeth of the cutter. This action is made the more certain because of the fact that the toothed portion of the cutter is elevated above the straight line between a bobbin lying on the bottom of the hopper and the bunch of waste on a bobbin hanging from the rails 9 in the bobbin chute as indicated in Fig. 2; thus even if a trailing end of yarn is caught by the bobbins in the hopper and pulled tight by the operator in inserting the attached bobbin into the bobbin chute, the end will be brought into engagement with the cutting teeth of the cutter. The inward surfaces of the bobbin-receiving slot in the bobbin chute below the bobbin-supporting top surfaces of the rails 9, also cooperate in guiding the trailing ends over the cutter and into the teeth thereof.

While I have illustrated and described a certain form in which the invention may be embodied, I am aware that many modifications may be made therein by any person skilled in the art, without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to the particular forms shown, or to the details of construction thereof, but

What I do claim is:

1. In a machine for removing waste yarn from bobbins, in combination, stripping means, and a cutter to cut the ends of yarn trailing from the bobbins so as to obviate entanglement and resulting improper working, comprising a plurality of relatively moving members having mutually overlapping teeth provided with cutting edges extending at right angles to the direction of their relative movement.

2. In a machine for removing waste yarn from bobbins, in combination, stripping means, means for suspending bobbins by their heads and for feeding them relative to the stripping means, and a cutter comprising a toothed stationary blade in fixed position in the path of the ends of yarn trailing from the suspended bobbins, and a reciprocating blade having teeth extending at right angles to the direction of its movement coacting with the teeth on the toothed stationary blade to sever the trailing ends that enter between the teeth of both elements, in order to obviate entanglement and interference with the feeding.

3. In a machine for removing waste yarn from bobbins, in combination, stripping means, and a cutter in the path of movement of the ends trailing from the bobbins to cut such ends so as to obviate entanglement and resulting interference with such movement, comprising a reciprocating blade having cutting teeth, means at each side of such blade having teeth coacting with the teeth of the said blade to shear off trailing ends of yarn entering between the teeth of the reciprocating blade, and means imparting reciprocatory movement to the blade.

4. In a machine for removing waste yarn from bobbins, in combination, stripping means, means guiding the bobbins to such stripping means, and a cutter in the path of travel of the ends trailing from the bobbins to cut such ends so as to obviate entanglement and resulting interference with such movement, comprising relatively moving members having open-ended transverse slots extending at right angles to the direction of movement of the members with respect to each other, one thereof having a slot extending in the direction of such movement to receive and guide the other of such members.

5. In a machine for removing waste yarn from bobbins, in combination, stripping means, and a cutter in the path of movement of the ends trailing from the bobbins to cut such ends so as to obviate fouling and consequent interference with such movement, comprising a longitudinally slotted member having open-ended slots intersecting the longitudinal slot, a second member slidable lengthwise in the longitudinal slot of the first member and also having open-ended slots, and means causing relative longitudinal reciprocating movement between the two members.

6. In a machine for removing waste yarn from bobbins, in combination, stripping means, and a

cutter in the path of movement of the ends trailing from the bobbins to cut such ends so as to obviate fouling and consequent interference with such movement, comprising a member having a longitudinal slot and open-ended slots intersecting the longitudinal slot at right angles, a second member also having open-ended slots and slidably mounted in the longitudinal slot in shearing relation with the edges of the first member's open-ended slots at both sides of the first member's longitudinal slot, and means causing relative reciprocating movement between the two members.

7. In a machine for removing waste yarn from bobbins, in combination, stripping means, and a cutter in the path of movement of the ends trailing from the bobbins cutting off such ends to obviate entanglement in their subsequent progress through the machine, comprising a blade moving back and forth between stationary abutments spaced apart in the direction of travel of the blade and on both sides of the blade, the blade working in shearing relation with the abutments at two sides of the blade.

8. In a machine for removing waste yarn from bobbins, in combination, stripping means, means for suspending bobbins by their heads, and a cutter in the path of the ends of yarn trailing from the suspended bobbins, comprising a plurality of relatively moving members having mutually overlapping teeth extending at substantially right angles to the direction of their relative movement cutting off such ends to obviate intertangling.

EDGAR ALLEN TERRELL.