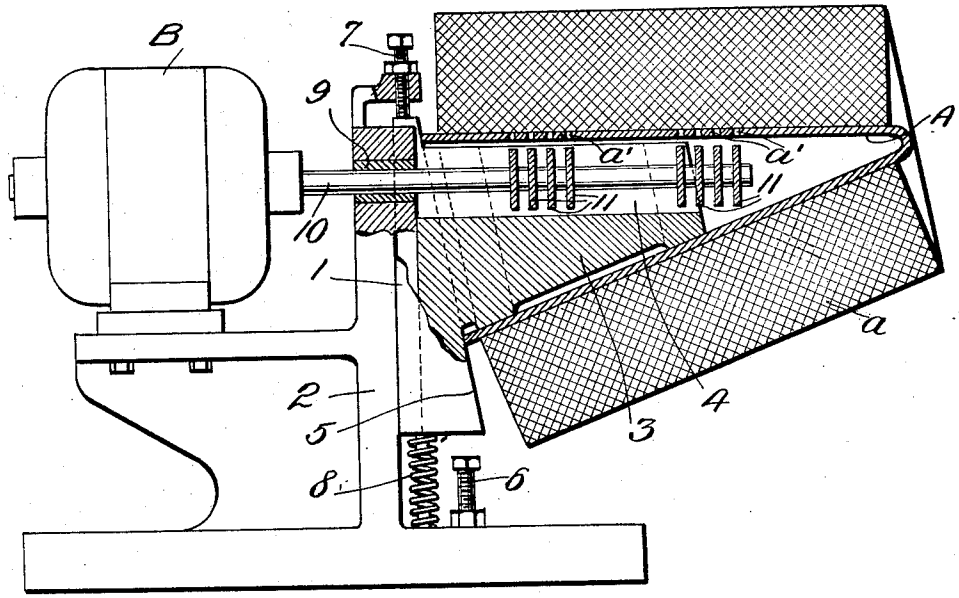
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DEVICE FOR PERFORATING THE CORES OF YARN CONES

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DEVICE FOR PERFORATING THE CORES OF YARN CONES

Original application filed November 3, 1925, Serial No. 66,533. Patent No. 1,724,015. Divided and this application filed June 13, 1929. Serial No. 370,369.

This invention relates to a device for perforating the cores of yarn cones and other wound masses of yarn, in order to permit the passing of dyes, air or other fluids through such cores.

The present application is a division of my copending application, filed November 3, 1925, Serial No. 66,533.

Cotton thread or other yarn is usually supplied to the knit goods manufactures in the form of cones wound upon hollow conical cores or spools of relatively stiff cardboard or equivalent comparatively inexpensive material.

A perforating device embodying my invention provides for bringing a rotating cutter against the inner surface of such a core to form a burrless perforation in the core, and for preventing the cutter from entering the mass of yarn wound on the core.

A specific perforating device embodying the invention is illustrated in the annexed drawing which is a longitudinal sectional view.

The device illustrated comprises a bracket 1, slidable vertically upon a suitable support 2, and provided with a horizontally projecting tapered mandrel 3 having a longitudinally extending recess 4 in its upper side and open at the top.

The base portion of the bracket 1 extends some distance beyond the adjacent portion of the tapered mandrel 3, and is provided with an inclined face 5 disposed in a plane at right angles to the axis of the mandrel to form an abutment for the larger end of the hollow core A carrying the yarn cone *a*.

The base of the bracket 1 is slidable vertically upon the adjacent portion of the support 2 between lower and upper adjustable limiting stops 6 and 7 on the support 2, and is yieldingly held against the upper stop 7 by a coiled spring 8.

The recess 4 in the upper side of the mandrel 3 extends from end to end thereof in alignment with a bearing 9 on the support 2.

A rotary shaft 10 is journalled in the bearing 9 and has one end extended into and through the recess 4, and provided with separate sets of axially spaced rotary cutters 11 of slightly less diameter than the transverse width of the slot or recess 4, the outer end of said shaft being connected directly to the armature shaft of a motor B which is also mounted upon the support 3.

The core A with the yarn cone *a* is placed by hand or otherwise around and upon the tapered mandrel 3 with its larger end face against the inclined abutment 5, the periphery of the mandrel being made to correspond approximately to the interior diameter and taper of the portion of the core A which it is adapted to receive, so that, when the core with the yarn cone thereon is pressed upon the mandrel, the upper portion of the core will normally lie directly over the adjacent open side of the recess 4 and will extend across and axially some distance beyond the upper edges of the separate sets of cutters 11.

When the core with the yarn cone thereon is properly adjusted upon the mandrel 3, the yarn cone and bracket 1 carrying the mandrel 3 are pressed downwardly against the action of the spring 8 to cause the upper edges of the cutters to cut through the overlying portions of the core to form the necessary perforations or slots therein until restrained by the engagement of the lower end of the bracket 1 with the lower stop 6, which is adjusted to limit the downward movement of the mandrel and cone thereon to just sufficient distance to cause the cutters to cut through the upper side of the core the thickness thereof, by which operation the material cut away is carried into the recess 4, thereby avoiding the formation of burrs on the periphery of the core adjacent the openings, and also preventing the mutilation of the inner layer of yarn adjacent the core.

Immediately following this operation, the pressure upon the cone is relieved to allow the spring to return the mandrel with the cone thereon upwardly until limited by the stop 7 which is adjusted so as to prevent contact of the lower wall of the recess 4 with the cutters 11.

The core with the yarn cone thereon may then be turned by hand about the axis of the mandrel 3 to present another imperforate portion of the core in the open upper side of

the recess 4, following which the cone and mandrel may again be depressed against the action of the spring 8 to form other sets of openings in the core, these operations being usually repeated until several sets of openings have been formed in different portions of the core, but, in some instances, one row of apertures may be sufficient in which case a single operation only will be necessary.

What I claim is:

1. An apparatus for perforating cores of yarn bobbins, comprising a rotary cutter shaft and a cutter thereon, a support adapted to hold a bobbin and having a recess in which said cutter turns, and means permitting relative movement between said support and said cutter transverse to the cutter shaft to bring the cutter against a core on the support.

2. An apparatus for perforating cores of yarn bobbins having means to rotate a cutter about an axis, a support adapted to hold a bobbin and having a recess in which the cutter turns, means whereby said support may be moved laterally to the axis of rotation of the cutter to bring the cutter against a core on the support, and means limiting the movement of said support to prevent the cutter from striking the yarn.

3. A device for perforating the core of a wound mass of yarn, comprising two slidably connected members, a rotary cutter mounted on one of said members, a mandrel mounted on the other of said members and containing in one side an open recess for said cutter, means for limiting the relative movement of said slidably connected members in one direction to prevent the cutter from striking the bottom of said recess, and means for limiting said relative movement in the opposite direction when said cutter projects from said recess a distance equal to the thickness of the core to be perforated.

4. A device for perforating the core of a wound mass of yarn, comprising two slidably connected members, a rotary cutter mounted on one of said members, a mandrel mounted on the other of said members and containing in one side an open recess for said cutter, a stop for limiting the relative movement of said slidably connected members in one direction to prevent the cutter from striking the bottom of said recess, a second stop for limiting said relative movement in the opposite direction when said cutter projects from said recess a distance equal to the thickness of the core to be perforated, and yieldable means urging one of said slidable members into contact with said first stop.

5. A device for perforating the cores of yarn cones, comprising a frame, a shaft journalled on said frame, a rotary cutter on said shaft, a bracket slidably mounted on said frame for movement transverse to said cutter shaft, a conical mandrel on said bracket having one of its sides parallel to said cutter shaft and containing in its said side an open recess for said cutter, and adjustable means for limiting the sliding movements of said bracket.

In testimony whereof I have hereunto set my hand.

WARD N. GERE.