May 23, 1939. F. J. KENT 2,159,385

WINDING MACHINE

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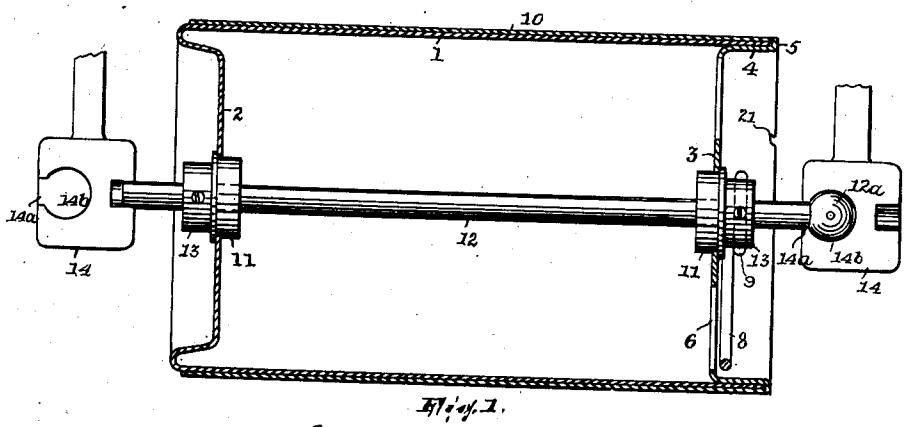


Fig. 1.

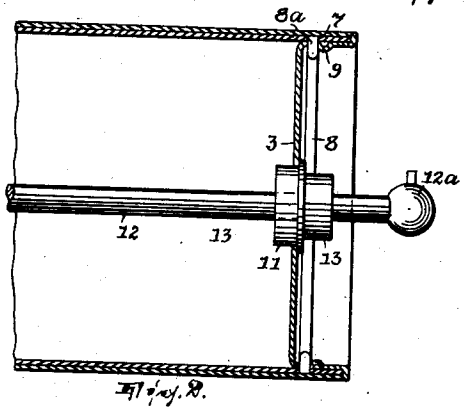


Fig. 2.

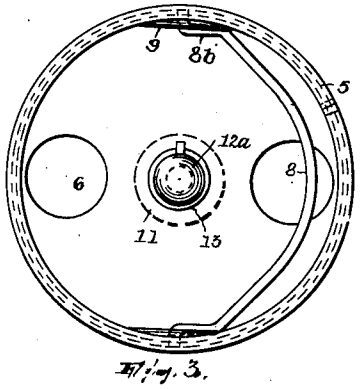


Fig. 3.

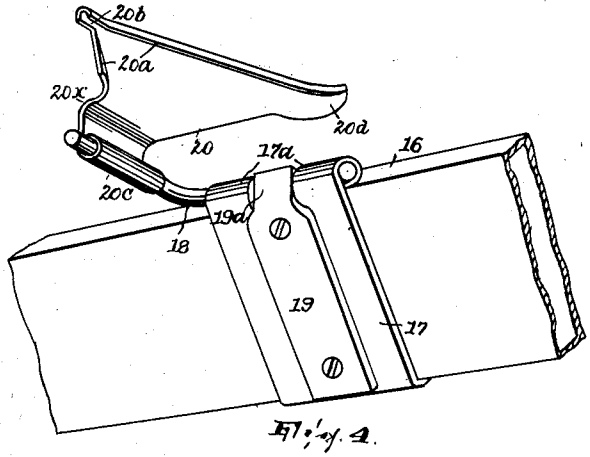


Fig. 4.

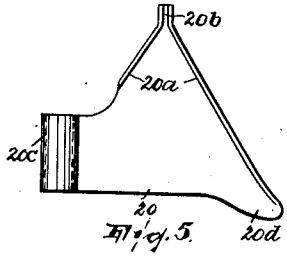


Fig. 5.

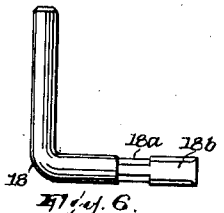


Fig. 6.

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WINDING MACHINE

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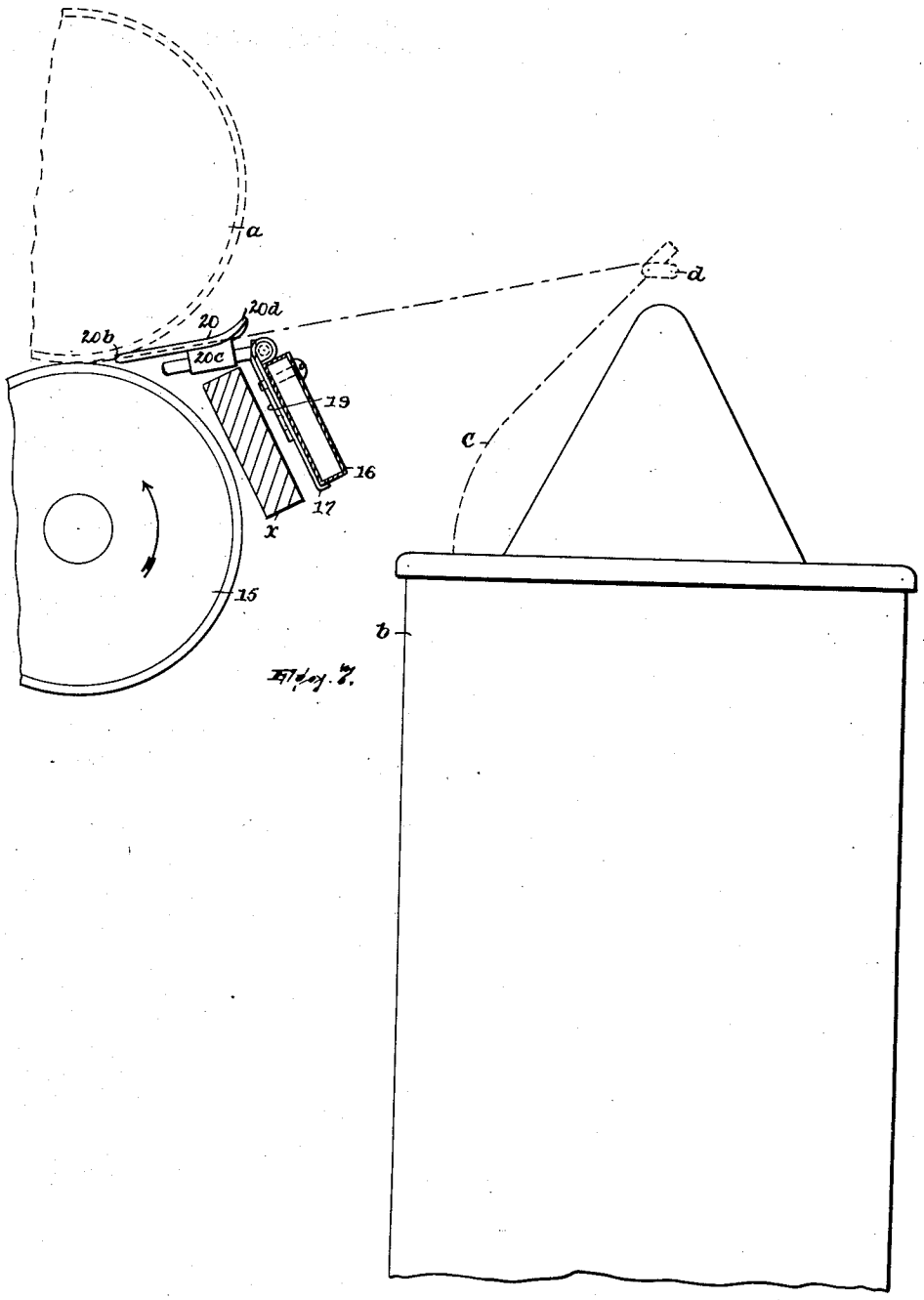


Fig. 7.

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UNITED STATES PATENT OFFICE

2,159,385

WINDING MACHINE

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Application January 22, 1938, Serial No. 186,289

6 Claims. (Cl. 242—118)

This invention relates to mechanism for winding yarn and is applicable especially to such mechanism when the same includes a rotary driver having its axis horizontal and the wound package is formed by winding it on a core structure in superposed relation and having its axis parallel with the driver.

According to the invention the core structure includes a barrel, a core proper which is in telescoped relation to the barrel, and novel means to secure the core proper on the barrel. In the preferred form the core structure also includes an axial spindle on which the barrel is journaled and this spindle and the means by which it is supported are constructed in a novel way whereby there may be no displacement of the spindle, when winding is proceeding, either axially or otherwise except upwardly as the mass of windings develops, and yet the spindle may be readily detached from the supporting means.

According to the invention, further, there is novel means for guiding the yarn to the wound mass being formed, which means is adapted for ready threading thereof especially when said means is of the type which is traversed during the winding.

Fig. 1 shows the improved core structure largely in longitudinal section and its supporting brackets in plan and broken away;

Fig. 2 is a fragmentary longitudinal section of the core structure in a plane perpendicular to that of Fig. 1;

Fig. 3 is a right-hand end elevation of the core structure;

Fig. 4 is a perspective view, as seen from below, of the traverse-rail and yarn-guide;

Figs. 5 and 6 are underneath plan views of the yarn-guide; and

Fig. 7 shows the relative positions of the yarn-supply, driver, core structure and the traverse-rail and yarn guide as viewed in side elevation, the traverse-rail and a part of the machine frame appearing in section.

To form the barrel of the core structure in the present example a sheet-metal blank is drawn to form a cylinder 1 having at one end thereof an inset discal portion 2 and another sheet-metal blank is drawn to form a discal portion or head 3 having a cylindrical flange 4 provided at its extremity with a peripheral bead 5, the head 3 preferably having apertures 6. The head is permanently secured in the open end of the cylinder in any way, as by welding, so that the bead abuts said end of the cylinder. The annular projection of the barrel formed by the end of the cylinder and the flange of the head 3 have a pair of diametrically opposite bearing holes or bearings 7. These receive the alined outwardly diverted trunnions 8*a* of a curved spring-wire bail 8. Portions 8*b* of the bail adjoining its trunnions are parallel to each other. Outwardly of the bearing holes said annular projection of the head has cams 9 in the form of ribs which extend so as to conform to chords of said projection perpendicular to the diameter in which the holes lie. The bail tends to expand and thus urge its portions 8*b* against said projection of the barrel. When the bail is depressed or lies against the head 3 these portions stand clear and inward of the cams and so permit the trunnions to project outwardly through the bearing holes. But when the bail is elevated or turned in the bearings toward the plane of the axis of the barrel the cams urge the portions 8*b* together thus retracting the trunnions. (In the first position the bail may traverse one of the apertures 6, which then permits a finger-hold on the bail.)

The core proper 10 is a plain cylinder of any suitable light, strong material, say Bakelite or the like, having such diameter as snugly to fit the cylinder 1 of the barrel and yet to be slipped off the same and having about the same length as the cylinder. To assemble it with the barrel the bail is first moved from the depressed position whereupon, the core proper being made to abut the bead 5, the bail is moved to the position shown, whereby the trunnions will grip the core proper and hold it against displacement on the barrel. To remove the core proper the bail is elevated and used to support the assembly in pendant state, whereupon the core proper will fall away, at least when loaded with yarn.

In this example the body formed by the core proper and barrel is mounted on and so as freely to rotate with respect to an axial portion. For this purpose the discal portion or head 2 and head 3 have central ball-bearings 11 in which said axial portion, in the form of a spindle 12, is journaled, there being collars 13 on the spindle arranged to prevent axial displacement of the barrel relatively thereto. This spindle is to coact with spaced supports, as brackets 14, of the winding machine frame to confine it against displacement transversely of its axis in any direction except upwardly when the winding is proceeding and it is further to coact with one of such brackets to confine it against axial displacement. For these purposes the ends of the spindle are received in slot-like sockets 14*a* in the brack-

ets open upwardly and also toward each other and one in part formed by a downwardly formed cylindrical bore 14*b* in which fits a spherical head or knob 12*a* on the spindle. The yarn is to be wound on the core structure traverse-fashion and if the shaft is held against all displacement, axially or transversely of its axis, except upwardly, as by my construction, the windings will be formed so that the ends of the wound mass will be perfectly square or otherwise definitely and compactly developed. When the winding has been completed the spherical form of the head permits the core structure to be removed from the brackets although this may involve some angular displacement of the spindle.

In Fig. 7 there is shown at 15 the rotary driver of the winding machine, a fixed part, as a rail, of which is shown at *x*. The core structure, designated *a*, is assumed to be maintained by the brackets 14 in a position above the driver and so that the core proper 10, or the mass of windings formed thereon, rests peripherally in contact with the driver. The yarn-supply *b* (say a spinning unit such as that shown in my application Serial No. 169,830) delivers the yarn *c* upwardly to a fixed guide *d* from whence it travels on its way to the core structure in engagement with yarn guiding and traversing means constructed as follows: 16 is a traverse-rail reciprocated toward and from the observer. Secured to it is a plate 17 having a pair of spaced bearings 17*a* above the rail. These bearings receive one arm of an angle-member 18 having such arm formed with a circumferential groove 18*a* and with a flat 18*b* extending from the far end of the arm to the groove. An elastic strip 19 having a tongue 19*a* which enters between the bearings is secured to the plate. Said arm of the angle-member may be entered to the bearing with its flat presented to the tongue and until its groove registers therewith, and when the arm is turned the tongue will enter the groove to prevent displacement of the angle-member axially of its arm. The tongue grips said arm frictionally and so will hold the angle-member in any angular position.

The guide is formed by a generally triangular plate 20 having two of its edges bent in the same direction out of the plane of the plate to form flange-like abutments 20*a* which terminate to form a guide-proper at 20*b*, the face of the plate between the abutments affording a yarn-contact face. Said abutments project downwardly, and parallel with the axis of the guide an extension of the plate is bent downwardly in a curve to form a deflector at 20*x* and terminates in a sleeve 20*c*. The abutment 20*a* remote from this sleeve extends from the guide-proper clear across the plate and at the far end of such abutment the angular portion 20*d* of the plate is bent up to form a deflector. The sleeve 20*c* is welded on the free arm of the angle-member 18.

In operative position the yarn-control face of the guide, facing here downwardly, is substantially parallel to that plane, tangential with respect to the core structure, in which the yarn, under draft between the latter and the guide *d*, lies, the guide being so positioned that the yarn in the traverse of the guide is confined between the abutments and so undergoes traverse; the guide proper extends well into the nip formed by the driver and core structure.

To start the winding the operator catches the yarn in a nick 21 (Fig. 1) at one end of the barrel, holding the yarn until one or more convolutions have been formed on the core structure. He then releases the yarn and on the first stroke of the guide 20 toward the observer the deflector 20*d* will cam the yarn under the corresponding abutment so that it may then come to underlie the yarn-contact face, engaged in the guide proper. If the first stroke is from the observer the other deflector 20*x* will cam the yarn upwardly so that the guide 20 may pass under the yarn and continue such stroke free thereof, and on the next stroke deflector 20*d* will become effective as explained.

Having thus fully described my invention what I claim is:

1. A wound-mass core structure including a barrel member, a member forming a core proper and arranged in telescoped receiving relation to and movable on the barrel member, and an elastic element spanning the core structure with its ends spaced from each other circumferentially of said structure, said element releasably interlocking the members together.

2. A wound-mass core structure including a barrel member, a member forming a core proper and arranged in telescoped receiving relation to and movable on the barrel member, and an elastic element spanning the core structure with its ends spaced from each other circumferentially of said structure, said element being supported by the barrel member and releasably engaging and holding to the latter the other member.

3. A wound-mass core structure including a barrel member, a member forming a core proper and arranged in telescoped receiving relation to and movable on the barrel member, and an elastic bail spanning the core structure transversely of its axis and providing oppositely projecting trunnions journaled in one member and one of which trunnions releasably engages and holds thereto the other member.

4. A wound-mass core structure including a barrel member, a member forming a core proper and arranged in telescoped receiving relation to and movable on the barrel member, and an elastic bail spanning the core structure transversely of its axis and providing outwardly projecting trunnions journaled in the barrel member and one of which trunnions releasably engages and holds thereto the other member.

5. A wound-mass core structure including a barrel member, a member forming a core proper and arranged in telescoped receiving relation to and movable on the barrel member, and an elastic bail occupying a plane cutting the core structure transversely of its axis and providing trunnions journaled in one member and one of which trunnions releasably engages and holds thereto the other member, the former member having means to cam the bail out of engagement with the latter member when the bail is angularly displaced from said plane.

6. A wound-mass core structure including a barrel member, a member forming a core-proper and arranged in telescoped receiving relation to and movable on the barrel member, an elastic element spanning the core structure transversely of its axis and movable in one member and releasably engaging the other member whereby to hold the core-proper member against movement, the member in which said element is so movable having means to cam said element out of engagement with the other member when said element is moved.

FREDERICK J. KENT.