April 18, 1939. G. S. FRASER 2,155,041

SLIVER BALLING MACHINE AND YARN AND THE LIKE WINDING MACHINES

Filed March 19, 1938 2 Sheets-Sheet 1

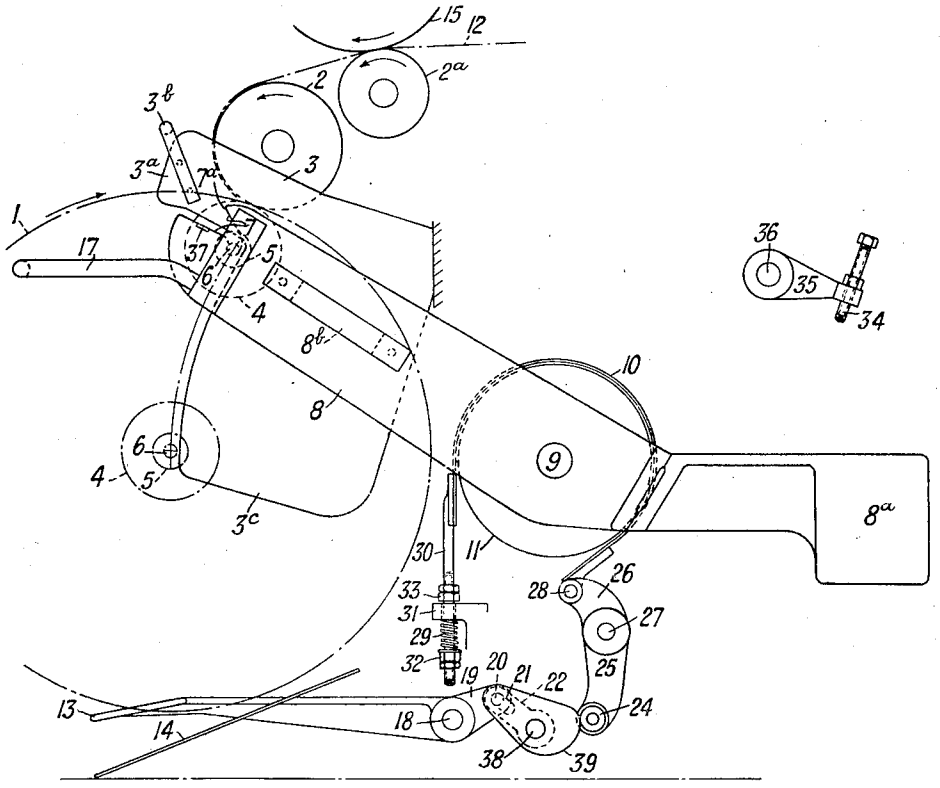


FIG. 1.

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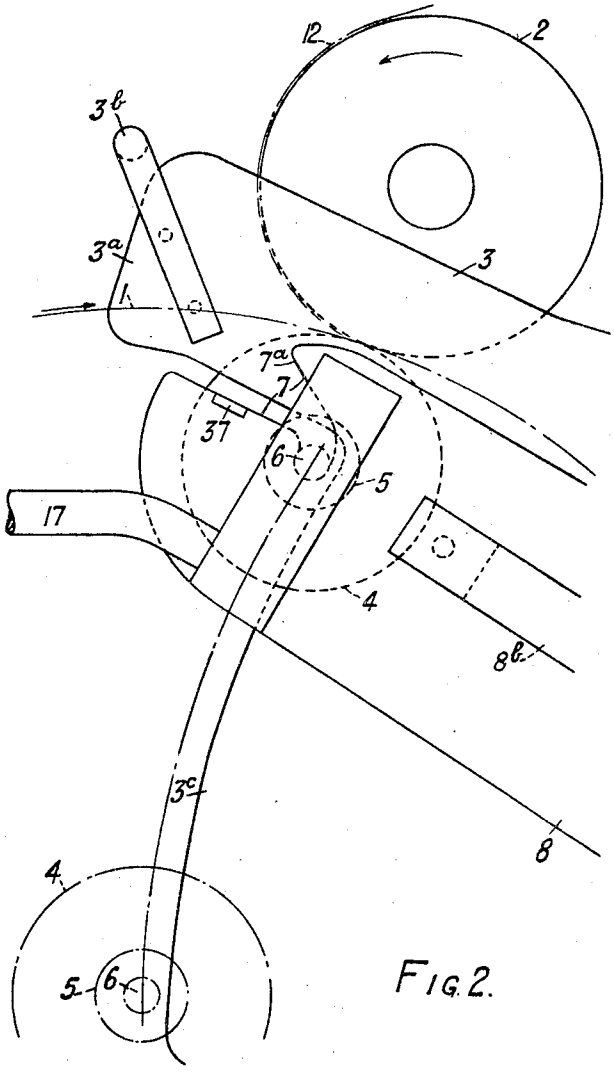


FIG. 2.

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UNITED STATES PATENT OFFICE

2,155,041

SLIVER BALLING MACHINE AND YARN AND THE LIKE WINDING MACHINES

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4 Claims. (Cl. 19—158)

This invention relates to sliver balling machines, yarn-winding machines and the like, of the type in which a so-called ball or roll of sliver or a yarn package, hereinafter referred to as the roll, is wound by frictional contact with a driving friction roller.

In a machine according to the invention the roll is formed between two stationary end plates which shroud only the nip of the driving roller with the roll and part of the end surface of the roll.

It is found that, when sliver or yarn being wound is only locally confined between two such end plates, a well-formed roll can be built under considerable pressure transmitted from the centre.

In the case of a sliver roll the fibre remains bound together, and sustains very considerable pressure without any sign of collapse of the material which is external to the confines of the end plates. The resulting roll has clean square edges throughout its radial depth and may be delivered very readily from between such end plates, which do not present the same frictional resistance as the large-surfaced cheek plates heretofore used.

With the use of such confining end plates in a yarn-winding machine, it is possible largely to avoid "cob-webbing", which is apt to cause breakages in the subsequent unwinding processes.

In a practical construction of sliver balling machine according to the invention the drive is taken from a cork-covered roller which may be additional to or may take the place of the usual delivery roller of a drawing frame for bast fibres such as jute, flax or hemp, or other textile fibre. The roll is built on a boss strung on an arbor having non-revoluble trunnions sustained in open-ended slots presented by a counterweighted bifurcated lever which swings on its pivot during the building of the roll. The requisite pressure for building the roll is applied by means of a friction band wrapping a drum coaxial with the pivot of the lever and adapted to be released by actuation of a pedal device or the like on completion of the roll. Below the position occupied by the roll during its formation is an inclined plate or the like down which the finished roll of sliver rolls when released. In the descent of the lever, when the roll alights on the inclined plate, the trunnions vacate the slots and thus free the roll.

A machine according to the invention, is illustrated in the accompanying drawings in which Fig. 1 is an end elevation, and Fig. 2 a fragmentary end elevation drawn to a larger scale.

As shown, 1 denotes a roll or ball of sliver which has been wound by frictional contact with a cork-covered driving friction roller 2, and which is only partially shrouded at its ends by two spaced stationary end plates 3, one only of which is shown, shrouding only the nip of the driving roller 2 with the roll 1 and part of the end surface of the roll. The end plates 3 are fixed to the frame of the machine and are parallel to one another, being provided with out-turned end portions 3^a, and with a bridge bar 3^b which prevents spreading movement of the plates. The roller 2 shown is additional to the usual delivery roller 2^a of a drawing frame for bast fibres. The roll of sliver is built on a boss 4, preferably of wood, and each of the end plates 3 presents a depending extension 3^c adapted to locate the boss 4 endwise during the building of the roll. The boss 4 is strung on an arbor 5 having non-revoluble trunnions 6 received in open-ended slots 7 presented by a counterweighted bifurcated lever 8 which swings downwardly on its pivot 9 during the building of the roll. Adjustable pads 8^b carried by the lever 8 slide against the outer surfaces of the extensions 3^c of the end plates whereby to prevent spreading movement of said extensions. The requisite pressure for building the roll is supplied by means of a friction band 10 wrapping a drum 11 which is movable with the lever 8 and is adapted to be released, on completion of the roll, by elevation of a pedal 13 pivoted at 18 and operable by the foot of the attendant. A rear arm 19 of the pedal carries a stud 20 which is movable in a slot 21 in a lever 22 secured on a rock spindle 38 carrying also a cam 39 engaged by a follower 24 on the lower arm 25 of a double-armed lever 25, 26 pivoted at 27. The upper arm 26 of the lever 25, 26 is operatively connected by a pivot 28 with one end of the band 10 which is tensioned by a compression spring 29 acting on the other end of the band 10 through the medium of a rod 30 guided through a hole in a lug 31 on the frame. The spring 29 is strung on the rod and is compressed between a nut 32 on the rod and the underside of the lug 31. A stop-nut 33 on the rod is engageable with the lug 31 whereby to limit the movement of the rod under the action of the spring 29. In the fully depressed or normal position of the pedal 13 the pedal is sustained by the engagement of the stud 20 with the outer end of the slot 21, and the part of the cam 39 of greatest radius is engaged by the follower 24, so that the band 10 is held in frictional engagement with the drum 11 under the tension exercised on the band by the lever 25, 26 in opposition to the action of the spring 29. On elevation

of the pedal to effect release of the band 10, the stud 20 travels down the slot 21 and the cam is so rotated that the lever 25, 26 rocks about its pivot 27 and releases the band. When the pedal is subsequently depressed in order to reapply the pressure at the commencement of the building of a new roll, the tension applied to the band 10 tends to rotate the drum 11 and therewith the lever 8 in the direction to move the boss 4 towards the roller 2.

The lever 8 is shown in the position which it occupies at the start of a roll-building operation, the boss 4 being in frictional contact with the roller 2. Sliver 12 passes between the delivery roller 2a and a cooperating pressing roller 15, and around the driving roller 2, before entering the nip of the roller 2 with the boss 4 or with the roll of sliver being built. When it is required to produce a cross-wound roll, a reciprocatory sliver guide is introduced between the rollers 2a and 2. As will be understood, as the sliver roll builds upon the boss 4 the lever 8 rocks downwardly about its pivot 9 in opposition to the resistance of the friction band 10 and the action of the counterweight 8a of the lever. When the roll attains finished diameter as indicated at 1, the counterweight 8a contacts with an adjustable screw 34 on a lever 35 secured on a shaft 36, whereby the shaft 36 is rocked and set off motion actuated to stop the machine. When now, the band 10 is released by elevation of the pedal 13, the lever 8 may be manually depressed slightly by actuation of a handle 17 thereon, until the completed roll alights on an inclined plate 14. Further depression of the lever 8 causes the trunnions 6 to vacate the slots 7, and, as the trunnions 6 come into contact with sloping upper boundaries 7a of the slots, the trunnions are forced clear of the slots and the roll of sliver rolls down the plate 14 and is thus ejected.

After release of the roll, and providing that the pedal 13 is not depressed, the lever 8 swings upwardly to starting position under the action of its counterweight 8a. When, now, the pedal 13 is depressed, the band 10 re-engages the drum 11 and thus brakes the lever 8 for a subsequent roll-forming operation.

The lever 8 is provided with rubber pads 37 which, by rubbing on the end faces of the boss 4, prevent stray fibres from being caught and wound around the trunnions 6.

I claim:

1. In a machine for balling sliver, the combination with a bifurcated lever comprising laterally spaced arms each formed with an open-ended bayonet slot, a boss on which the sliver ball is to be wound, an arbor penetrating said boss and having trunnions fitted in said slots, a rotary driving roller adapted to frictionally engage the sliver ball being wound, vertically immovable plates embraced by said arms and clear of said slots, said plates formed and positioned to shroud the nip of said driving roller with the sliver ball and part only of the end faces of the sliver ball, and a landing surface to receive the finished sliver ball on depression of the free ends of said arms and by upward reaction on the sliver ball to dislodge said trunnions from said slots.

2. In a machine for balling sliver, the combination with a bifurcated lever comprising laterally spaced arms each formed with an open-ended bayonet slot, a boss on which the sliver ball is to be wound, an arbor penetrating said boss and having trunnions fitted in said slots, a rotary driving roller adapted to frictionally engage the sliver ball being wound, vertically immovable plates embraced by said arms and clear of said slots, said plates formed and positioned to shroud the nip of said driving roller with the sliver ball and part only of the end faces of the sliver ball, a landing surface to receive the finished sliver ball, and manually operable means effective to bring about depression of the free ends of said arms whereby to effect the landing of the sliver ball on said surface and disengagement of said trunnions from said slots.

3. In a machine for balling sliver, the combination with a bifurcated pivoted lever comprising laterally spaced arms, a boss on which the sliver ball is to be wound, an arbor penetrating said boss and having trunnions normally engaging said arms, a rotary driving roller disposed above said boss and adapted to frictionally engage the sliver ball being wound, vertically immovable plates embraced by said arms, said plates formed and positioned to shroud the nip of said driving roller with the sliver ball and part only of the end faces of the sliver ball, pads carried by said levers and engaging the outer faces of said end plates, a drum coaxial with the pivot of said lever and moving with said lever, a friction band wrapping said drum, a pedal operable to maintain said band in frictionable engagement with said drum, connections between said pedal and said band whereby the initial depression of said pedal tensions said band and thereby rocks said lever in the direction to move said boss towards said driving roller, and means whereby on elevation of said pedal said trunnions are disengaged from the lever arms.

4. In a machine for balling sliver, the combination with a bifurcated lever comprising laterally spaced arms each formed with an open-ended bayonet slot, a boss on which the sliver ball is to be wound, an arbor penetrating said boss and having trunnions fitted in said slots, a rotary driving roller adapted to frictionally engage the sliver ball being wound, vertically immovable plates embraced by said arms, said plates formed and positioned to shroud the nip of said driving roller with the sliver ball and part only of the end faces of the sliver ball, means for depressing manually the free ends of said arms, a device for braking the rocking movement of said lever in the direction away from said driving roller, and foot-operated means to apply said brake and urge said lever in the direction towards said driving roller.

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