

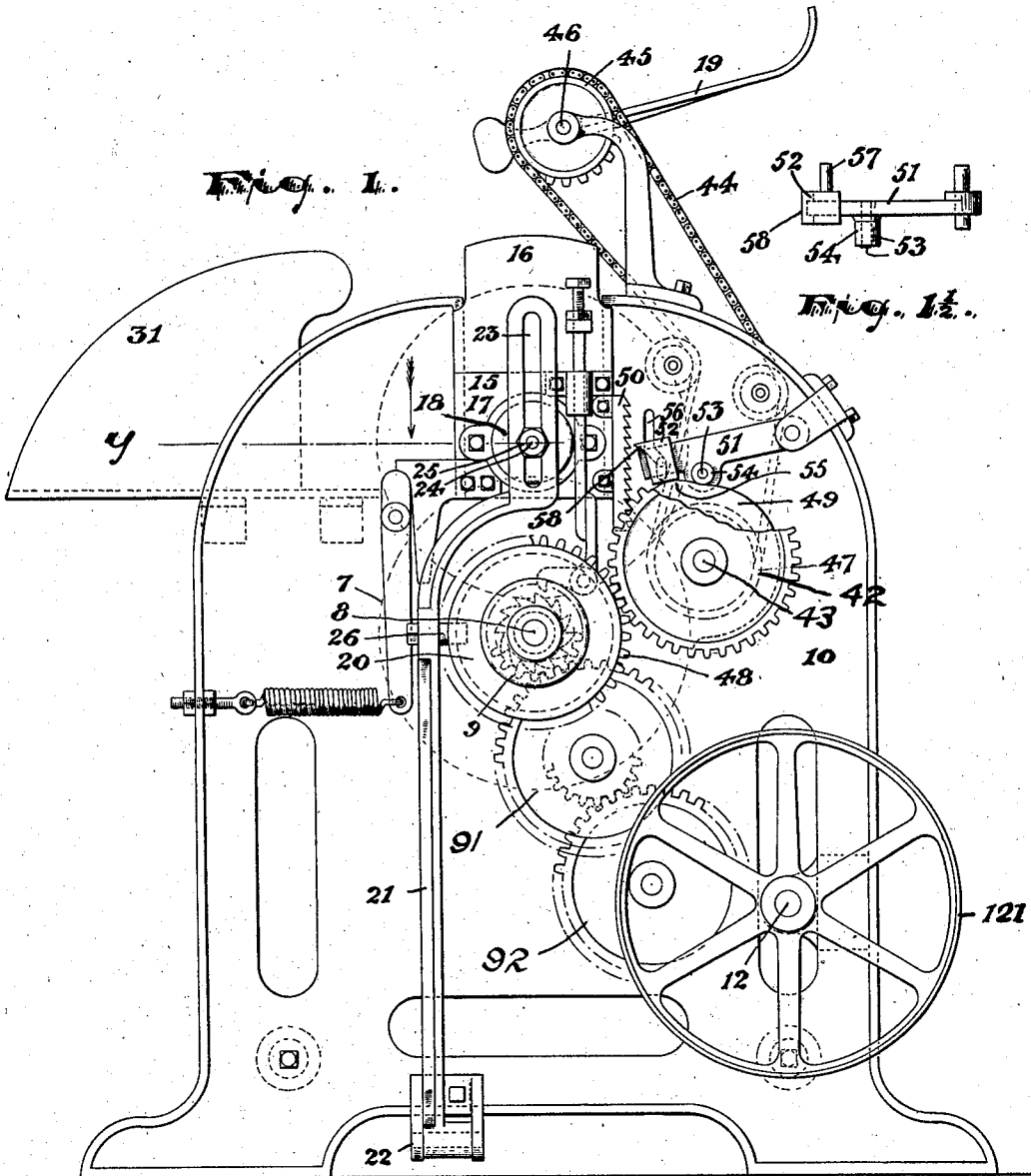
No. 827,332.

PATENTED JULY 31, 1906.

G. J. TORRANCE.
AUTOMATIC WORSTED BALLING MACHINE.

APPLICATION FILED NOV. 16, 1905.

4 SHEETS—SHEET 1.



WITNESSES:

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Eitelburg Pell

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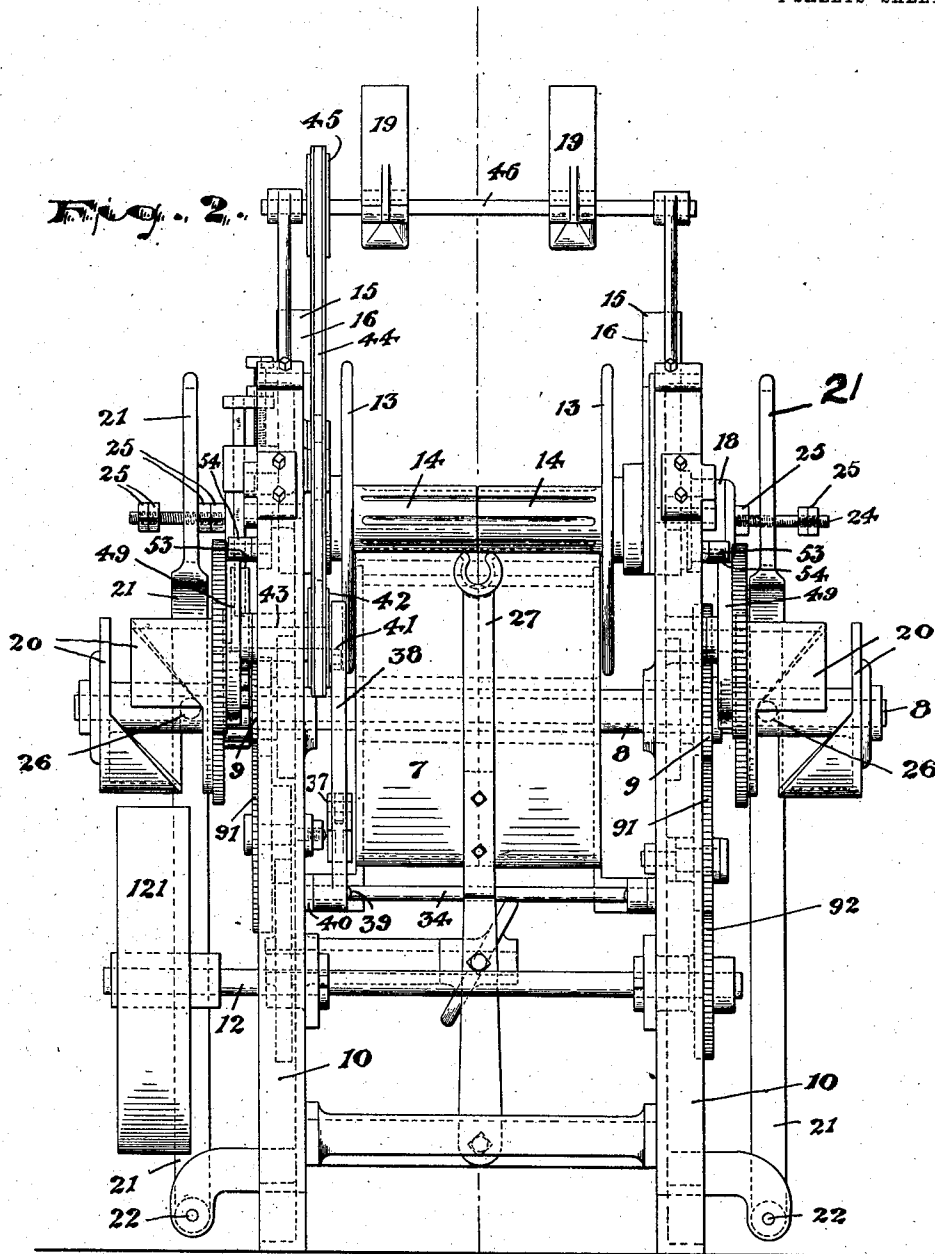
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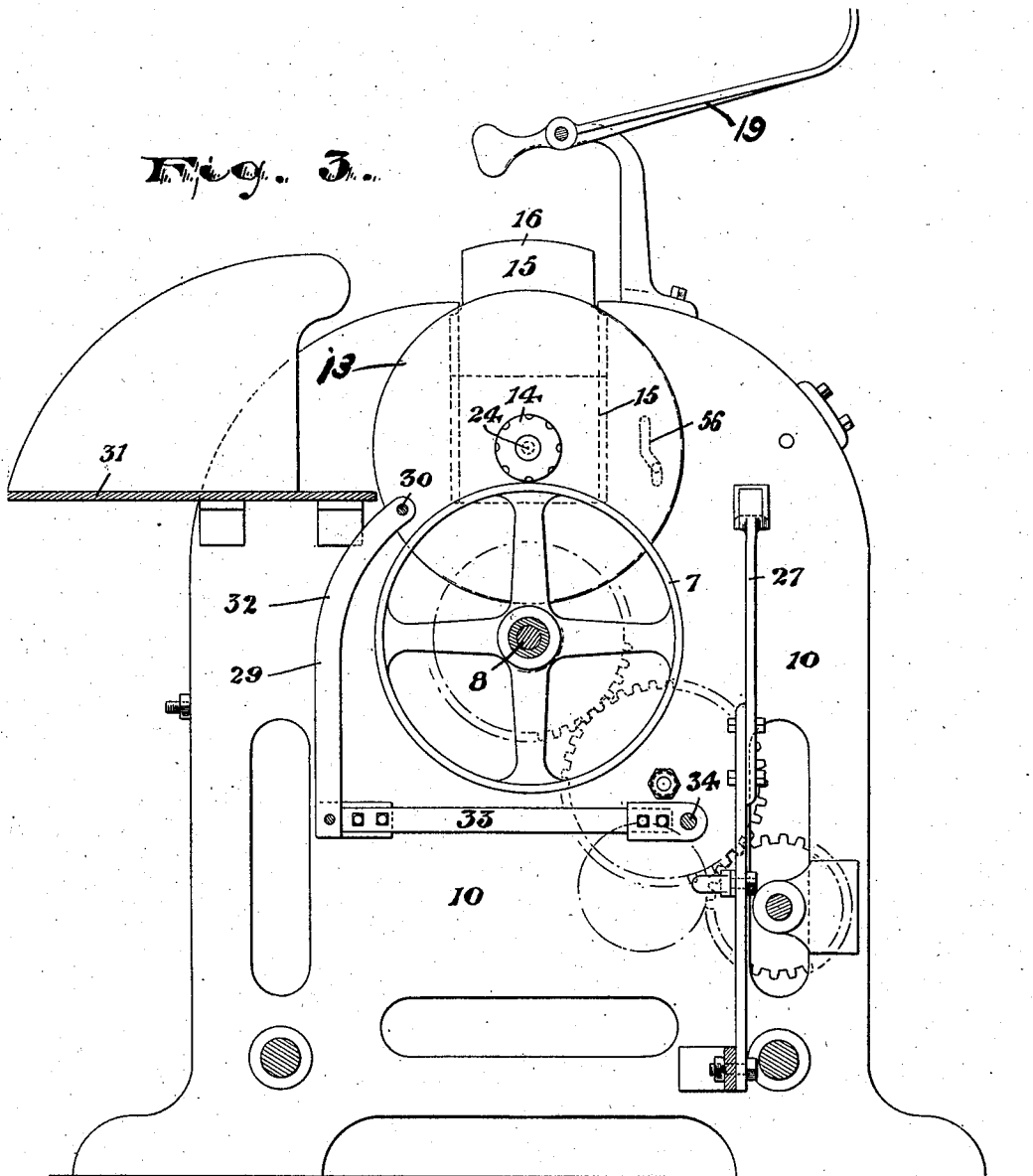
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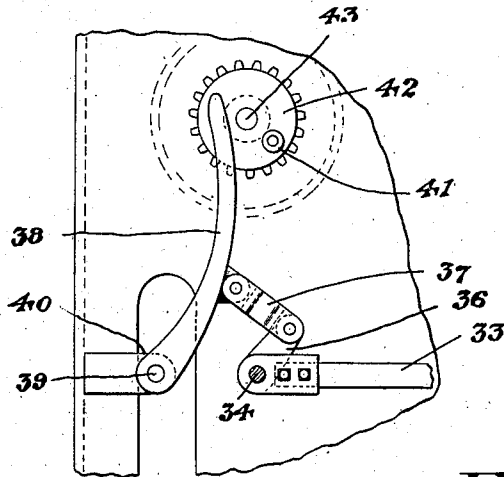


Fig. 4.

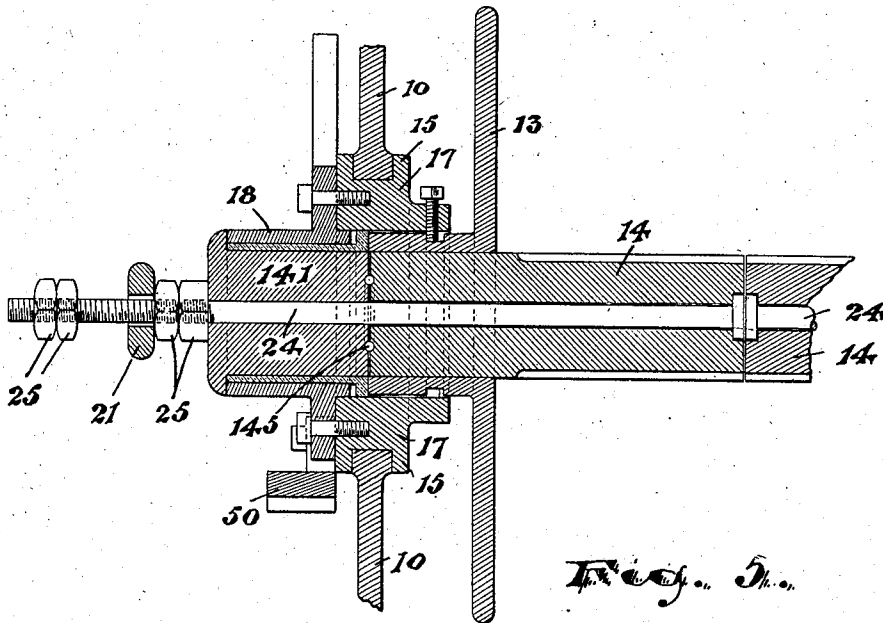


Fig. 5.

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UNITED STATES PATENT OFFICE.

GEORGE JAMES TORRANCE, OF HARRISON, NEW JERSEY.

AUTOMATIC WORSTED-BALLING MACHINE.

No. 827,332.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed November 16, 1905. Serial No. 287,891.

To all whom it may concern:

Be it known that I, GEORGE JAMES TORRANCE, a citizen of the United States, residing at Harrison, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Automatic Worsted-Balling Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of balling-machines represented by the one shown in my prior patent, No. 596,253, dated December 28, 1897, the balls wound by the machine therein illustrated and described being, however, particularly adapted for use in winding sliver on wooden spools.

The invention has for its objects the winding of worsted sliver into balls, and more particularly to automatically remove the ball of worsted sliver from the machine without stopping the machine or using the hands in breaking the said worsted sliver, it being understood that worsted sliver is ordinarily wound in balls or rolls without wooden spools, and hence a winding-machine adapted for service in winding balls with such spools will not serve in winding spoolless balls.

The invention consists in the improved balling-machine and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter described and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like figures of reference indicate corresponding parts in each of the several figures, Figure 1 is a side elevation of the improved device. Fig. 1½ is a detail in plan of a certain pawl-lever shown in Fig. 1. Fig. 2 is a back view of the improved machine. Fig. 3 is a section taken on line *x* of Fig. 2. Fig. 4 is a detail view showing certain features of a sliver-lifter; and Fig. 5 is a detail sectional view of a spindle and its bearings, taken horizontally at line *y* of Fig. 1.

In said drawings, 10 10 indicate side plates of the bed or frame, similar in general construction to those shown in my prior patent before referred to. 7 is a drum or wheel rotating between said side plates on a shaft 8, having a gear-wheel 9 at the outer side of one of said side plates, said gear-wheel 9 being in

train with gear-wheels 91 and 92, by which power is transmitted from the main driving-shaft 12. Arranged at the sides of the upper part of the drum 7 and extending considerably above said drum are the flanges 13 13, between which the sliver is wound into a ball, the flanges 13 serving to limit the lateral extension of the ball or control its width, as will be understood.

14 14 indicate the sections of a clamping-spindle between the inner ends of which the worsted sliver is caught and held, so that as the spindle revolves the sliver is wound on said spindle into the form of a roll or "ball," which ball is afterward unwound when the sliver is being fed to the comb or combing-machine. The spindle-sections 14 are arranged in central perforations in the flanges 13, as indicated in Fig. 5, and extend through passages provided therefor through the side plates 10 10 or in the slides 15, working vertically in said side plates. Said slides 15 may be in sections; the upper sections 16 serving as weights and the lower sections 17 providing bearings 18, Fig. 5, for the spindle-sections 14, which latter slide oppositely back and forth horizontally to and from clamping engagement with the sliver.

The longitudinally-reciprocating spindle-sections 14 14 or the sectional spool upon which the sliver is wound in the machine, but from which the "spoolless" ball is removed prior to its being thrown from the machine by the bat or bats 19, are given their reciprocating movements by means of cams 20 on the main shaft 8, and shifting-levers 21 are arranged at opposite sides of the machine on fulcrums 22 at or near the bottom of the side plates and at their upper ends having vertical slots 23, in which the spindle shafts or bolts 24 work as the spindles are raised and lowered, as hereinafter described. The cams give lateral movements to the upper slotted ends of the levers, and this movement is transmitted to the spindle studs, bolts, or shafts 24 by means of nuts and lock-nuts 25 on the outer threaded ends of said bolts or shafts 24, between which nuts the levers loosely lie, as indicated in Figs. 2 and 5. When the cams 20, acting on the arms 26 of the levers, throw said levers outward, the spindle-shafts 24 and spindle-sections 14 follow the said sections 14, thus separating and withdrawing from the ball of sliver to permit the said ball to be thrown out of the machine by the bat. The spindle-sections 14 14 are

themselves each in sections and loosely bolted together end to end, as shown in Fig. 5, each section being free to rotate on the bolt or shaft 24, on which it is arranged, and between the sections thereof are balls 145 to reduce friction of the parts. When the sectional spindle-sections are forced inward by the lever 21 into clamping relation with the sliver, the operating parts are timed to bring the spindles into frictional contact with the drum 7, as later described, the latter being preferably covered with leather and the spindle-sections being preferably longitudinally grooved on their peripheries to more positively receive movement due to such friction. The clamped sliver, which is broken after clamping from the ball next before wound, is caused to wind on the spindles, traversing back and forth the spindle from flange to flange 13, because of the action of the usual reciprocating sliver-guide 27. As the size of the ball increases diametrically the spindle-sections and their bearings are forced upward with the slides.

The means for operating the bats and sliver-guide are substantially such as is common to my earlier machines. To raise the sliver from the periphery of the drum preliminary to its being clamped between the ends of the spindles 14, as already described, I have provided a sliver-lifting frame 29, (shown more clearly than elsewhere in Fig. 3,) the lifting-bar 30 of which normally lies or is disposed at points between the chute 31 and the upper part of the periphery of the friction-drum 7. Said lifting-frame consists, preferably, of an upwardly-extending part 32, carrying said bar 30, and a horizontal extension 33, journaled on a bar 34, extending horizontally between the side plates, which bar 34 serves as a fulcrum to the frame. Said frame is provided at one side of the machine with an arm 36, Fig. 4, which is connected by a link 37 to a curved lever 38, having its fulcrum 39 on a bracket or extension 40 of one of the side plates. This lever in turn is engaged by an eccentric-roller 41, projecting from one side of a sprocket-wheel 42 on a shaft 43 in connection with the bat-operating mechanism. Said sprocket-wheel 42 is connected by a chain 44 with a second sprocket-wheel 45 on the bat-carrying shaft 46. As the sprocket-wheel 42 rotates the roller or projection 41 thereon is brought into contact with the curved arm 38, and the latter is caused to oscillate and lift the lever-like frame to engage and raise the sliver extending from the completely-wound ball lying between the flanges of the chute 31 across the friction-drum to the guide 27, so that said sliver will lie between the ends of the spindle-sections 14 14, and thus be caught by said spindle-sections and held tightly when said spindles are brought together. Upon

catching the raised sliver the abutting and rotating spindle-sections wind the same, and because the ball in the chute, held therein with some security by friction, is still connected with the sliver fed from the guide said sliver is stretched between the ball and spindle and is finally broken, the ball thus being severed completely from the fed sliver, and when the next ball is forced by the bats from between the chute-flanges the first ball lying in the chute is pushed from the said chute to a suitable receptacle. The bat sprocket-wheel 42 and shaft 43 are driven by gear-wheels 47 and 48, the latter being on the friction-drum shaft 8. The gear-wheels 47 and 48 are in pairs, one pair of wheels being on each side of the machine. The wheels 47 rotate in connection with cams 49 on the same shaft therewith, said cams 49 serving a purpose now to be described. When the ball of sliver is of proper size to be removed from the winding means and ready to be thrust between the spindle-sections and flanges 13 into the chute 31 by the bat 19, to relieve such ball from the friction of the drum, and thus to facilitate its exit passage, I have provided means for lifting the spindles and ball thereon away from the said drum a half-inch, more or less. To this end I have attached a vertically-disposed toothed rack 50 to the slide-sections 17, carrying the bearings for the said spindles at opposite sides of the machine. Adjacent to the racks are disposed pawl-levers 51, fulcrumed on the side plates or bracket attachments thereof at one end and at the opposite end having a sliding pawl-tooth carrier 52. Intermediate of its ends each lever 51 is provided with a stud 53, with a roller 54 thereon, which is engaged by the cam projection 55 of one of the cams 49. As the cam rotates the projection 55, engaging the lever 51, raises said lever and its sliding pawl-tooth carrier, which latter is then directed, by means of a crooked slot 56 and a pintle or finger 57 on the sliding carrier, toward the rack 50, the pawl-tooth 58, Fig. 1, finally engaging a tooth of the rack and lifting said rack and its connections to accomplish the results before outlined. On the passage of the cam projection 55 from the roller 54 the lever 51 is permitted to drop away from the rack and the latter to drop to bring the spindles again into frictional contact with the drum.

Having thus described the invention, what I claim as new is—

1. In a balling-machine, the combination with the side plates and slides and a friction-drum, of a sectional spindle on which to wind the sliver, the sections of said spindle being adapted to abut endwise against one another to clamp the sliver between, means for lifting the sliver to a point between the abutting ends of said sections, and means for moving

the sections to and from one another and means for rotating the drum, substantially as set forth.

2. In a balling-machine, the combination
5 with the side plates, slides working in said side plates, a spindle, a friction-drum adapted to impart rotary motion to the spindle, means for operating said drum, a bat and means for oscillating said bat to throw the
10 ball out from the machine and a guide for the sliver, of said spindle arranged in said slides, one section lying in each slide, means for moving said sections longitudinally to and from one another, and means for inserting
15 the sliver between the sections when said sections are parted one from the other, substantially as set forth.

3. In a balling-machine, the combination with the side plates, slides working in said
20 side plates, a sectional spindle, a friction-drum adapted to impart rotary motion to the sectional spindle, means for operating said drum, a bat and means for oscillating said bat and a guide for the sliver, of said sectional
25 spindle, each section of which, comprises a shaft and sections arranged on said shaft, one section being free to rotate on said shaft independent of the other section, substantially as set forth.

30 4. In a balling-machine, the combination with the side plates and chute, a spindle, slides for the spindle, and a drum for rotating the spindle, said spindle arranged in said
35 slides and movable from the drum therewith and said spindle being in separable sections and having means in connection therewith for withdrawing said sections from the ball, of a lifting-frame having a bar adapted to pass
40 between the spindle and chute to raise the sliver to a point between the ends of the spindle-sections, and means for operating said frame, substantially as set forth.

5. In a balling-machine, the combination

with the side plates and chute, a spindle, slides for the spindle, and a drum for rotating
45 the spindle, said spindle, arranged in said slides and movable from the drum therewith and said spindle being in separable sections and having means in connection therewith
50 of a lifting-frame having a bar adapted to pass between the spindle and chute to raise the sliver to a point between the ends of the spindle-sections, said bar being attached to an upwardly-extending part of said frame
55 and said frame comprising said upwardly-extending part and a horizontal part fulcrumed on bearings in connection with the side plates, and means for turning the frame on its fulcrum to raise the lifting-bar, substantially as
60 set forth.

6. In a balling-machine, the combination with the side plates and chute, a spindle, slides
65 for the spindle, and a drum for rotating the spindle, said spindle arranged in said slides and movable from the drum therewith and said spindle being in separable sections and having means in connection therewith for
70 withdrawing said sections from the ball, of a lifting-frame having a bar adapted to pass between the spindle and chute to raise the sliver to a point between the ends of the spindle-sections, said frame comprising an upwardly-extending part carrying said bar, a
75 horizontally-extending part fulcrumed to the side plates and having an arm linked to a lever fulcrumed on one of said side plates and means for operating said lever, substantially as set forth.

In testimony that I claim the foregoing I
80 have hereunto set my hand this 13th day of November, 1905.

GEORGE JAMES TORRANCE.

Witnesses:

CHARLES H. PELL,
ETHELWYN PELL.