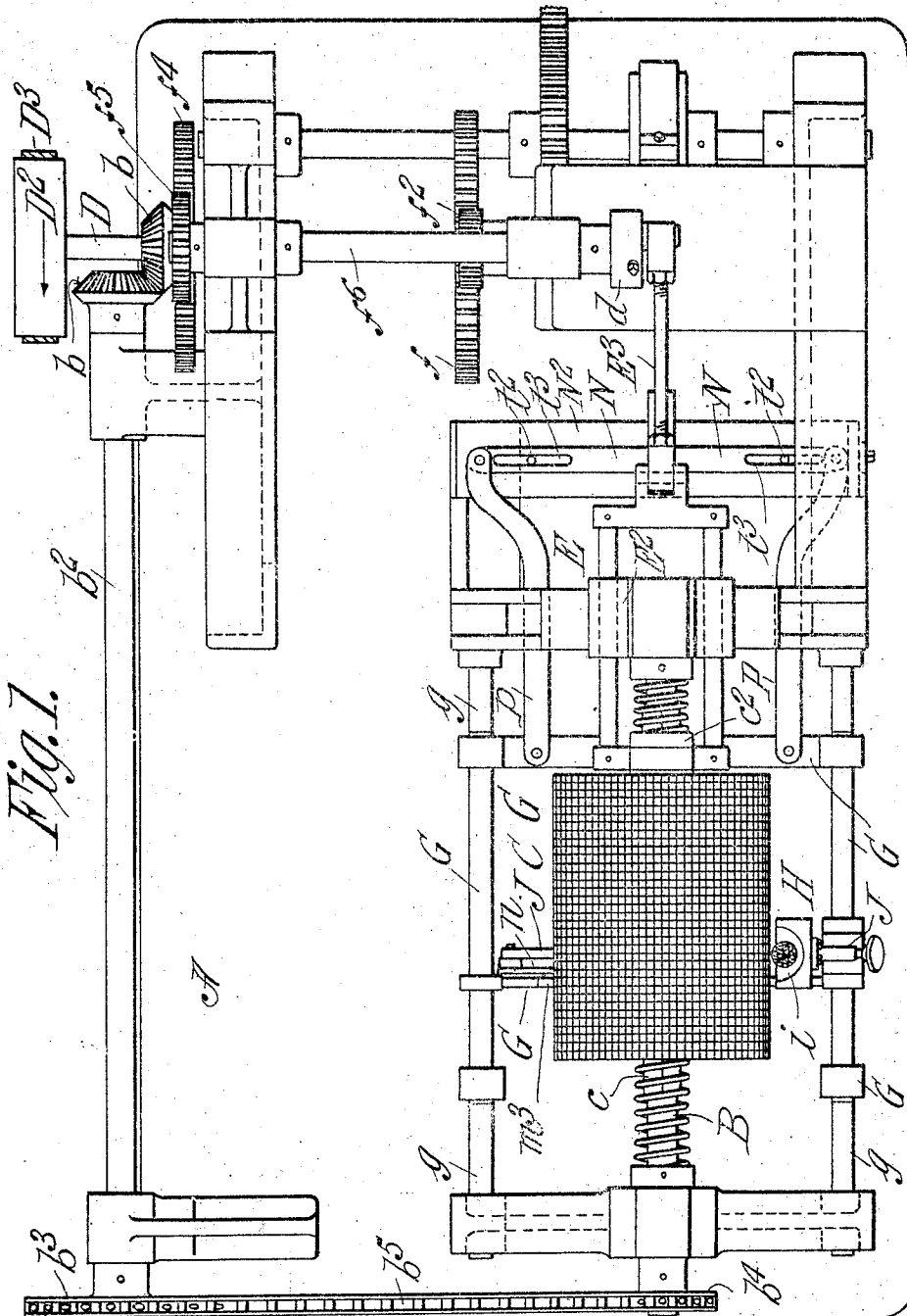


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4 SHEETS—SHEET 1.

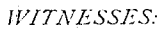


A. L. Sprague
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1,047,678.

4 SHEETS—SHEET 2.



H. L. Sprague
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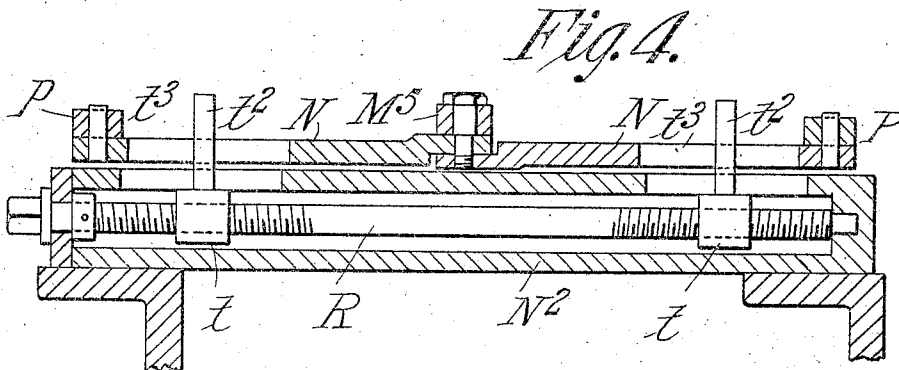
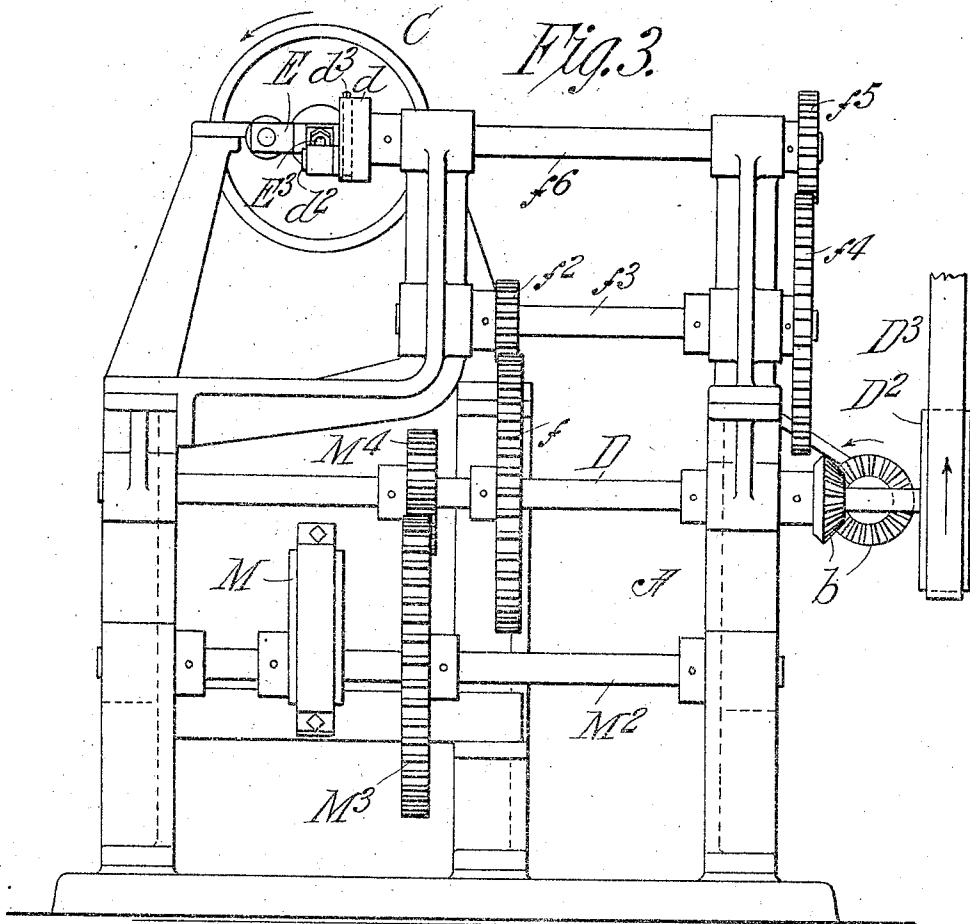
Emil A. Miller,
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MACHINE FOR WINDING BASE BALLS.
APPLICATION FILED JAN. 2, 1912.

1,047,678.

Patented Dec. 17, 1912.

4 SHEETS—SHEET 3.



WITNESSES:

H. L. Sprague
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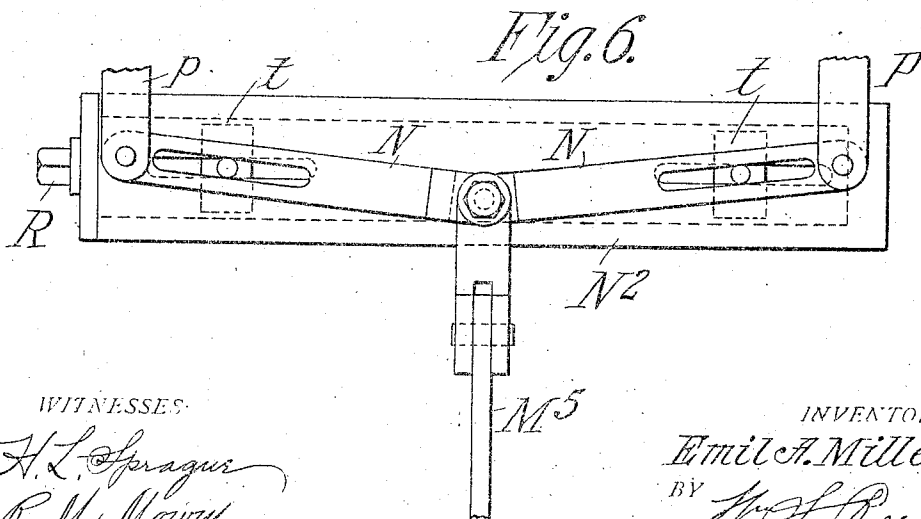
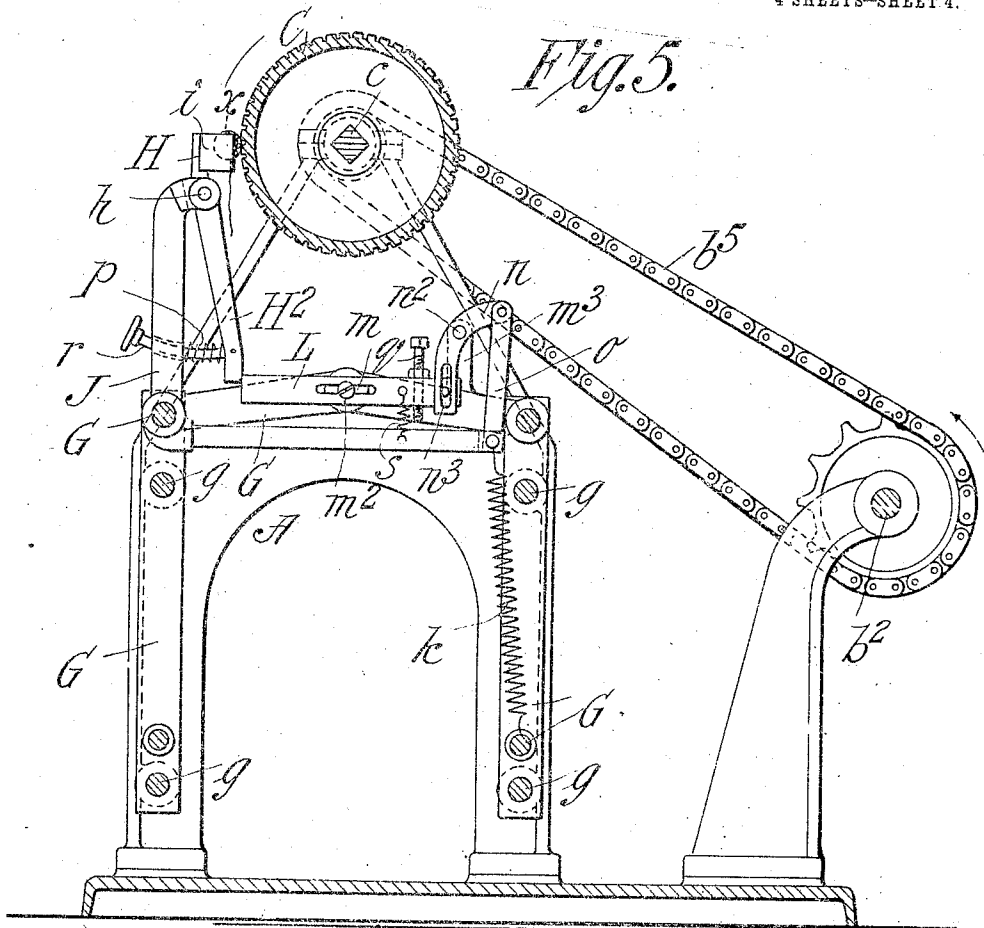
H. J. Bellows,
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E. A. MILLER.
MACHINE FOR WINDING BASE BALLS.
APPLICATION FILED JAN. 2, 1912.

1,047,678.

Patented Dec. 17, 1912.

4 SHEETS—SHEET 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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MACHINE FOR WINDING BASE-BALLS.

1,047,678.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed January 2, 1912. Serial No. 668,841.

To all whom it may concern:

Be it known that I, EMIL A. MILLER, a German subject, and resident of Chicopee Falls, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Machines for Winding Base-Balls, of which the following is a full, clear, and exact description.

This invention relates to an improved machine, for the winding of string, yarn or the like about a core most especially for the production of the body of a base ball.

In the present machine is comprised a rotatable drum coöperative with which is a ball holder mounted to have a yielding or receding movement relatively to the drum to accommodate itself to the enlargement of the ball while being made, and which ball holder has a movement back and forth parallel with the axis of the drum so that the ball being wound in the holder will have a rolling movement for the imparting thereto of its spherical shape.

The machine, furthermore, comprises means whereby not only the drum is axially reciprocated, in addition to its rotatable movement, and the ball holder reciprocatingly moved relatively to the drum, but also whereby the limits of the reciprocating movements of the drum and ball holder may be separately varied and regulated.

The machine, furthermore, comprises means whereby when the ball has become wound to a given size the ball holder will be automatically thrown to a position away from the periphery of the drum to result in a termination of the ball winding action. And in connection with the last mentioned automatic means, a device is provided whereby, as predetermined, the automatic withdrawal of the ball holder from its working proximity to the drum will take place either when the ball is made up to a comparatively small or to a large diameter; and other objects of the invention are attained in and by the organization of the machine as will be hereinafter rendered apparent.

The invention is described in conjunction with the accompanying drawings and is set forth in the claims.

In the drawings:—Figure 1 is a plan view of the ball winding machine. Fig. 2 is a front elevation of the same. Fig. 3 is a right hand end elevation of the machine. Fig. 4 is a vertical section on a larger scale of a part of the machine taken on line 4—4, Fig.

2. Fig. 5 is a sectional elevation as seen beyond the plane indicated by line 5—5, Fig. 2. Fig. 6 is a plan view of the part of the portion of the machine which in Fig. 4 is shown in vertical section.

In the drawings, A represents the supporting structure or machine frame of suitable design, of which *a a* are supporting uprights for a shaft B on which the axially horizontal drum C is mounted.

D represents the driving shaft of the machine,—D² and D³ representing the pulley and driving belt therefor.

Rotary motion is imparted to the drum carrying shaft G through means of bevel gears *b b*, shaft *b*², sprocket wheels *b*³ and *b*⁴, and sprocket chain *b*⁵. A portion of the drum carrying shaft G intermediate between the uprights *a* (which portion is indicated by *c* in Figs. 1, 2 and 5) is of square,—or equivalent,—form; and the drum C which is preferably made hollow and with opposite end heads, has centrally in such end heads square apertures whereby the drum while capable of sliding motion axially relatively to the shaft is constrained to rotate in unison with the shaft. The drum is peripherally scored or roughened to increase its efficiency in the ball winding action.

Reciprocatory movement of the drum on the shaft B by which it is rotatably carried is imparted by means as follows: The driving shaft D has a gear wheel *f* thereon which meshes into a gear wheel *f*² on an idler shaft *f*³, which latter shaft also has gear wheel *f*⁴ thereon in mesh with gear wheel, or pinion, *f*⁵, on a countershaft *f*⁶. The shaft *f*⁶ has a face plate *z* on its end, which is equipped with a crank pin *z*² to which a radial adjustment may be given through means of the screw *z*³ in a well known manner. The yoke frame E slidably guided through supporting ways E² therefor has connection with the extended hub *c*² at one end of the drum C; and the pitman rod E³ connects the crank pin *z*² and the yoke frame E. As manifest, according to the radial adjustment of the crank pin the range of back and forth movement of the drum C may be correspondingly more or less. The portion of the frame below where the drum C has its location is made with parallel horizontal runner bars *g g* in front and rear pairs on which a frame G is mounted for sliding movement parallel with the axis of the drum. The means for imparting

reciprocatory motion to this frame,—which is the ball holder carrying frame will be hereinafter pointed out.

H represents the ball holder, and J represents an angular lever on the inturned extremity of the upstanding arm of which the ball holder is fulcrumed on the pivot h . The ball holder proper, the location of which is above its pivoted connection with the upstanding arm of the angle lever J consists of a head or block having a recess therein which is open both to the top and to the rear side of the head and the wall i of such recess having the conformation of approximately a quarter of a sphere, the diameter of which is as great, or slightly greater than that of the completely wound ball bodies to be produced in the machine by winding. The ball holder has a depending member or extension H^2 to the rear of and more or less separated from the upstanding end of the angle lever. The angle lever J at its elbow is fulcrumed on the front upper bar of the carrier frame G; and the lower arm thereof extends substantially horizontal for a considerable distance rearwardly. The spring k has one end thereof attached to the extremity of the lower arm of the angular lever and its other to the carrier frame G and is operative for the exertion of the force to swing the angle lever and the ball carrying head yieldingly toward the drum C.

L (see Fig. 5 especially), represents a latch for the ball holder which is made in the form of a straight bar having a slot longitudinally along its middle portion through which slotted portion it is by the stud m^2 fulcrumed on a transverse member of the carrier frame G above horizontal arm of the lever J. This latch lever is arranged for engagement with the lower end portion of the depending member H^2 of the ball holder; and it is capable by reason of its stud and slot form of support of an endwise sliding as well as a rocking movement.

On and adjacent the upstanding bracket m^3 of the carrier frame a curved lever n is fulcrumed by the pivot n^2 ,—the link o connecting one arm of this curved lever to the rear extremity of the angle lever while the lower arm of the curved lever n has a stud and slot engagement indicated at n^3 with the latch bar L so that under the swinging of the curved lever n by reason of its articulation with the angle lever J, the latch bar will have an endwise movement for accommodation to or correspondence with the swinging movement which the ball carrier has in its recedence forwardly from the drum as in the winding operation the ball becomes enlarged; and yet the engagement between the curved lever n and latch bar L is such that the independent rocking movement of the latch will be permitted.

The rearwardly extending arm of the

angular lever is more or less nearly directly under the latch bar; and there is an abutment provided on the one and for coöperation with the other of the last named parts so that under a swinging of the angle lever in sufficient extent, the latch bar will be swung far enough to move out of engagement with the depending extension H^2 of the ball holder, leaving the latter free to be swung, because of the reaction of the spring p forwardly away from the drum to result automatically in the termination of the ball winding operation. As shown, the abutment consists of a screw q vertically positioned and threading through the rear arm of the latch lever; and it is, of course, susceptible of vertical adjustment for a greater or less degree of lost motion between the angle lever and the latch lever.

On the reciprocation of the carrier frame G^2 horizontally parallel with the axis of the drum, means are provided as follows: M represents an eccentric on a countershaft M^2 , which by the gears M^3 and M^4 is driven on the driving shaft. The eccentric strap continued in the eccentric rod M^5 has connection with the adjacent arm of a pair of levers N N' which are supported on a hollow cross girder N^2 of the machine frame. The opposite and outer extremities of the levers N N' are by the links P P connected with the carrier frame G,—such being a balanced form of connection for the imparting of an equable reciprocatory movement to the frame.

The range of the reciprocatory movement may be increased or shortened as may be demanded for the best and most satisfactory winding operation of the machine by the provisions as follows: A pair of blocks t t are fitted in the hollow or box like girder N^2 provided with studs t^2 upstanding therefrom and projecting through apertures in the top of the box and also in engagement through longitudinal slots t^3 in the levers N N'. The blocks t are slidably adjustable and the upstanding studs carried thereby make adjustable fulcrums for the levers whereby the throw of the arms thereof which are linked to the carrier frame G may be varied. The sliding adjustments of the blocks t t is effected by the turning of the right and left screw threaded shaft R, which shaft is journaled for rotation in the supporting part N^2 therefor but restrained, as will be clearly perceived in Fig. 4, from having any endwise motion,—the right and left hand threads of such shaft screw engaging through the box.

The string or yarn being engaged with the spherical core x placed in the ball holder and the machine started with the parts set as represented in Fig. 5, as the winding progresses and the ball becomes enlarged, the ball holder will be forced gradually for-

wardly correspondingly swinging the angle lever J on which it is pivoted and latched by the bar L. The spring *k* keeps the angle lever and ball carrier up to their working proximity to the drum. As the ball holder and upper arm of the angle lever gradually move forwardly, the depending extension H² of the holder has a rearward swinging movement for the accommodation of which the latch lever is caused, through the means hereinabove fully described, to creep rearwardly. After the ball has become more or less wound, the upwardly swinging rear arm of the angle lever engages the abutment *g* and rocks the latch lever until the same finally, as predetermined by the adjustment of the abutment *g*, disengages from the ball holder extension so that the holder H is swung forwardly on, and independently of, the angle lever, and ceases to impart a pressure to keep the ball in engagement with the drum. The spring *p* between the member H² and the upstanding arm of the angle lever, encircles the slightly curved handle provided rod *r*, a portion of which passes through an aperture therefor in the angle lever arm. This handle rod is convenient for the resetting and relatching of the devices,—it being here noted that on the forward drive of the push rod *r* so that the extremity of member H² is forward of the proximate end of the latch bar L, the latter by its spring *s* will be automatically snapped to engagement.

Under the rotative and also the reciprocatory movement of the drum, the ball being wound is rolled not only on an axis parallel to that of the drum but on other axes variably angular thereto; and the reciprocation additionally of the ball holder parallel with the axis of the drum increases and renders more universal the rollings of the ball for its most perfect spherical completion, especially as will be appreciated in view of the fact that the reciprocatory movements of the drum and of the pawl carrier are not usually concurrent, are not at the same speed, and are not in the same extents.

I claim:—

1. The combination with a rotatable drum, of a lever, a ball-holder pivotally mounted on an arm of the lever, and in proximity to the drum, a spring reacting against the lever for swinging the holder-carrying arm thereof toward the drum, a latch bar intermediately fulcrumed and also slidable with which the depending member of the holder has an engagement, said angular lever being arranged for coöperation with the latch bar whereby under the swinging movement of the lever a swinging movement will be imparted to the latch bar for its disengagement with the ball holder, means actuated by the lever for sliding the latch bar in conjunction with the swinging movement of

such lever, and means for exerting a yielding pressure against the ball holder in a direction for forcing it away from the drum.

2. In a machine of the character described, the combination with a rotatable and axially reciprocatory drum, of a lever, and a ball-holder pivotally mounted on an arm of the lever, and in proximity to the drum, a spring reacting against the lever for swinging the holder carrying arm thereof toward the drum, a latch bar intermediately fulcrumed and also longitudinally slidable with which the depending member of the holder has an engagement, said angular lever being arranged for coöperation with the latch bar whereby under the swinging movement of the lever a swinging movement will be imparted to the latch bar for its disengagement with the ball holder, a pivotally mounted lever linked to the angular lever and having a draft engagement with the latch bar, and means for exerting a yielding pressure against the ball holder in a direction for forcing it away from the drum.

3. In a machine of the character described, in combination, a rotatable and axially reciprocatory drum, a lever, a ball-holder pivotally mounted on an arm of the lever, and in proximity to the drum, a spring reacting against the lever for swinging the holder carrying arm thereof toward the drum, a fulcrumed latch with which the depending member of the holder has an engagement, said angular lever being arranged for coöperation with the latch bar whereby under the swinging movement of the lever it will have a lost motion engagement with and so that a swinging movement will be imparted to the latch bar for its disengagement with the ball holder, means for varying the lost motion between the engaging lever and latch bar, and means for exerting a yielding pressure against the ball holder in a direction for forcing it away from the drum.

4. In a machine of the character described, in combination, a rotatable drum, an angular lever having an upstanding and a horizontal extending arm, a ball holder adjacent and coöperative with the drum pivotally mounted on the upstanding arm of the lever and having a depending lever-like member, a spring reacting for swinging the ball holder in a direction away from the drum, a spring for swinging the angular lever to force its upstanding arm toward the drum, a latch bar intermediately fulcrumed and constrained for an endwise movement, located above the horizontal arm of the angular lever, provided with an adjustable abutment stud, another lever intermediately pivotally mounted and having an engagement with the latch bar and a link connecting the last named lever with the horizontal arm of the angular lever.

5. In a machine of the character described, 130

in combination, an axially horizontal rotatable drum, a frame slidably mounted for movement parallel with the axis of the drum and means for imparting a reciprocatory movement thereto, a lever pivotally mounted on and bodily movable with said frame, a ball holder pivotally mounted on an arm of the lever and having its location in cooperative proximity to said arm, a spring reacting against the lever for swinging the holder carrying arm thereof toward the drum, a fulcrumed latch with which the holder has an engagement, said lever being arranged for cooperation with the latch so that under the swinging movement of the lever a swinging movement will be imparted to the latch, and a spring for exerting a pressure against the ball holder to move it in a direction away from the drum.

6. In a ball winding machine, in combination, a supporting frame having a shaft horizontally mounted thereon and means for rotating said shaft, a drum mounted on said shaft and slidable endwise relatively thereto, but constrained for rotation in unison with the shaft, a frame slidably mounted on the supporting frame for movements parallel with the axis of the drum, a ball holder carried by said slidable frame and yieldingly cooperative with the drum, a yoke frame slidably supported on the machine frame and having connection with the drum, means for imparting reciprocatory movement to the slide yoke, and means for imparting reciprocatory movement to the ball holder carrying slide frame.

7. In a ball winding machine, a winding drum, means for rotating the drum on a fixed axis and at the same time moving it endwise, an arm, a head on the arm having a cavity for supporting the ball to be wound to project beyond the cavity in the head, the arm being supported to swing to and from the drum, and also bodily movable parallel

to the axis of the drum, and means for imparting dissimilar movements to the drum and arm each in both said directions.

8. In a ball winding machine, a winding drum, a lever pivoted on the machine, an arm pivoted on the lever, a ball holder fast on the arm, a latch bar pivoted on the machine and engaging the arm whereby the movement imparted to the holder by the ball as wound will cause the arm to swing the lever, a spring engaging the lever to cause it to press the arm and holder toward the drum, means for causing the swinging of the lever, by the holder and arm to swing the latch bar to disengage the arm therefrom, the latch bar being endwise movable on its pivot, and means for imparting endwise movement to the latch bar from the said swinging of the lever by the holder and arm.

9. In a ball winding machine, a winding drum, a bent lever pivoted on the machine, an arm pivoted on the lever, a ball holder fast on the arm on one side of its pivot, a swinging latch bar having its extremity arranged to be engaged by the said arm, a spring connected with the bent lever to swing it to advance the arm and press the holder against the drum and also to press the arm against the end of the latch bar, and means for causing the swinging of the lever by the holder and arm to swing the latch bar and shift its extremity beyond the arm to free the holder, the latch bar being also endwise movable, and means connected with the bent lever for imparting a slow endwise advance of the latch bar as the lever is swung by the ball being wound.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

EMIL A. MILLER.

Witnesses:

G. R. DRISCOLL,
E. E. ERICSON.