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AUTOMATIC WINDING MEANS FOR CARD MACHINES.

APPLICATION FILED AUG. 5, 1909.

966,351. Patented Aug. 2, 1910.

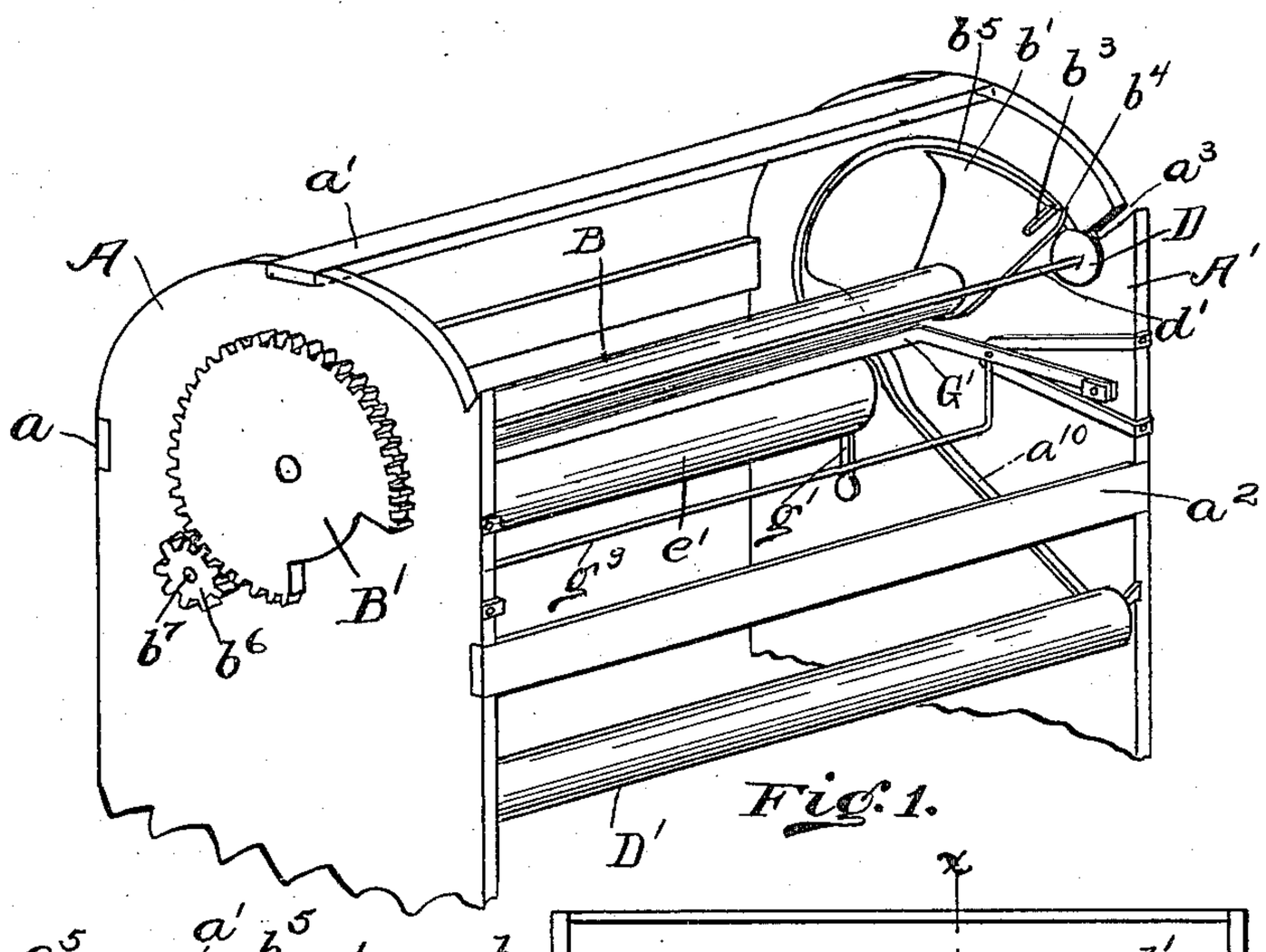

Fig. 1.

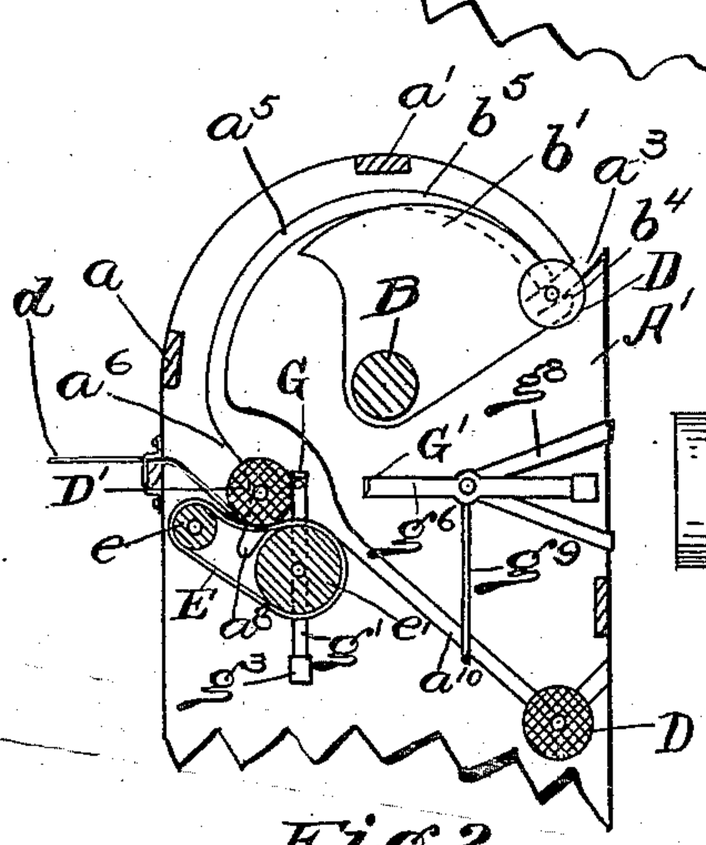

Fig. 2.

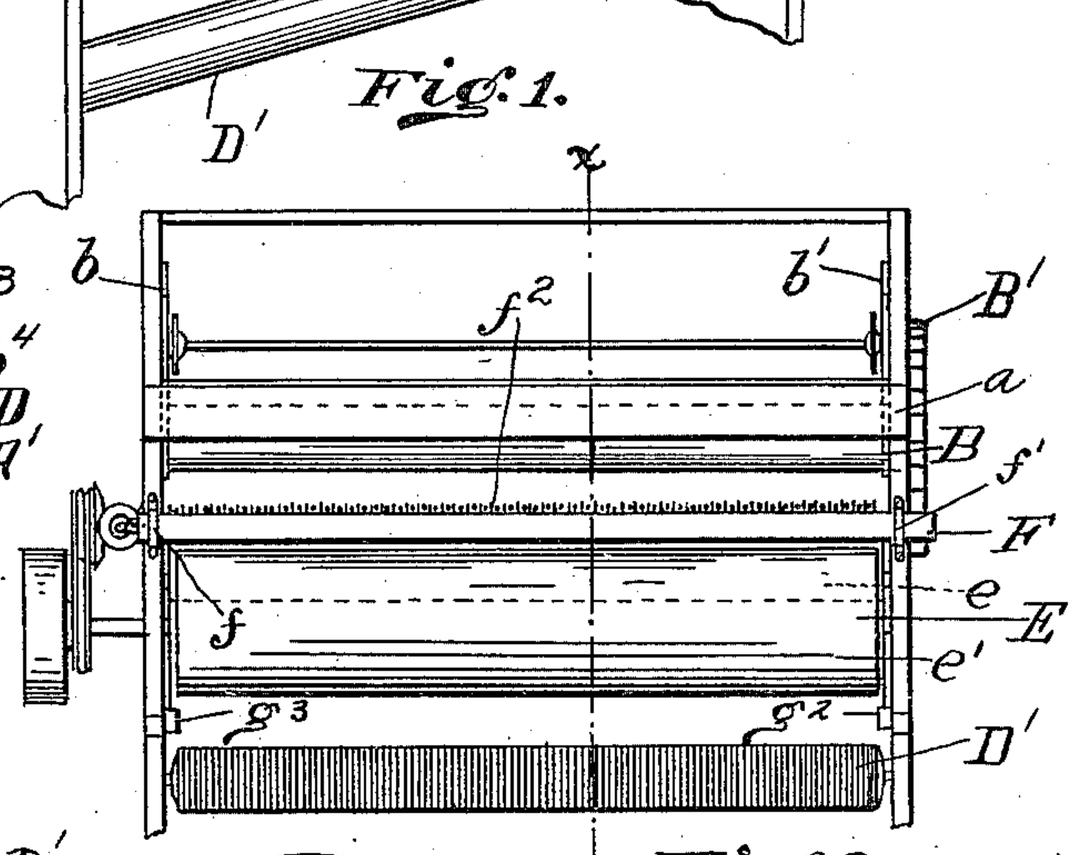

Fig. 3.

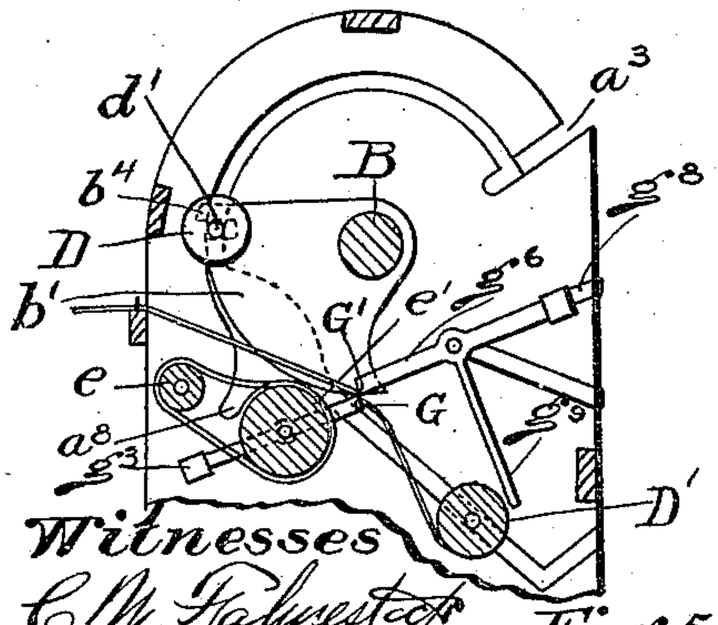

Fig. 5

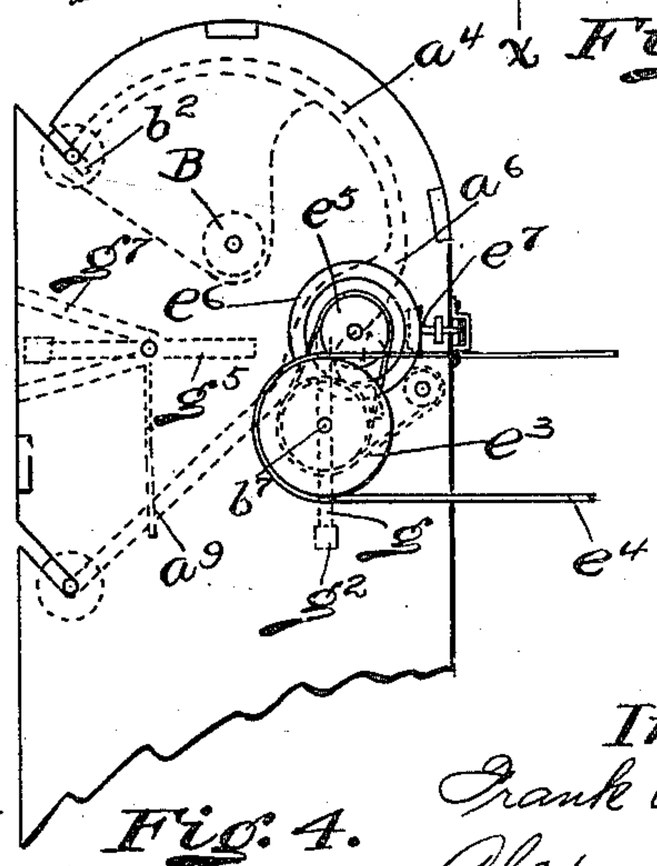

Fig. 4.

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AUTOMATIC WINDING MEANS FOR CARD-MACHINES.

966,351. Specification of Letters Patent. Patented Aug. 2, 1910.

Application filed August 5, 1909. Serial No. 511,272.

To all whom it may concern:

Be it known that we, FRANK A. NORTHCUTT and ALEXANDER NORTHCUTT, citizens of the United States of America, and residents of Newport, county of Campbell, and State of Kentucky, have invented certain new and useful Improvements in Automatic Winding Means for Card-Machines, of which the following is a specification.

The object of our invention is a machine which automatically feeds the empty spools to the winding mechanism, winds the strands of material upon the spool, discharges the filled spool, feeds an empty spool into place, and cuts the ends of the strands of yarn from the filled spool preparatory to their being wound upon the fresh spool. This object is attained by the means described in the specification and illustrated in the accompanying drawings, in which,

Figure 1 is a perspective view of the machine embodying our invention. Fig. 2 is a sectional view taken upon line x—x of Fig. 3. Fig. 3 is a front elevation. Fig. 4 is a side elevation taken from the left hand side of Fig. 3. Fig. 5 is a detail view of the knives in the position they occupy when severing the yarn.

Referring to the parts, the sides, A, A′, of the machine are braced by cross rods, a, a', a^2. Between the sides, A, A′, a carrier shaft, B, is journaled. Shaft, B, has secured to it adjacent to the inner faces of the sides, A, A′, plates, b, b', which have notches, b^2, b^3, cut into them, which are adapted to engage the ends of the lowermost of the empty spools, D, which rest in the inclined feed-ways, or grooves, a^3, formed in the inner faces of the sides, A, A′. Adjacent to the notches, b^2, b^3, plates, b, b', have fingers, b^4, which project out beyond the periphery, b^5. Journaled between the sides, A, A′, are rolls, e, e', over which passes a broad, endless belt, E, to which a continuous rotation is imparted in order to rotate the spools which are fed upon it by the carrier. The sides, A, A′, have upon their inner faces curved grooves or ways, a^4, a^5, which lead from the feed way, a^3, to a point, a^6, adjacent to the belt, or apron, E. From the point, a^6, short journal grooves or off-sets, a^8, are formed, and from the point, a^6, downwardly inclined discharge slots, a^9, a^{10}, lead to the rear of the machine.

In alinement with the roller, e, a vibrator-bar, F, is mounted in brackets, f, f', upon the front of the sides, A, A′. Bar, F, has upwardly projecting pins, f^2, between which the strands of yarn are led to the spool. The vibrator-bar gives a slight vibration to each strand of yarn to insure that in winding it is distributed over a certain expanse of the spool, in order to insure an even winding of the yarn. Upon the shaft of the roll, e', arms, g, g', are journaled. Arms, g, g', carry at their upper ends a knife blade, G, adjacent and parallel to roll, e', and at their lower ends have weights, g^2, g^3. The knife, G′, which coöperates with knife, G, is secured upon the end of arms, g^5, g^6, which are pivoted upon brackets, g^7, g^8, which are secured to the sides, A, A′. Arms, g^5, g^6, have projecting down from them a bent arm, g^9, which stands normally adjacent to the inclined discharge slots, a^9, a^{10}.

We will now describe the means of imparting motion to the various parts of the machine and will then describe the operation of the device. Shaft, B, has upon its outer end a mutilated gear wheel, B′, which intermeshes with a gear wheel, b^6, upon a driven shaft, b^7. The rotation of the shaft, B, is so timed that it makes one rotation during the time which it takes to completely fill a bobbin. The mutilated part of the gear, B′, is placed in a position such that it comes to the gear, b^6, just as the blades, b, b', carrying an empty spool approach the notches, a^8, in order that the discharge of the spool into the notches may be done quickly, for reasons hereafter described. Roll, e', carries a pulley, e^3, upon its outer end, which is engaged by a driving belt, e^4. Roll, e, carries upon its end a pulley, e^5, which is coupled to the roller, e', by means of a belt, as shown in Fig. 4. Roll, e, likewise carries a bevel pinion, e^6, which imparts rotation to a shaft, e^7, which vibrates the bar, F.

The operation of the machine is as follows: Suppose the parts to be in the relative position shown in Fig. 2, it is seen that the periphery, b^5, of the plates, b, b', have passed the shaft of the spool, D, without engaging it, but that the finger, b^4, is engaging the shaft of the spool. The rotation of the plates, by reason of the rotation of the shaft, B, will then carry the empty spool, D, along the way, a^5, toward the belt, E. Meanwhile the spool, D′, upon which the yarn is being fed, by reason of increased diameter of the filled spool over that of the empty, is raised

into the path of the front edge of the plates, b, b', so that the front edges of the plates, b, b', engage the filled spool and carry it toward the discharge slots, a^9, a^{10}. In so doing, the filled spool, D′, comes into contact with the arms, g, g', of the blade, G, and causes the arms, g, g', to be rotated about their pivot points so as to carry blade, G, below the blade, G′, and to carry likewise the strands of the yarn, d, below the knife, G′. When the filled spool, D, is discharged into the inclined slots, a^9, a^{10}, it strikes the arm, g^9, and causes it to carry the blade, G′, into the path of the knife, G, which is returning to its normal position after the filled spool, D′, has released the arms, g, g'. The knives in passing each other, sever the strands. In the meantime the plates, b, b', have deposited an empty spool upon the apron, E, and upon top of the severed strands, which are then carried by the apron and by the rotation of the spool, around the fresh spool. The movement of the shaft, B, is made rapidly at the point of depositing the fresh spool upon the strands in order that the fresh strands may be wound upon the spool at the moment they are severed from the preceding spool. The fresh spool is filled while the shaft, B, and the plates, b, b', are completing another revolution. The shafts, d', of the spools, D, preferably have a felt covering, in order to cause the strands of yarn more readily to be taken up by the spools.

What we claim is:

1. In an apparatus of the character described, the combination of a spool winding device, a rotating carrier for engaging and discharging filled spools from said device, provided with fingers for delivering an empty spool to said device, means for continuously rotating said device and means for rotating said carrier.

2. In a device of the character described the combination of a spool winding device, a rotating carrier adapted to contact a filled spool to discharge it from the winding device and to deposit an empty spool upon the winding device after discharging the filled spool therefrom, means for rotating said winding device and means for rotating said carrier.

3. In a device of the character described the combination of a spool winding device, a means of discharging a filled spool from the winding device, knives located adjacent to the winding device and adapted to be actuated by the discharged spool to sever the incoming yarn from the filled spool and means for driving the winding device.

4. In a device of the character described the combination with the sides thereof which are provided with feed grooves for receiving empty spools, a winding device located between the sides, curved ways in the sides leading from the feed way to the winding device, discharge ways upon the sides leading from the winding device, a rotating shaft journaled in the sides and having carrier plates secured upon it adjacent to the sides and adapted to engage the empty spools and carry them along the curved ways to the winding device and to engage the filled spools and carry them into the discharge ways and means for driving the winding device.

5. In an apparatus of the character described, a spool winding device, a carrier for delivering empty spools to and discharging filled spools from said device, coöperating knives actuated by the discharged spool for severing the incoming yarn from the discharged spool, means for driving said winding device and means for operating said carrier.

6. In an apparatus of the character described, a spool winding device, a carrier for delivering empty spools to and discharging filled spools from said device, and coöperating knives successively actuated by the discharged spool to sever the incoming yarn from the discharged spool, means for driving said winding device and means for operating said carrier.

7. In an apparatus of the character described, a spool winding device, a rotatable carrier for delivering the empty spool to and discharging a filled spool from said device, driving agents for said carrier provided with means for varying the speed of rotation of said carrier and means for rotating said winding device.

8. In an apparatus of the character described, a spool winding device, a rotatable carrier for delivering empty spools to and discharging filled spools from said device, driving means for said carrier provided with means for causing said carrier to accelerate in speed subsequent to the time of discharging a filled spool and prior to the delivering of an empty spool to said device and means for driving said winding device.

9. In an apparatus of the character described, a winding device comprising coöperating pulleys and a belt adapted to receive the spool to be wound, feed grooves in the sides of the apparatus for receiving empty spools, curved ways formed in said sides leading from the feed grooves to the winding device, discharge ways leading from the winding device, a rotatable carrier for conveying empty spools to and discharging filled spools from said device, means for driving said pulleys and means for driving said carrier.

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