

Dec. 13, 1966

J. H. NYDAM

3,290,857

BOBBIN LOADING APPARATUS

Filed Oct. 4, 1963

7 Sheets-Sheet 1

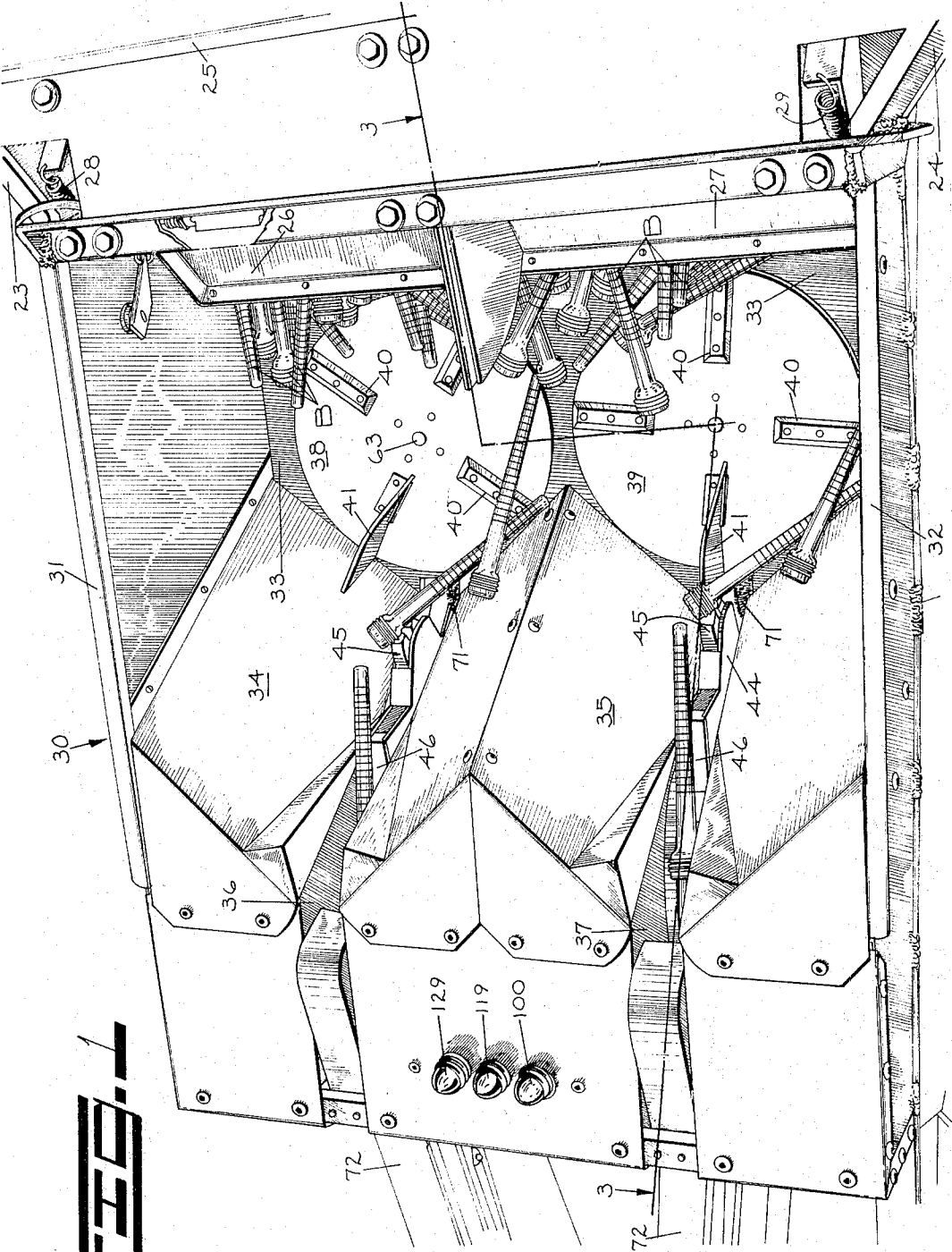


FIG. 1

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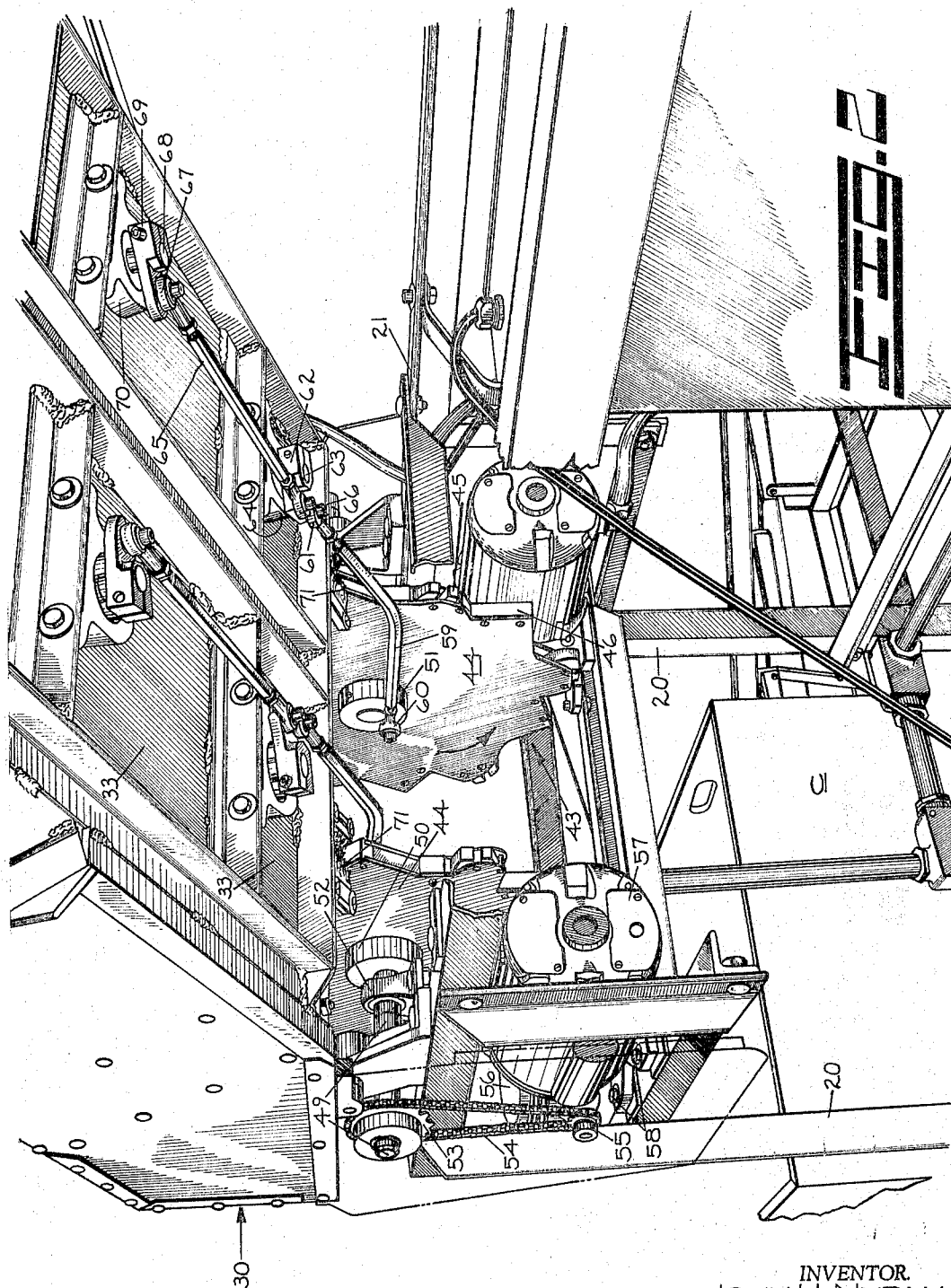
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7 Sheets-Sheet 2



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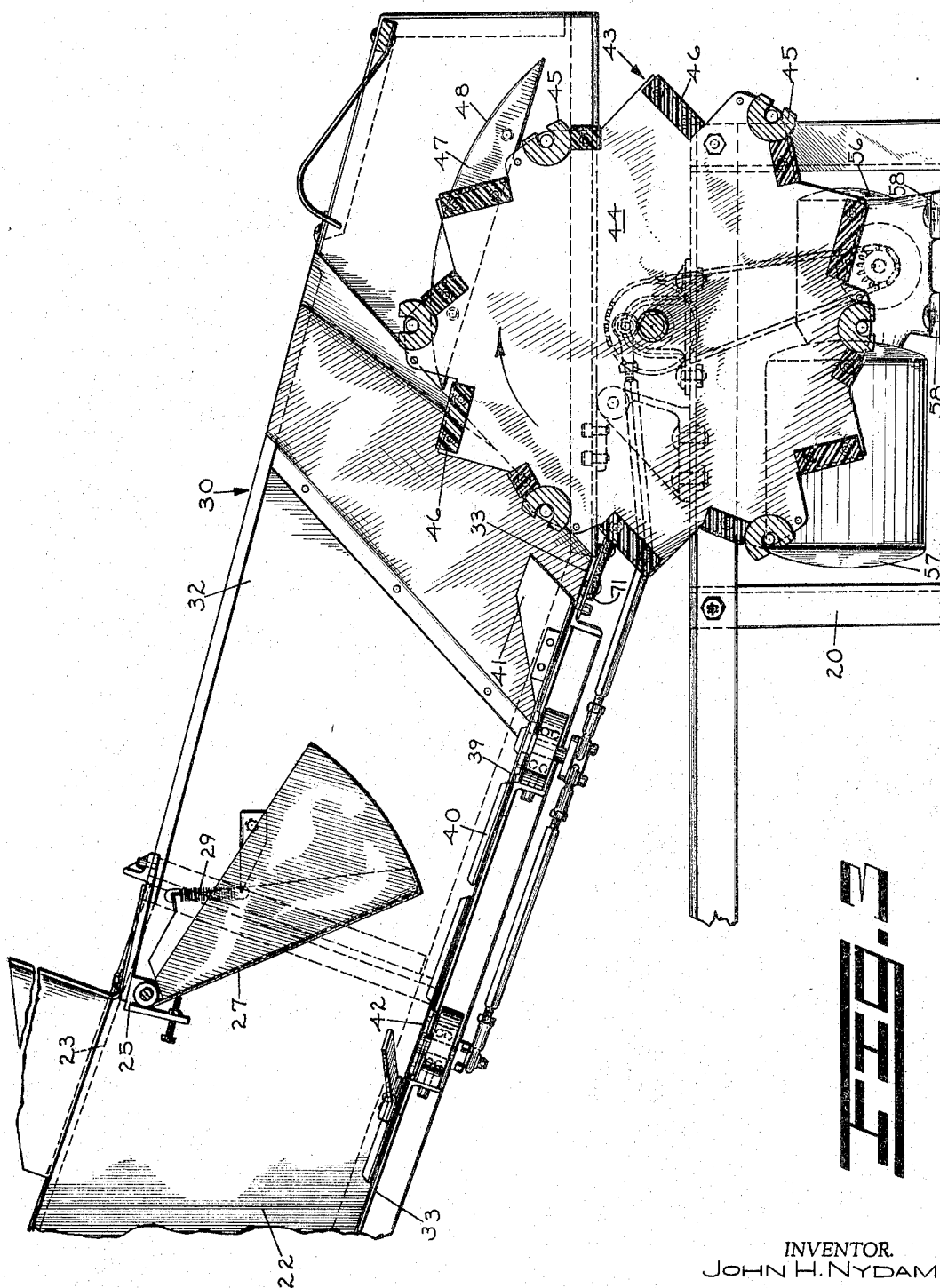
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BOBBIN LOADING APPARATUS

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U.S. PAT. 3,290,857

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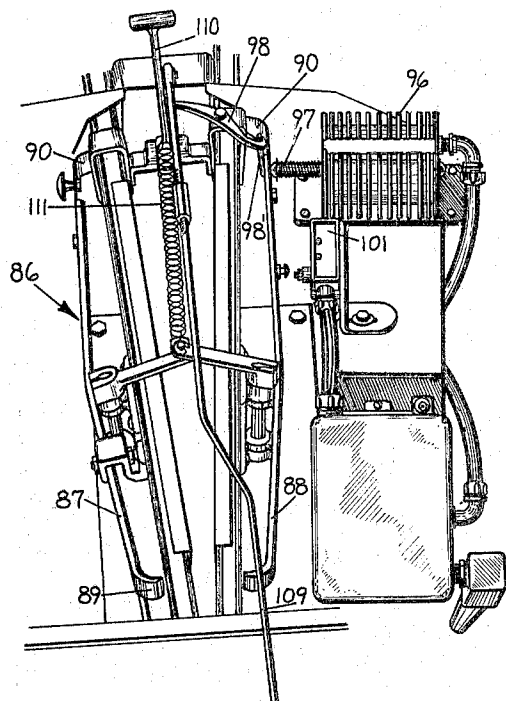
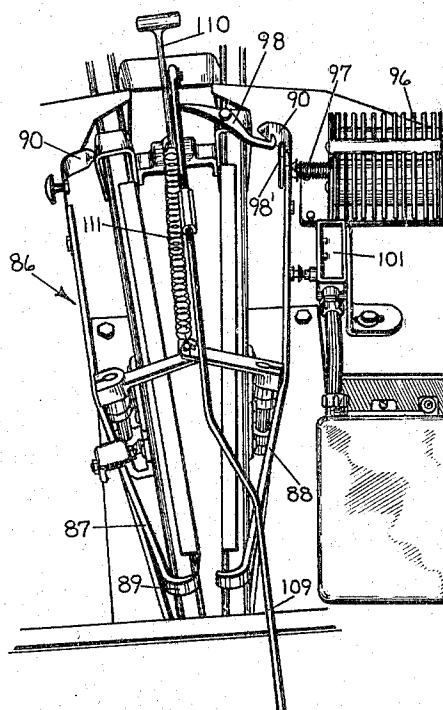
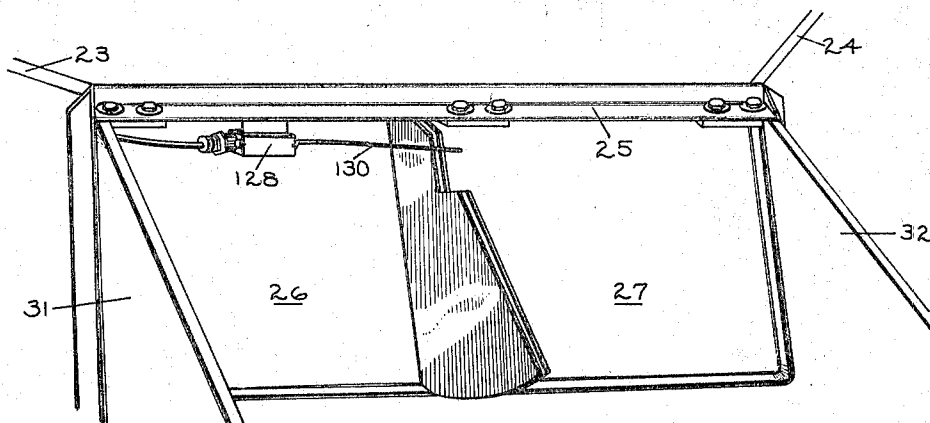
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BOBBIN LOADING APPARATUS

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7 Sheets-Sheet 5



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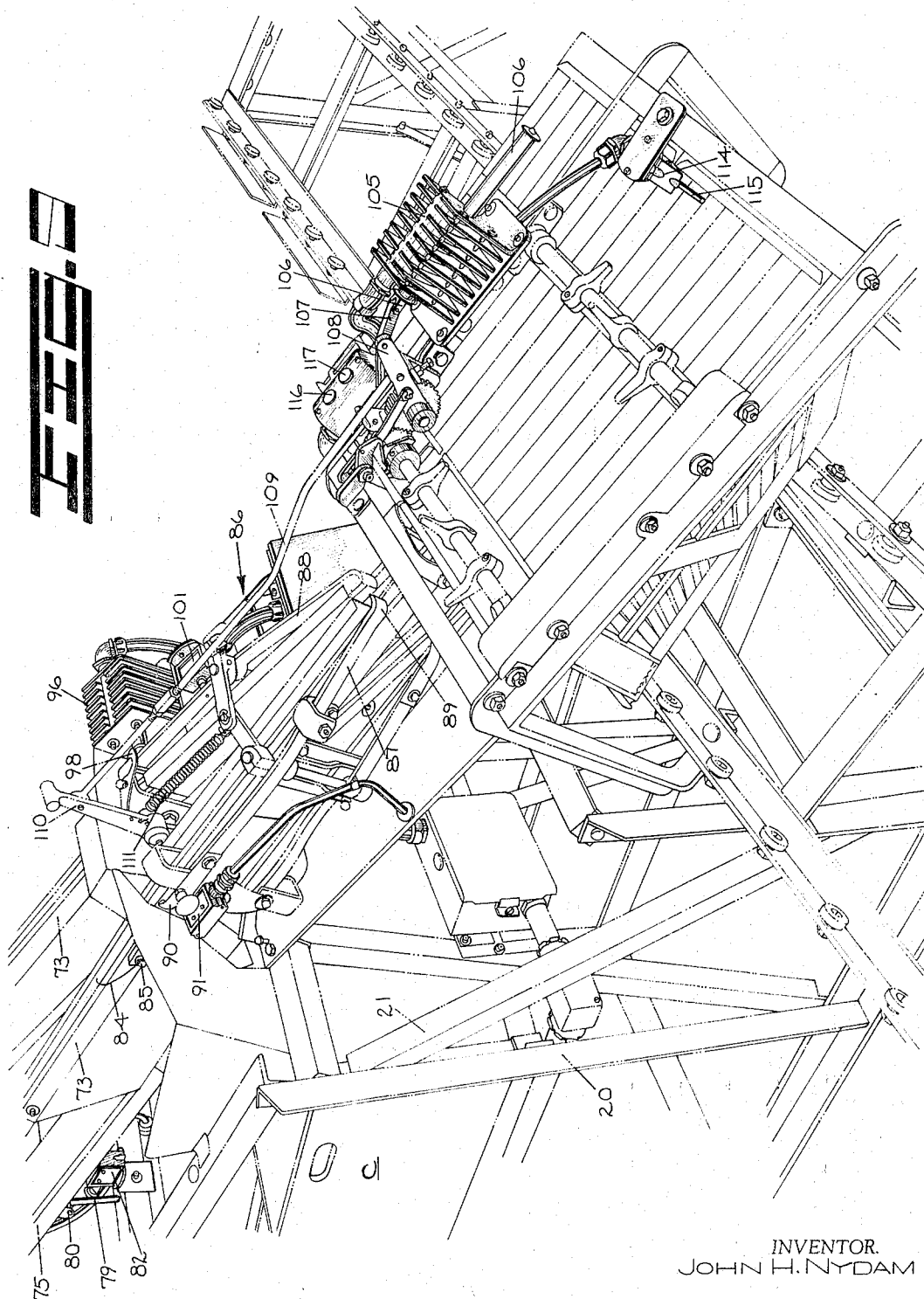
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BOBBIN LOADING APPARATUS

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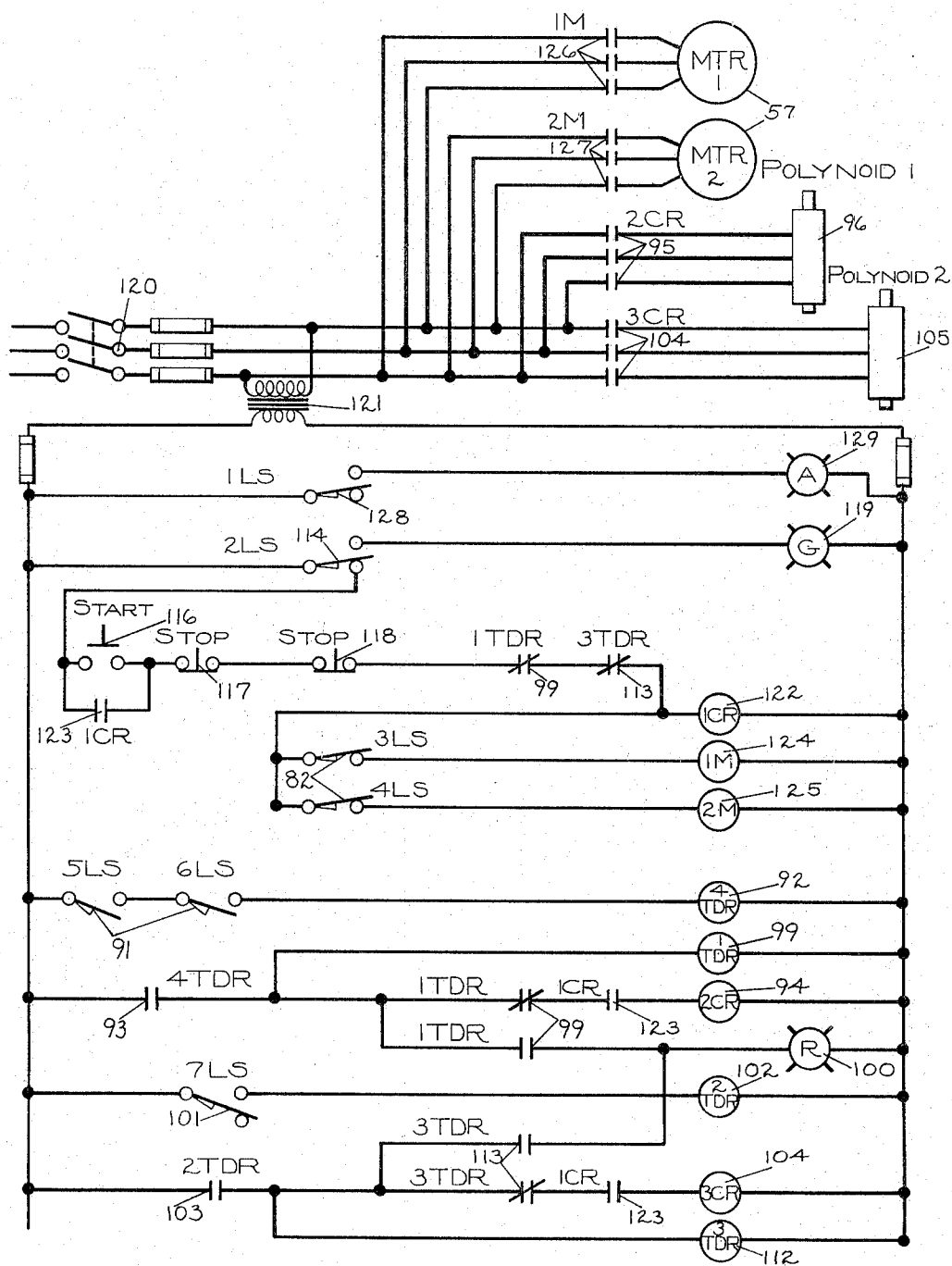
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BOBBIN LOADING APPARATUS

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7 Sheets-Sheet 7



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3,290,857

BOBBIN LOADING APPARATUS

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14 Claims. (Cl. 53—61)

This invention pertains to improvements in bobbin loading apparatus of the type whereby empty filling bobbins are placed into magazines by means which control the quantity and relative position of the bobbins.

The instant invention is concerned with that type of bobbin magazine adapted to feed empty filling bobbins to a combined donning and doffing mechanism for yarn spinning machines such as that disclosed in the United States Patent No. 2,961,822.

The magazine for such a mechanism is comprised of a generally box-shaped container within which are a number of internal divided sections for receiving empty bobbins properly oriented directionally. Within the magazine, when filled and placed upon the donning and doffing mechanism, the bobbins are vertically stacked one upon the other and fill each divided section.

The prior step to donning in the normal use-cycle of the filling bobbin is that of the stripping operation. A small length of yarn remains on each bobbin when it is ejected at the weaving loom and must be removed by a stripper before a new length of yarn can be spun thereon. Bobbins are received from the stripping machines in large quantities and in a jumbled and misaligned condition. They must be oriented and separated into predetermined quantities to properly fill the internal sections of the magazines. An apparatus for loading bobbin magazines is disclosed in a pending United States application by W. H. Banks, Serial No. 215,739, dated August 8, 1962, now U.S. Patent No. 3,210,904. The present invention pertains to definite novel improvements for the operation of the above-cited loading apparatus.

It is the general object of the invention to provide means whereby a number of the repetitive manual operations now required by the above loading apparatus may be performed automatically by electrical switching elements.

It is a further object of the invention, through the introduction of automatic means, to reduce the number of required manual operations.

It is a further object to materially reduce the costs for labor in the operation of the loading apparatus.

It is a still further object of this invention to automatically remove individual bobbins from a large unaligned supply.

Another object is that of orienting the individual bobbins into downwardly inclined rows, each bobbin being held suspended by its upwardly held bobbin butt within either the two quantity control devices.

Another object of the invention is that of determining by electrical means when the quantity control devices are completely filled and to automatically release the bobbins therefrom into the magazine.

It is a further object to index the magazine automatically to the subsequent empty divided sections after a predetermined time delay.

It is another object of the invention to provide automatic stopping means for the loading apparatus in the event a magazine is not present in the loading position.

A further object is to furnish safeguards to cut off the power supply automatically in the event either the quantity control devices or the magazine indexing mechanism should fail to effect proper release within a definite time period.

A still further object of the invention is to provide an

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automatic means for signalling the operator when the bobbin supply in the receiving hopper goes below a preset level.

These and other objects of the invention will become apparent as further details are disclosed.

The invention will be described in greater detail by reference to a specific embodiment thereof as shown in the accompanying figures of drawing, wherein:

FIG. 1 is a perspective view of the bobbin sorting chamber showing the oscillating discs and unsorted supply of bobbins;

FIG. 2 is a perspective view of the mechanism of FIG. 1 as seen from below the chamber;

FIG. 3 is a sectional view taken on line 3—3 in FIG. 1;

FIG. 4 is a side view in perspective of the mechanism for aligning bobbins in rows showing the pivoting member in the operating position;

FIG. 5 is a side elevation of the mechanism of FIG. 4 shown in the supply stopping position;

FIG. 6 is a front view as seen in perspective from above of the trapping, counting and releasing device in the releasing position;

FIG. 7 is similar to FIG. 6 but showing the trapping position;

FIG. 8 is a view in perspective of the signaling device on the entrance doors to the bobbin sorting chamber;

FIG. 9 is a side view in perspective of the lower end of the loading apparatus showing detail of the trapping device and the magazine indexing mechanism;

FIG. 10 is a wiring diagram of the electrical components of the loading apparatus.

The preferred embodiment of this invention is applicable to that type of bobbin loader disclosed in the above cited Patent No. 3,210,904. The apparatus is arranged in a forwardly inclined position to permit each bobbin to gravitate through the several steps of the loading operation with little further urging. Now referring to FIGS. 2 and 3, the general framework 20 is constructed to rest upon the floor and with various bracing members 21, rigidly supports the loading mechanism as hereinafter pointed out and described.

Supported at the rear of the framework and at its highest point is an inclined receiving hopper 22 for receiving a large quantity of unfilled bobbins "B" in an unsorted and unaligned condition as received from the usual bobbin stripping machines (not shown). At the lower side of the hopper 22 the two side members 23 and 24 support an angular brace 25 which in turn supports two downwardly hung pivoting doors 26 and 27 (FIGS. 1—8). These doors tend to assume a generally perpendicular closed position when the hopper 22 is empty of bobbins. A tension spring 28 and 29 is attached to each door and the brace 25 to further urge the doors into a closed position. The weight of a supply of bobbins within the hopper 22 will pivot the doors 26 and 27 outwardly to allow a small continuous quantity to pass beneath.

The bobbins pass from the hopper 22 into a sorting chamber generally designated 30 comprising two side walls 31 and 32 and an inclined smooth-surfaced supporting floor 33 which is a continuation of the under surface of the hopper 22. The forward or bobbin ejecting wall of the chamber 30 (FIG. 1) is of angular conformation which forms two bobbin exits 34 and 35 which lead into two vertical bobbin passages 36 and 37. The width of each passage is sufficient only to allow a single bobbin to pass through a horizontal plane.

Positioned in front of and extending partially within each bobbin exit 34 and 35 are two flat circular discs 38 and 39 which are supported from below so as to be flush with the floor 33 as will be further explained hereinafter. Secured to the upper surface of each disc is a plurality of bobbin pusher pads 40 whose sides are wedge-shaped

(FIG. 1) for moving bobbins to and fro without marring their finished surfaces. Also secured to the surface of each disc in a radial direction is a bobbin moving fin-shaped member 41 whose upper edge extends higher above the disc than do the pads 40. The purpose of the pads 40 and the fin 41 is to withdraw and orient the bobbins received from the hopper 22 by the oscillating motion of the discs 38 and 39 which will be further described.

In line with and to the rear of each disc 38 and 39, positioned beneath the pivoting doors 26 and 27 are two discs 42 similar to those above, with only one being shown (FIG. 3). The two pairs of discs act in unison as separating mechanism to withdraw and orient a steady supply of bobbins from the larger disarranged supply within the hopper 22.

A rotating means is positioned within each bobbin passage 36 and 37 so that the outer periphery of each will pass adjacent the oscillating discs 38 and 39. As the rotating means are similar in both form and operation, only one will be here described. See FIGS. 1, 2 and 3, where a driven rotating wheel, broadly designated 43, is shown as being formed of two generally star-shaped plates 44 which are spaced apart a distance considerably less than the diameter of the butt of a bobbin "B." The preferred embodiment is a twelve-pointed star wheel with a permanent magnet 45 secured to each alternate star point in a manner to direct the poles outwardly from the wheel. The magnets 45 are firmly fixed between the plates 44 and are adapted to rotate therewith. A plastic supporting shelf 46 is attached to each remaining star point which separates each magnet and serves to hold the stem of each bobbin away from any damaging contact with the metal wheel (FIGS. 2 and 3).

A bobbin removing strip 47 in the shape of a segment of a circle is fastened on both sides of each bobbin passage 36 and 37 in a position in relation to the wheel 43 as shown in FIG. 3. The strips 47 are separated from each other within the passage 36 and 37 sufficiently to allow the wheel 43 to rotate but not sufficiently to allow a bobbin butt to pass through. The rotation of the wheel 43 in the direction of the arrow (FIGS. 2 and 3) will bring a plurality of permanent magnets, which are placed about the outer periphery of the wheel, adjacent the oscillating discs 38 and 39 and thereby select and remove single bobbins from the sorting chamber 30. The metallic rings which surround the butts of filling bobbins will be attracted by the passing magnets and the bobbins will be drawn upward by the rotation of the wheel. As the wheel 43 passes the highest point of its rotation, the bobbin butt will contact the arc surfaces 48 of the strips 47 and be forcibly released from the magnetic force and will fall by gravity into the subsequent portion of the loading apparatus to be later described.

The wheel 43 is fixed for rotation with a shaft 49 by an outer collar 50 and an inner collar 51 which are secured to either side of the wheel at its center. As mentioned above, the rotating wheels with their supporting and driving members are exactly alike so that only one will be described. In the drawing (FIG. 2) due to the perspective angle, the descriptive numerals are interspersed between the two rotating members in order to explain like parts on the opposing side of each. The shaft 49 is horizontally supported by bearings 52 (one shown) which are fastened to the frame 20. Rotation is furnished to the wheel 44 by a sprocket 53 fixed to the outer end of the shaft 49 and a link chain 54 which connects to a smaller sprocket 55. The sprocket 55 is keyed to a gear head motor 56 which is interconnected to a suitable electric motor 57 fastened to frame 20 as by bolts 58 (FIGS. 2 and 3). A wheel rotation speed of 25 r.p.m. with a similar number of oscillations for each oscillating disc has been found satisfactory although higher speeds are possible if more powerful magnets are used.

The oscillating motion of the discs is transmitted directly from the rotating wheel 44. A bent rod 59 is loosely secured to a point on the collar 51 by a flexible connector such as a Heim ball end 60. A second ball end 61 connects the rod 59 to a lever 62 which is rigidly connected to the supporting stud 63 for the oscillating disc 38. A bracket 64 is secured to the under bracing 21 and encloses a bearing (not shown) for the stud 63. It will be seen that as the wheel 43 is rotated through linkage by the motor 57, the reciprocating action of the bent rod 59 will, through the stud 63, impart an oscillating motion to the disc 38 positioned above. The angular oscillation should be on the order of ninety degrees for proper results. The upper disc 42 is similarly activated by a straight rod 65 with a ball end 66 loosely connected to the lever 62 at one end and a second ball type end 67 at the other. The upper disc 42 is fixed to a stud 68 to which is firmly attached a lever 69 connecting to the ball end 67. The stud 68 is held in a bearing supporting bracket 70 attached to the bracing 21. When the discs 38 and 39 and 42 are oscillated by the above-explained mechanism, the pusher pads 40 and the fin 41 will separate bobbins from the large jumbled supply and allow them to slide downward toward the rotating wheels 43. The bobbins are urged downward continuously by the discs and will assume a great number of positions. However, the forward wall of the bobbin exits 34 and 35 directs the bobbins toward the rotating wheels where they are contacted and raised by the magnets 45 (FIGS. 1 and 3).

A double brush 71 (FIGS. 1 and 2) is fastened beneath the floor 33 at the opening for the rotating wheel 43 as a means for preventing the bobbin tips from falling through the open space and possibly jamming the machine.

As the bobbins are removed from the rotating wheel 43, explained above, they fall into an aligning means through which they will slide in straight rows. Each aligning means is comprised of two angular trough-shaped plates 72 fastened to two spaced apart tracks 73 which are downwardly inclined toward the front of the machine to support the sliding bobbins by the shoulder of the butt portion. The upper surface of each track 73 is covered with a strip of low friction material 74 of the bobbins (FIG. 4). A bobbin tip restraining channel 75 is positioned beneath each pair of tracks 73 to hold each bobbin tip from swinging downward in advance of the bobbin butt. The channel 75 is supported, to allow a small pivotal motion, by a pin 76 through the upper end of a fixed rod 77 attached to the frame (FIG. 5). A weight 78 is secured to the lower end of the channel 75 to hold that end down while the channel is empty or only partially filled with bobbins. However, if bobbins fill the channel 75, the weight of the bobbin tips will counterbalance the weight 78 and the channel will pivot from the normal operating position to a bobbin stopping position. The channel 75 is restrained from pivoting upward beyond the normal operating position by a rod 79 fastened at one end to the upper leg of the channel 75 by a pin 80 and extending through a hole in a brace member 21 with a nut 81 on the lower end to adjustably control the upward motion (FIG. 5).

In the preferred embodiment of the invention there are two rotating wheels 43 and two pairs of tracks to receive and align bobbins. During the operation of these devices, often one side will fill with bobbins before the bobbin counting means on the opposing side is filled. If the rotating wheel on the filled side were allowed to continue revolving, many bobbins would be brought forward with no space to receive them and they would be cast aside. The pivoting channel 75 is a means to actuate a micro switch 82 by pressing down on the switch arm 83 which opens the power line to that particular motor. This suspends rotation of the magnetic means

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on the filled side only, while allowing the other components to operate. When the bobbins are released from the aligning means, the channel 75 will be pivoted to the operating position by the weight 78 and the microswitch 82 will restart the motor 57. There is a microswitch 82 beneath each channel member 75 and each controls the motor on one side only.

On occasion two bobbins may be drawn through the bobbin passage 37 together, in which case possibly only one will be properly suspended in the aligning tracks 73 with the other bobbin held balanced upon the first. A curved wire 84 is clamped to the outer side of each pair of tracks by a bolt 85 to reject any bobbins which are not properly positioned in the aligning tracks. The bobbins thus rejected fall readily through the framework to a container "C" placed beneath for that purpose.

The two pairs of tracks 73 are extended downward through a trapping, counting and releasing means, generally indicated at 86 (FIGS. 6 and 7), the operation of which has been completely explained in the above-mentioned patent application so that only those parts which are affected by this invention will be enumerated here. In order that a specified number of bobbins be placed into each filling magazine compartment, a counting device is attached to each track and comprises two opposing adjustable rods 87 and 88. These rods are interconnected and coact in opposing directions so that only one need be explained. The lower end of the rod 87 is turned inwardly at 89 to form a trapping means when the rod is pivoted to trap bobbins. The upper end of the rod 87 is also turned inward at 90 so that when the rod is pivoted to release bobbins, a specified number will be released while any additional bobbins will be held back (FIG. 9).

A switching means in the form of a microswitch 91 is placed near the upper end 90 upon each pair of tracks 73 (only one being shown in FIG. 9). Each switch 91 is closed when a bobbin is present in the tracks 73 directly opposite the switch, but as the two switches are wired in series both must be closed to effect the energizing of a coil 92 of a time delay relay (FIG. 10). If the coil 92 is energized for three seconds, the contact points 93 will close and energize the coil 94 which immediately closes the contacts 95 to send current to a Polynoid linear actuator 96 as manufactured by the Skinner Precision Industries Inc., New Britain, Connecticut. The Polynoid 96 is attached to the framework of the loading apparatus in a position to direct the armature 97 against the upper end of the rod 88 when the current is applied. This first actuating means will pivot rod 88 as well as rod 87 to the releasing position and the counted bobbins will be free to slide into the magazine (FIG. 9). A tension held hook member 98 is adapted to hold the rods 87 and 88 in the releasing position by meeting a latching pin 98' secured on the upper end 90 (FIG. 7). The absence of bobbins in the trapping means allows the switches 91 to open which de-energizes the control relay 94 and Polynoid 96. The purpose of the three-second time delay relay in this circuit is to insure against the possibility of two bobbins sliding into the trapping means 86 simultaneously and closing the circuit. With the delay relay present, the trapping means must be filled in both tracks for the switches 91 to be closed for the required time. As protection against the Polynoid 96 being damaged in the event that the bobbins do not release properly and the switches 91 remain closed, a further three-second time delay relay 99 is inserted into the line. This relay 99, if energized, performs a threefold purpose by de-energizing the Polynoid 96, de-energizing both motors 57 and finally energizing a red signal 100 to summon the machine operator (FIG. 10).

A review of the operation to this point shows bobbins being drawn from a large supply and by the magnetic wheels being placed into the aligning tracks where they slide into the trapping and counting means. When the

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required number of bobbins have been trapped in each track, the switches, through a delay relay, energize the Polynoid 96 which pivots the counting rods and releases two rows of bobbins into two sections of a waiting magazine. During the time required for this releasing action, more bobbins are continually being fed into the aligning tracks but are held out of the counting means by the upper end 90 of the rod 88 which is pivoted across the track. The next step in the loading procedure is that of resetting the counting rods 87 and 88 (FIG. 9) and indexing the magazine to present empty sections to the loading position.

A microswitch 101 is secured to the framework so as to be contacted and held open by the rod 88 (FIG. 9) while in the trapping position. The pivoting of the rod 88 to release bobbins closes the switch 101 which energizes a three-second time delay relay coil 102 (FIG. 10) and closes the contact points 103 to thereby energize a control relay 104 and deliver current to a second Polynoid linear actuator 105. The upward motion of the armature 106 in the Polynoid 105 actuates the releasing device for controlling the movement of the magazines. A link member 107 is loosely connected to the outer end of the armature 106 and is also connected to the end of the drive lever 108 for the magazine indexing mechanism for guiding magazines to an outer position which is explained in the above-cited patent application. A connecting rod 109 is attached at one end to the lever 108 and at the upper end to a handle 110 which is in position to trigger the release of the hook member 98 (FIG. 9). When the hook 98 is released, the rods 87 and 88 snap to the trapping position by the force of a tension spring 111 and are in position for receiving bobbins and rod 88 also opens switch 101 to de-energize the Polynoid 105. Time-on protection is included in the line to cut off the Polynoid 105 if the switch 101 is not opened within three seconds. When the contact points 103 pass current to the control relay 104, a coil 112 is energized and if held for three seconds a further time delay relay 113 receives an impulse and performs three functions by de-energizing Polynoid 105, de-energizing both motors 57, and energizing the red signal light 100. This would only occur if the rods 87 and 88 were held from pivoting to the trapping position by incorrectly positioned bobbins.

A stopping switch 114 is fixed at the lower end of the loading frame (FIG. 9) in a position to detect the presence or absence of magazines in the loading apparatus. A switch plunger 115 is raised by contact with the upper surface of a magazine and will be lowered when a magazine is not present. The switch 114 is a single-pole double-throw type in which the raised plunger 115 closes the line through a starting button 116 and stop button 117 to the motors 57 (FIG. 10). This line may also include an auxiliary stop button 118 placed in a convenient position near the rear of the apparatus. When the plunger 115 is allowed to drop, as when no magazine is in the loading position, the switch reverts to the second closed position which immediately shuts off both motors and energizes the line to a green signal light 119.

In the disclosed embodiment the 550-volt power source is received through a switch 120 and carried to the motors 57 and the Polynoid actuators 96 and 105. A transformer 121 presents a 110-volt secondary to the signals and controls of the apparatus (FIG. 10). The starter button 116 will energize a coil 122 which closes a holding relay 123 and also energizes two motor-starting coils 124 and 125 which close contactor points 126 and 127 thereby energizing both motors 57.

A signaling switch 128 (FIGS. 8 and 10) is fastened to the brace 25 at the entrance to the sorting chamber 30 to indicate the shortage of bobbins by lighting an amber signal light 129. A feeler rod 130 acts to open and close the switch 128 by the relative position of the pivoting doors 26 and 27. When the doors are held upward by the presence of bobbins, the switch is open, but when the

absence of bobbins permits the doors to drop vertically, the switch will close and energize the amber signal light 129.

To review briefly the operation subsequent to where two rows of bobbins have been deposited into a magazine, the pivoting motion of rod 88 released the counted bobbins and closed the switch 101 which allowed the delay relay 103 to energize the second Polynoid 105. The action of its armature released the magazine so that empty sections were indexed and at the same time reset the counting rods by freeing the hook 98. This opened the switch 101 and allowed the Polynoid armature 106 and connecting linkage to return to a rest position. This procedure is repeated as long as bobbins and empty magazines are supplied to the apparatus. The various knock-off switches and time delay relays that have been explained are to protect the apparatus against damage and to signal an operator when required.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

I claim:

1. In a filling bobbin magazine loading apparatus, an inclined hopper for containing a supply of unsorted and unaligned bobbins, a bobbin sorting chamber downwardly adjacent said hopper, a floor member forming the bottom of said chamber, oscillating means being held flush with said floor member for withdrawing and orienting bobbins as received from said hopper, said oscillating means comprising a flat circular disc, and a plurality of bobbin pusher pads being secured to the upper surface of said disc, and rotating magnetic means for selecting and removing bobbins singly from said oscillating means.

2. In a filling bobbin magazine loading apparatus, an inclined hopper for containing a supply of unsorted and unaligned bobbins, a bobbin sorting chamber downwardly adjacent said hopper, a floor member forming the bottom of said chamber, oscillating means being held flush with said floor member for withdrawing and orienting bobbins as received from said hopper, said oscillating means comprising a flat circular disc, and a plurality of bobbin pusher pads being secured to the upper surface of said disc, rotating magnetic means for selecting and removing bobbins singly from said oscillating means, means for aligning in rows a continuing supply of bobbins from said rotating means, a trapping, counting and releasing means for loading a predetermined number of bobbins into a bobbin magazine, switch means for transmitting an electrical impulse upon said trapping means receiving the predetermined number of bobbins, and an actuating means for pivoting said trapping means effecting the release of bobbins therefrom, said switch means being adapted for transmitting an electrical impulse to said actuating means after a measurable time delay.

3. The apparatus of claim 2 wherein said magnetic means comprises a rotatable member having a generally star-shaped periphery, and a plurality of permanent magnets secured to said periphery.

4. The apparatus of claim 2 wherein the said means for aligning bobbins in rows is adapted to automatically suspend rotation of said magnetic means when bobbins fill said aligning means and to automatically restart rotation when the supply of bobbins in said aligning means is partially depleted.

5. An apparatus for loading a filling bobbin magazine having a plurality of internal divided sections with empty filling bobbins including in combination an inclined hopper for containing a supply of unsorted and unaligned bobbins, a bobbin sorting chamber downwardly adjacent said hopper, a floor member forming the bottom of said

chamber, oscillating means being held flush with said floor member for withdrawing and orienting bobbins as received from said hopper, said oscillating means comprising a flat circular disc, and a plurality of bobbin pusher pads being secured to the upper surface of said disc, rotating magnetic means for selecting and removing bobbins singly from said oscillating means, means for aligning in rows a continuing supply of bobbins from said rotating means, a trapping, counting and releasing means for loading a predetermined number of bobbins into said magazine, means for controlling movement of said bobbin magazines transversely of said rows consecutively to position said sections in proper alignment for reception of a full complement of said bobbins, said movement controlling means being automatically actuated by the releasing of bobbins from said trapping means, and other means for guiding full bobbin magazines to a stationary position out of range of said loading apparatus to be there available for further disposal.

6. The apparatus of claim 5 wherein said magnetic means comprises a rotatable member having a generally star-shaped periphery, and a plurality of permanent magnets secured to said periphery.

7. The apparatus of claim 5 wherein said means for aligning bobbins in rows comprises a bobbin tip restraining channel for causing the butt of each bobbin to precede the bobbin tip in passing therethrough, said channel being adapted to pivot from a normal operating position to a bobbin supply stopping position, said stopping position automatically suspending rotation of said magnetic means when bobbins fill said aligning means, said normal operating position automatically restarting rotation of said magnetic means when the supply of bobbins in said aligning means is partially depleted.

8. The apparatus of claim 5 which includes switching means for transmitting an electrical impulse upon said trapping means receiving the predetermined number of bobbins, and an actuating means for pivoting said trapping means effecting release of bobbins therefrom, said switching means being adapted for transmitting an electrical impulse to said actuating means after a measurable time delay.

9. The apparatus of claim 5 wherein said means for guiding magazines to a stationary position also includes an automatic stopping device being adapted to stop the loading apparatus if an empty magazine fails to assume the loading position.

10. The apparatus of claim 5 which includes a signaling mechanism being adapted to signal when the supply of bobbins in the said inclined hopper drops below a specific quantity.

11. In a filling bobbin loading apparatus, an inclined hopper for containing a supply of unsorted and unaligned bobbins, a bobbin sorting chamber downwardly adjacent said hopper, a floor member forming the bottom of said chamber, oscillating means being held flush with said floor member for withdrawing and orienting bobbins as received from said hopper, said oscillating means comprising a flat circular disc, and a plurality of bobbin pusher pads being secured to the upper surface of said disc, rotating magnetic means for selecting and removing bobbins singly from said oscillating means, means for aligning in rows a continuing supply of bobbins from said rotating means, rejecting means for bobbins not properly positioned in said means for aligning bobbins in rows, a trapping, counting and releasing means for loading a predetermined number of bobbins into a bobbin magazine, switching means for transmitting an electrical impulse upon said trapping means receiving the predetermined number of bobbins, and an actuating means for pivoting said trapping means effecting the release of bobbins therefrom, said switching means being adapted for transmitting an electrical impulse to said actuating means after a measurable time delay.

12. In a filling bobbin magazine loading apparatus, an

inclined hopper for containing a supply of unsorted and unaligned bobbins, a bobbin sorting chamber downwardly adjacent said hopper, a floor member forming the bottom of said chamber, oscillating means being held flush with said floor member for withdrawing and orienting bobbins as received from said hopper, said oscillating means comprising at least one flat circular disc, and a plurality of bobbin pusher pads being secured to the upper surface of each said disc, and at least one rotating magnetic means for selecting and removing bobbins singly from each said oscillating means.

13. In a filling bobbin magazine loading apparatus, an inclined hopper for containing a supply of unsorted and unaligned bobbins, a bobbin sorting chamber downwardly adjacent said hopper, a floor member forming the bottom of said chamber, oscillating means being held flush with said floor member for withdrawing and orienting bobbins as received from said hopper, said oscillating means comprising at least one flat circular disc, and a plurality of bobbin pusher pads being secured to the upper surface of each said disc, rotating magnetic means for selecting and removing bobbins singly from each said oscillating means, at least one means for aligning in rows a continuing supply of bobbins from said rotating means, a trapping, counting and releasing means for each said aligning means for loading a predetermined number of bobbins into a bobbin magazine, switching means for transmitting an electrical impulse upon each said trapping means receiving the predetermined number of bobbins, a first actuating means for simultaneously pivoting each said trapping means effecting the release of bobbins held therein, said switching

means being adapted for transmitting an electrical impulse to said first actuating means after a measurable time delay, means for controlling movement of said bobbin magazines transversely of said aligning rows consecutively to position said sections in proper alignment for reception of a full complement of said bobbins, a second actuating means being adapted to effect motion to said means for controlling movement of said magazines simultaneously resetting said trapping means into position to trap bobbins, and a second switch means for transmitting an electrical impulse to said second actuating means after a measurable time delay.

14. The apparatus of claim 13 which includes protective means for cutting off power to said loading apparatus in the event the electrical impulse being delivered to either said first or second actuating means remains in force beyond a predetermined time period.

References Cited by the Examiner

UNITED STATES PATENTS

1,442,866	1/1923	Elliott	221—212 X
2,621,824	12/1952	Gookin	221—168
2,819,816	1/1958	Moeltzner et al.	221—212 X
3,210,904	10/1965	Banks	53—35

FOREIGN PATENTS

132,763	9/1919	Great Britain.
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