Aug. 8, 1961 W. SIEGENTHALER 2,994,999

BOBBIN DEPOSITING MECHANISM

Filed Sept. 12, 1960 2 Sheets-Sheet 1

Fig. 1

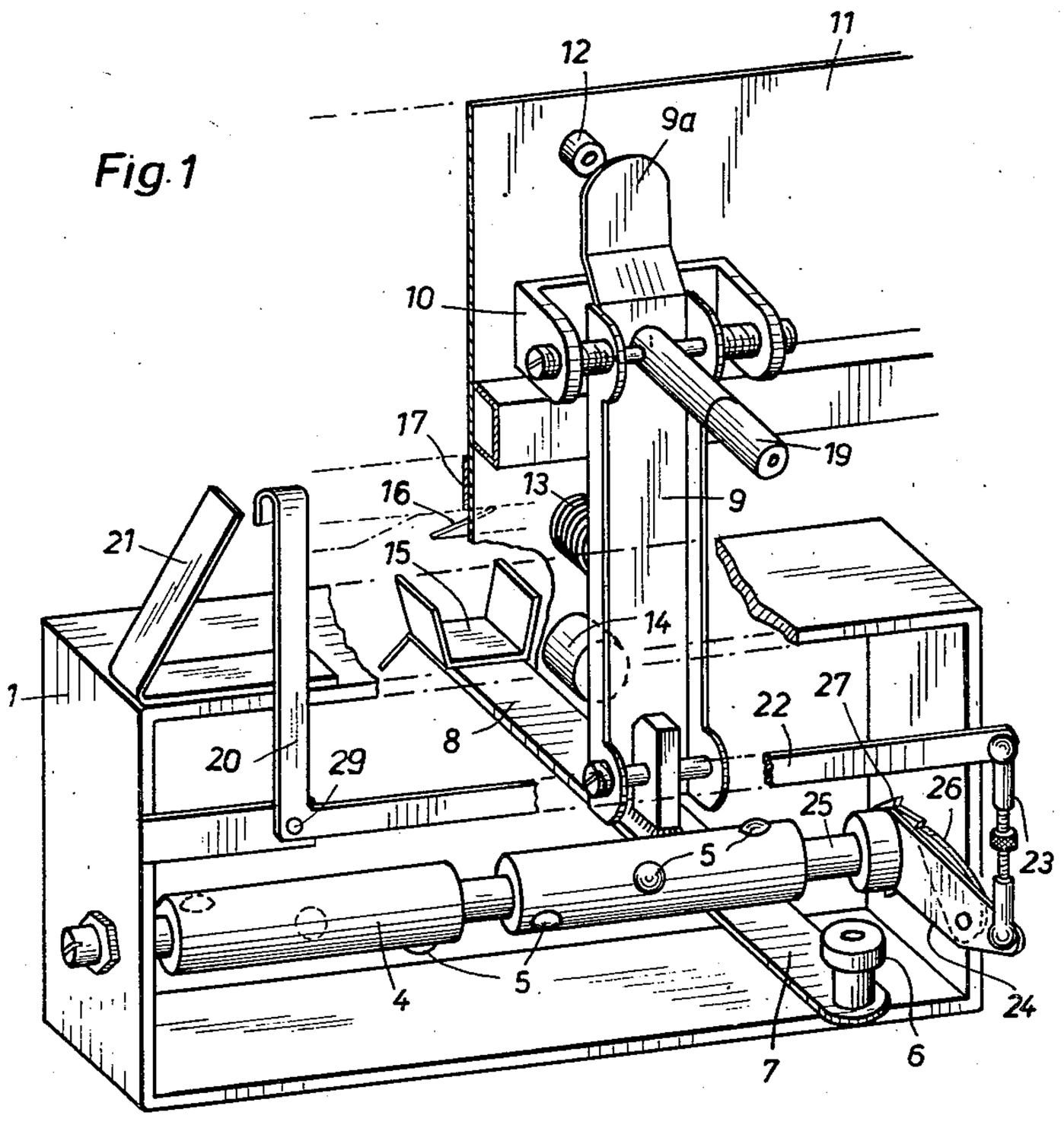

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Fig. 2

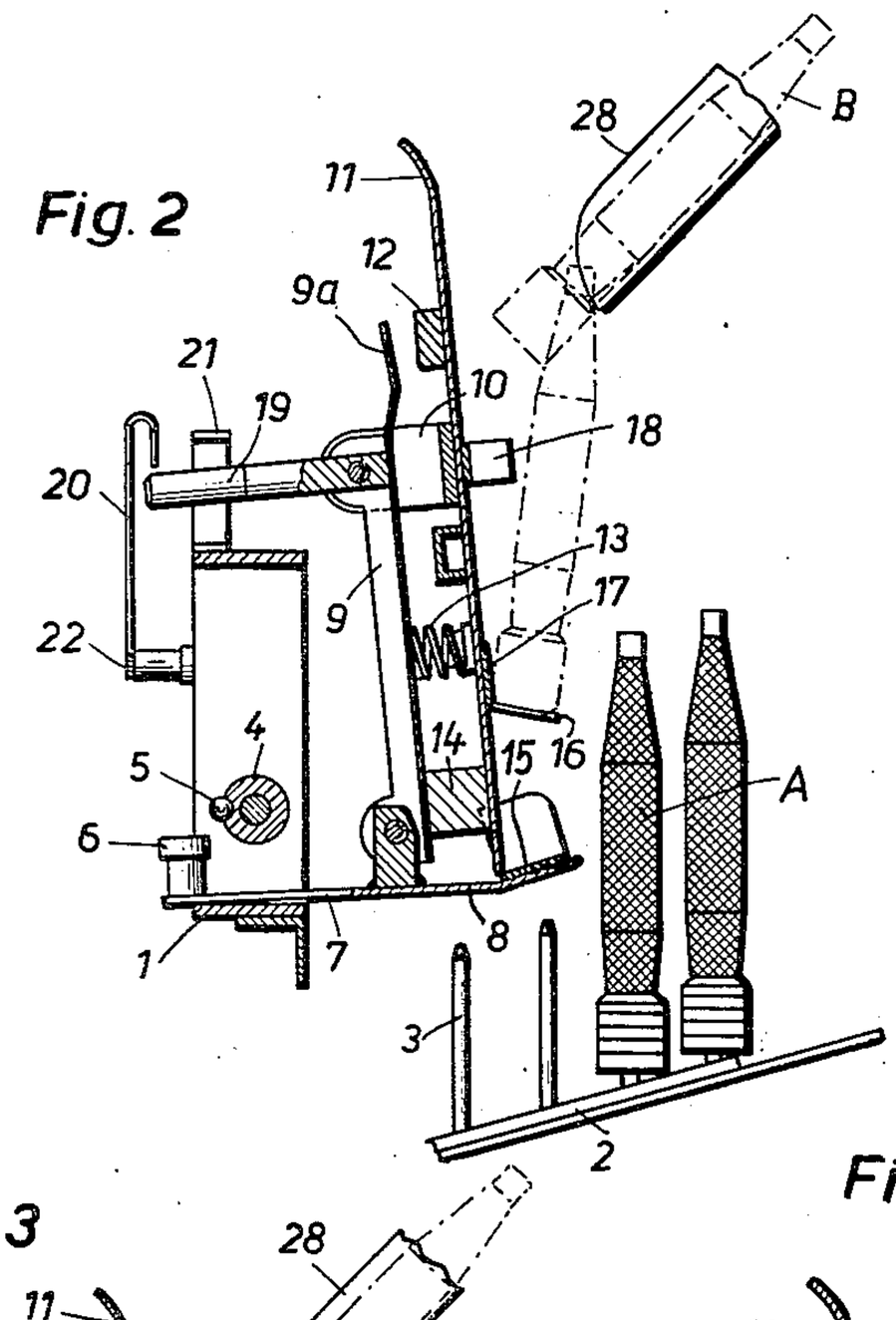


Fig. 3

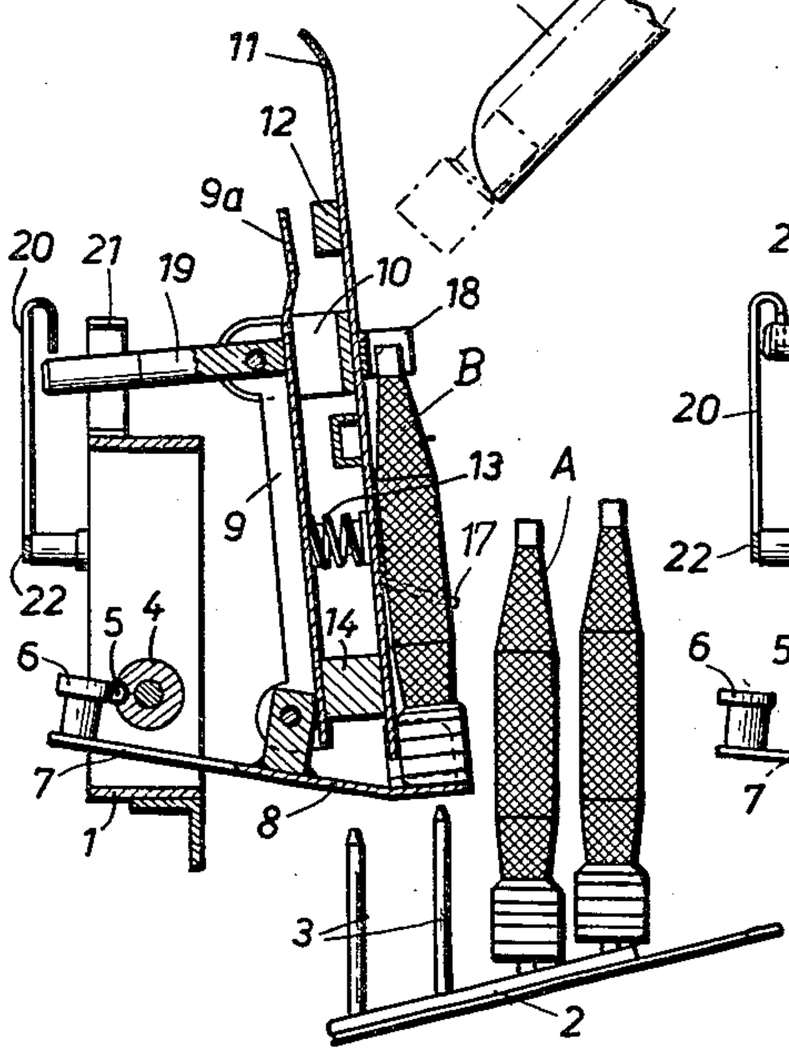
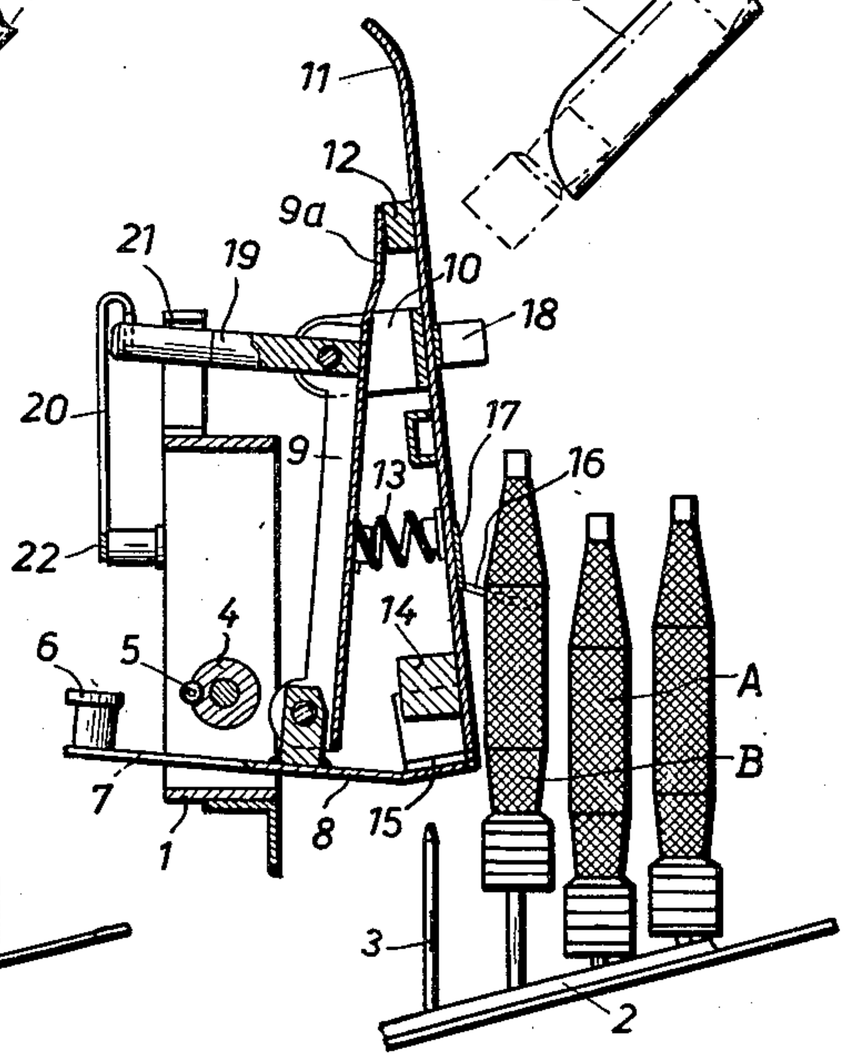


Fig. 4



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BOBBIN DEPOSITING MECHANISM

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6 Claims. (Cl. 53—197)

This invention relates to bobbin depositing mechanism for winding machines of the type in which the bobbins at a winding station are ejected into a chute in which they slide down for delivery to a supporting ledge which effects a traversing movement in a direction transversely to the delivery chute.

Depositing devices are known in which the reciprocatory supporting ledge itself is formed as creel board having creel pins, the movement of the ledge being controlled in response to the release of the bobbins at the winding station. It has been found that this construction has various disadvantages; particularly it may be subjected to incorrect control operations, for example it may occur that creel pins of the creel board remain unoccupied, or that the supporting ledge will not advance when, for any reasons, not a full but an empty bobbin is ejected from the winding station.

It is an object of the present invention to provide an improved mechanism for depositing bobbins on the creel pins of a creel board, which is of simple structure, efficient in operation and substantially trouble free.

The invention will now be described in detail in connection with the accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view of a bobbin depositing mechanism according to the invention;

FIGS. 2 to 4 each are a vertical cross-section through the mechanism according to FIG. 1 in various operating phases.

The drawings show a frame-shaped casing 1 which is secured in any desired manner to a winding machine. In proximity to the casing 1 the winding machine carries a creel board 2 which is intermittently movable towards the casing 1 and is provided with creel pins 3 disposed in a plurality of rows. A control cylinder 4 is rotatably mounted in the end walls of the casing 1 and is provided around its periphery with a number of cams 5, corresponding to the number of the rows of creel pins. The cams 5 on the cylinder 4, which in the example illustrated is shown in a two piece arrangement, are displaced in longitudinal and circumferential direction on the periphery of the cylinder, so that after each step of the intermittently rotatable cylinder 4 one of the cams 5 will be placed in sensing position. A feeler roll 6 freely rotatable on an arm 7 of a twin lever 7, 8 is provided to cooperate with the cams 5. The twin lever 7, 8 is mounted on the lower end portion of an oscillating lever 9 for pivoting movement in a vertical plane. This lever 9 is suspended on a bearing bracket 10 and is upwardly extended by a tongue 9*a* at its top end. The bearing bracket 10 is secured to a supporting ledge 11 extending across the entire width of the machine. The supporting ledge 11 carries on its rear side facing the lever 9 a permanent magnet 12 adapted to coact with the tongue 9*a* of the lever 9. A coil spring 13 which is arranged underneath the suspension point of the lever 9 between the latter and the ledge 11 tends to draw the pendulum 9 towards an abutment 14, which is arranged on the ledge 11, and to pull the tongue 9*a* of the lever 9 away from the magnet 12. The second arm 8 of the double lever 7, 8 has on its free end portion a bottom piece 15 provided with downwardly inclined side walls; this bottom piece 15 is situated in its effective position immediately below a recess 16 provided in one wall of a catch rail 17 formed

by an angle iron secured to the supporting ledge 11. The width of the recess 16 is somewhat larger than the maximum diameter of a full bobbin. A forked holder 18 is provided on the supporting ledge 11 above the recess 16 in the rail 17. From the point of suspension of the oscillating lever 9, a switch bolt 19 projects rearwardly. The bolt is destined to cooperate with a lever arm 20 and with a stop member 21. While the stop member 21, forming an inclined guide, is fixed to the casing 1, the lever 20 formed of the two lever arms 20, 22 is linked to the casing 1 at 29, the arm 22 being connected to a switch arm 24 by means of a link rod 23 of adjustable length; the arm 24 is mounted on the shaft 25 of the drum 4 so as to be freely rotatable and carries a ratchet 26 which coacts with a ratchet wheel 27 fixed to the shaft 25.

The operation of the described bobbin depositing mechanism is as follows: In FIG. 2 the movable parts of the mechanism are shown in their starting position ready for operation, which is that position which the parts occupy after a bobbin A has been delivered to a vacant pin 3 of the creel plate 2 and before an additional bobin B passes from a winding station into a slide-way 28 which is inclined and leading towards the supporting ledge 11 (FIG. 2). The oscillating lever 9 suspended on racket 10 is drawn slightly in forward direction towards the abutment 14 of the ledge 11 by means of the spring 13, so that the tongue 9*a* is separated from the magnet 12 and the bottom piece 15 projects beyond the ledge 11 immediately underneath the recess 16 in the rail 17. The weight of the arm 7 of the double lever 7, 8 carrying the feeler roll 6 is selected to be somewhat heavier than the weight of the arm 8, so that the latter, in unloaded condition, is slightly inclined upwards and abuts against the lower edge of the ledge 11. As shown in FIG. 2, the roll 6 is situated in this case remote of the periphery of the control cylinder 4. Upon operation of the winding machine the supporting ledge 11 effects a continuous traverse to and fro along the creel plate 2, together with all the elements carried by it. A full bobbin B delivered from a winding station passes into the slide-way 28 and falls down on the rail 17 secured to the supporting ledge 11. The distance of this rail from the end of the slide-way 28 is selected so that the head of the bobbin is still situated in the slide-way when the bobbin bears on the rail 17, the bobbin being thus retained in the position shown in dash and dot lines in FIG. 2. During the traverse movement of the ledge 11 the recess 16 of the rail 17 passes below the butt of the bobbin, so that the bobbin B drops downwardly into the position indicated in FIG. 3 and thereby bears upon the bottom member 15. The weight of the bobbin B (and also of an empty bobbin) then causes the double lever 7, 8 to tilt in clockwise direction, so that the feeler roll 6 on the arm 7 bears against the periphery of the cylinder 4. As mentioned, the cams 5 are arranged along the surface of the cylinder according to the spacing of the pin rows on the creel plate. The cam 5 corresponding to the next creel pin 3 to be served is situated on the line of feeling of the roll 6. When the roll 6 in the course of the traverse movement of the ledge 11 arrives at this cam 5, it will be slightly urged outwards by the latter. Accordingly, the lever 9 is also pulled slightly rearwards about its point of suspension, so that the tongue 9*a* approaches the magnet 12. The height of the cams 5 is so selected that the said approach of the tongue 9*a* towards the magnet 12 suffices to cause the latter to become fully effective on the tongue; consequently, the magnet 12 attracts the tongue 9*a* against the action of the spring 13, whereby the lever 9 suddenly swings rearwardly (FIG. 4). The roll 6 moves away from the periphery of the cylinder 4 and also the bottom piece 15 jumps back behind the supporting ledge 11. The bobbin B, after it had dropped upon the bottom member 15,

is retained in the recess **16** of the rail **17** and thus taken along with the supporting ledge **11** during the traverse movement thereof; when the bottom piece **15** jerks back upon attraction of the tongue **9***a* by the magnet **12**, the bobbin freely falls downwardly. Since the position of the cam **5** of the cylinder **4**, which releases the retraction of the bottom member **15**, corresponds at this moment exactly to the position of the recess **16** above the pin **3** of the creel plate to be supplied, the bobbin B drops exactly onto this pin. In the course of the further traverse movement of the supporting ledge **11** together with the oscillating lever **9**, the bolt **19** abuts against the lever arm **20** and causes a pivoting movement of the lever **20**, **22** in counter-clockwise direction in FIG. 1, thereby raising the link **23**; this link in turn angularly moves the arm **24**, whereby the ratchet **26** rotates the ratchet wheel **27** through one step. Correspondingly, the cylinder **4** is also rotated, the rate of movement of the lever **20**, **22** and the pitch of the ratchet wheel **27** being selected so that a rotation of the latter by one tooth rotates the cylinder **4** by such an amount that the cam **5** of the cylinder corresponding to the pin **3** of the creel plate to be supplied next, passes into the aforementioned effective line of feeling of the roll **6**. In the further course of the traverse movement of the supporting ledge **11**, the bolt **19** strikes against the stop member **21** and is urged downwardly by the inclined surface of the latter. This movement of the bolt **19** causes the lever **9** to swing towards the supporting ledge **11**, whereby the tongue **9***a* is retracted from the magnet **12** and the lever **9** is applied against the stop **14** by the spring **13**. The mechanism is now again in its starting position ready for the reception and delivery of a further bobbin. When the bolt **19** is urged into its lower position by the inclined surface of the stop **21**, the direction of movement of the ledge **11** also reverses (released by change-over means not shown, actuated by the winding machine and not forming a part of this invention). The bobbin which in the course of this return movement of the ledge **11** first falls upon the rail **17** and subsequently drops through the recess **16** onto the bottom piece **15**, thus is automatically delivered to the creel pin associated with the next cam **15**, as soon as the roll **5** moved concurrently with the ledge **11** engages this cam. When, for any reason, no bobbin drops onto the bottom piece **15**, then the lever **7**, **8** remains in the position shown in FIG. 2, in which position the feeler roll **6** is situated outside of the operating zone of the cam **5** located in effective position; a release of the locking position for the bottom piece **15** does not take place; since in this case the switching bolt **19** is slightly inclined in downward direction, it is not able to actuate the lever **20** when the supporting ledge is reciprocating, so that no further switching operation of the cylinder **4** takes place. Independent of the number of reciprocating motions of the supporting ledge **11** and also independent of any bobbin delivery from the winding stations, the release of the bobbin delivery from the supporting ledge **11** and the actuating of the control cylinder **4** thus takes place only when a bobbin actually rests upon the bottom piece **15** or has been dropped from this bottom member piece on a creel pin; it is accordingly impossible that any individual pin of the creel plate is omitted in the delivery of bobbins.

In the example described it has been assumed that part **12** is a magnet, part **14** is an abutting stop, and the spring **13** is a tension spring. However, the construction could be so that **12** is an abutting stop, **14** a magnet and **13** a compression spring. The mode of operation of this modification is then in short the following:

In the starting position according to FIG. 2 with an unloaded bottom piece **15** projecting beyond the supporting ledge **11**, the lever **9** is firmly held by the magnet **14** against the action of the spring **13**. When, after the bottom piece **15** has been loaded with a bobbin B, the feeler roll **6** slides over the cam **5** situated in operative position, the lever **9** is separated from the magnet **14** to such an extent that the compression spring **13** is able to suddenly swing the lever **9** rearwardly (FIG. 4). When the bolt **19** is downwardly urged by the inclined guide stop **21**, the lever **9** approaches the magnet **14** against the action of the spring **13** to such an extent that this magnet **14** is able to completely attract the lever, so that the starting position (FIG. 2) is again reached.

I claim:

1. In a bobbin depositing mechanism for winding machines having a creel board and an inclined slide way adapted to receive bobbins ejected from a winding station of the machine, a traversing bobbin supporting ledge movable transversely to said slide way, a bottom piece carried by said supporting ledge and movable relatively thereto, said bottom piece being adapted to receive and support a bobbin delivered from said slide way, a control cylinder movable in response to a bobbin being deposited on said creel board, cam means arranged on said control cylinder in correspondence to the arrangement of creel pins on said creel board, a feeler member operatively connected with said bottom piece and coacting with said control cylinder, and means operative upon said feeler member meeting one of said cam means to cause movement of said bottom piece to an ineffective position and transfer of the bobbin supported thereon to a creel pin on said creel board.

2. In a bobbin depositing mechanism for winding machines having a creel board and an inclined slide way adapted to receive bobbins ejected from a winding station of the machine, a traversing bobbin supporting ledge movable transversely to said slide way, a bobbin catch rail carried by said ledge and adapted to receive bobbins delivered from said slide way, the distance between said rail and the delivery end of said slide way being shorter than the length of a bobbin, a bottom piece carried by said supporting ledge and movable transversely thereto, said bottom piece being adapted to receive and support a bobbin to be delivered on a creel pin of said creel board, a control cylinder movable in response to a bobbin being deposited on said creel board, cam means arranged on said control cylinder in correspondence to the arrangement of creel pins on the creel board, a feeler member operatively connected with said bottom piece and coacting with said control cylinder, said bobbin catch rail being provided with a recess situated above said bottom piece in position of rest, whereby a bobbin resting on said rail and maintained in its position by the delivery end of said slide way falls through said recess and onto said bottom piece when in the course of the traversing movement of said ledge the recess in said rail arrives underneath said bobbin, and means operative upon said feeler member meeting one of said cam means on the control cylinder to cause movement of said bottom piece to an ineffective position and transfer of the bobbin supported thereon to a creel pin of said creel board.

3. A bobbin depositing mechanism as claimed in claim 2, in which said bottom piece is carried by one arm of a double lever linked to an oscillatory lever movable in a vertical plane extending at right angles to the direction of movement of said supporting ledge, said oscillatory lever being suspended on the side of said supporting ledge opposite of the slide way, said feeler member cooperating with the cam means on said control cylinder being carried by the other arm of said double lever.

4. A bobbin depositing device as claimed in claim 2, and comprising a spring tending to pull said oscillatory lever towards said supporting ledge, and a magnet acting on said oscillatory lever to swing it away from said ledge, whereby, when said bottom piece is not loaded by a bobbin, said oscillatory lever bears against an abutment on said ledge and is released from the magnet, while said double lever carrying the bottom piece and the feeler member is held owing to its weight in a position in which the double lever abuts against the lower edge of said

ledge with said bottom piece projecting beyond the ledge, and the feeler member being remote of said control cylinder, and when said bottom piece is loaded by a bobbin, said double lever is swung to a position in which said bottom piece still projects beyond the ledge, but the feeler member engages said control cylinder and is acted upon by one of said cam means during the traverse movement of the ledge, so that said double lever is moved and the oscillatory lever swung away from said abutment and an extension thereof brought into the range of action of said magnet which causes a sudden oscillation of said lever away from the supporting ledge against the action of said spring, to retract said bottom piece to the rear of the ledge and cause the bobbin thereon to drop on a creel pin of the creel board.

5. In a bobbin depositing mechanism for winding machines having creel board and an inclined slide way adapted to receive bobbins from a winding station of the machine, a traversing bobbin supporting ledge movable transversely to said slide way, an oscillatory lever suspended from said ledge on the side thereof opposite to said slide way, a spring tending to urge said oscillatory lever away from said ledge, a magnet carried by said ledge and acting to attract said oscillatory ledge against the action of said spring, a double armed lever linked to the free end of said oscillatory lever, a bottom piece carried by one arm of said double armed lever, a feeler member carried by the other arm of the lever, a control cylinder movable in response to a bobbin being deposited on a creel pin of said creel board, cam means arranged on said control cylinder in correspondence to the arrangement of creel pins on said creel board, said feeler member coacting with said cam means on the control cylinder, a bobbin catch rail carried by the supporting ledge on the side thereof, facing said slide way, the vertical distance between said rail and the delivery end of said slide way being shorter than the length of a bobbin, said bobbin catch rail being provided with a recess situated above said bottom piece in position of rest, whereby a bobbin resting on said rail and maintained in its position by the delivery end of the slide way will fall through said recess onto said bottom piece when in the course of traversing movement of said ledge the recess in said rail arrives underneath said bobbin, and whereby, when said bottom piece is loaded by a bobbin and said feeler member meets a cam means on said control shaft, said double armed lever will be released from the magnet and said spring will cause a sudden oscillation of said oscillatory lever away from the supporting ledge to retract said bottom piece to the rear of the ledge and cause the bobbin thereon to drop on a creel pin of the creel board.

6. A bobbin depositing mechanism as claimed in claim 3, in which said oscillatory lever carries a rearwardly directed switch bolt in proximity to its point of suspension, and comprising a ratchet device connected to said control cylinder, lever means operatively connected with said ratchet device, said lever means coacting with said switch bolt when after deposition of a bobbin from said bottom piece this latter is in rearwardly retracted position, and a stop member provided with an inclined surface acting on said switch bolt at the end of the traversing stroke of said ledge to return said oscillatory lever to its starting position.

No references cited.