Oct. 10, 1944. W. I. GLADFELTER ET AL 2,359,838

WAX COATING MACHINE

Filed July 29, 1940 5 Sheets-Sheet 1

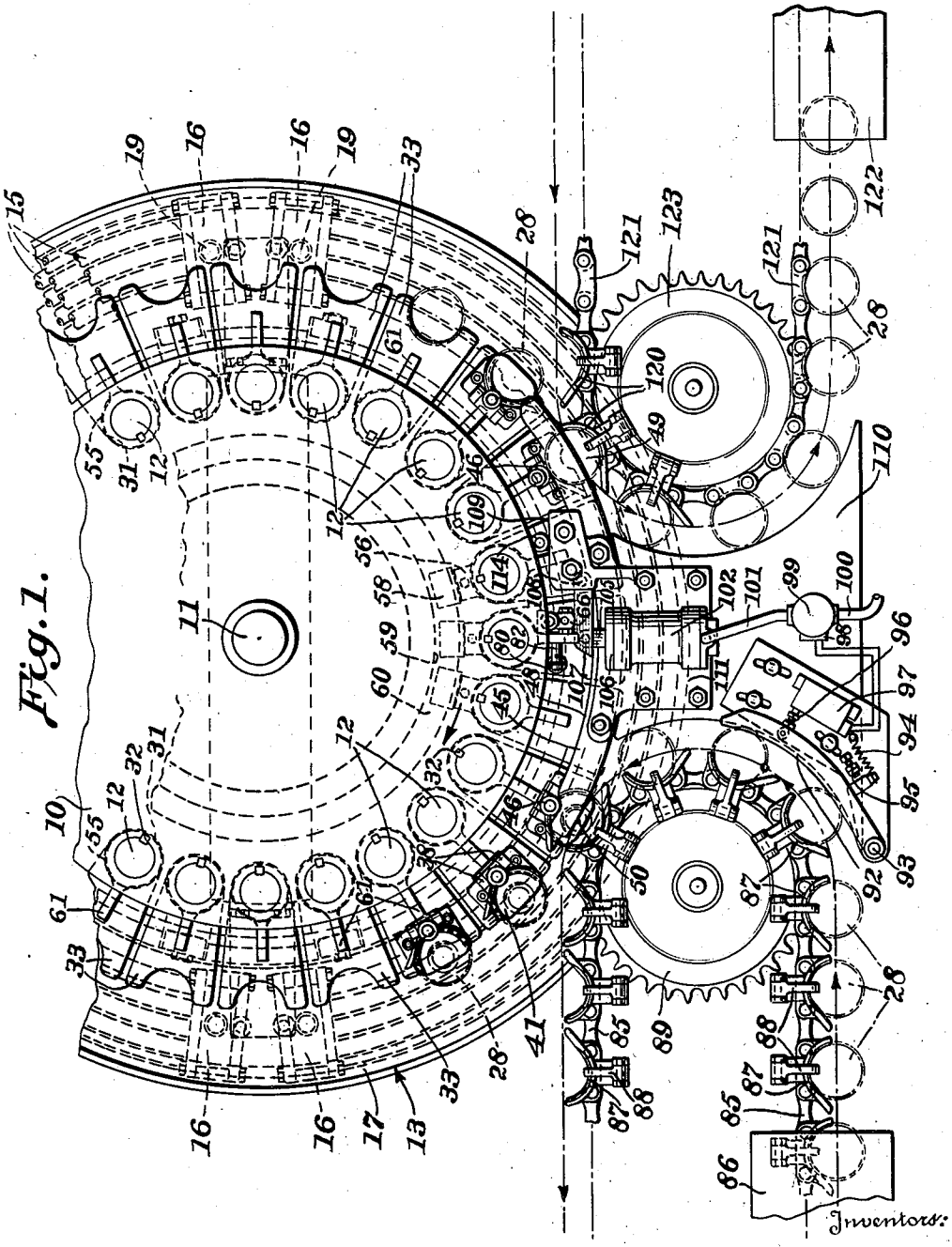


Fig. 1.

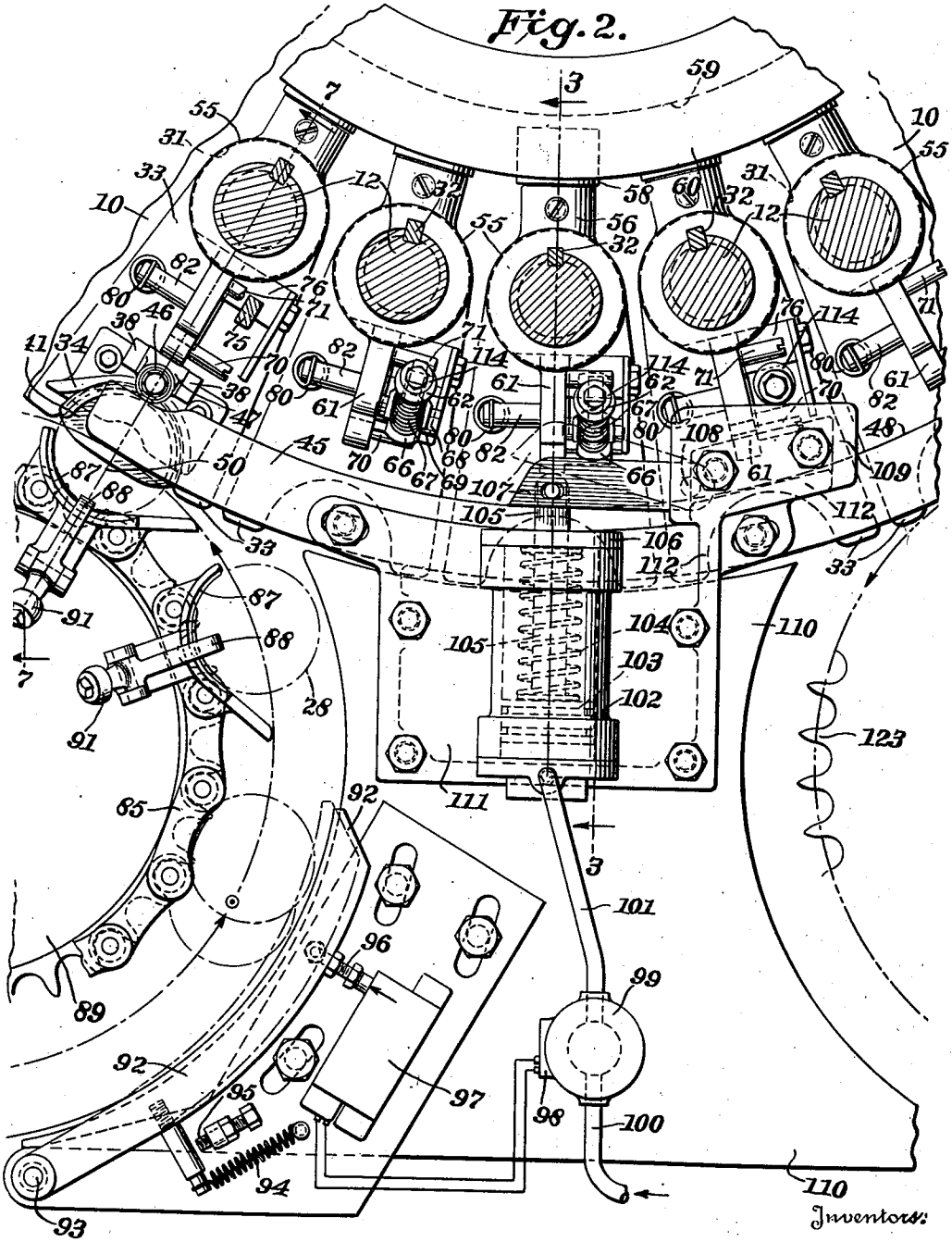
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WAX COATING MACHINE

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Fig. 2.



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WAX COATING MACHINE

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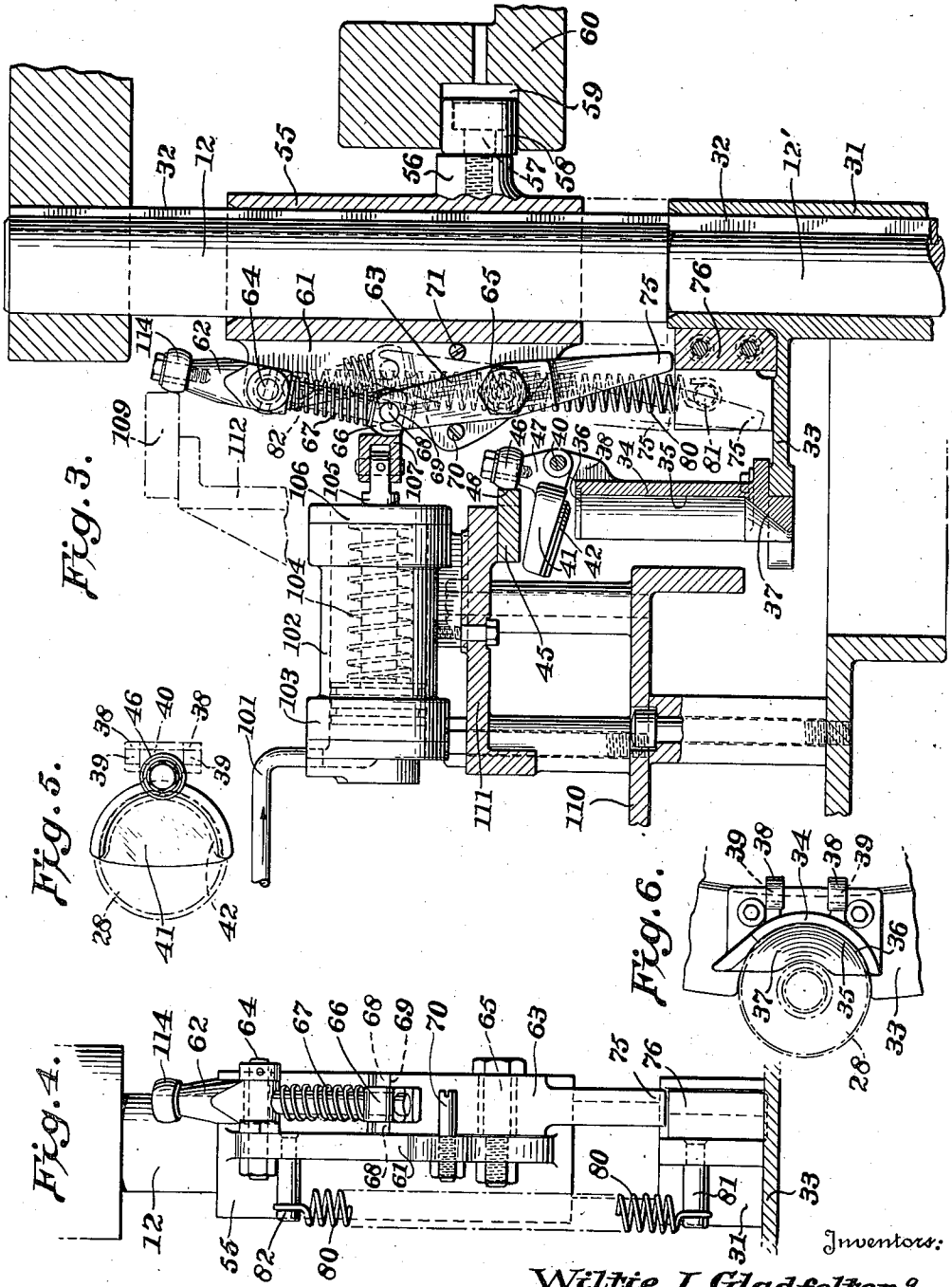


Fig. 3.

Fig. 5.

Fig. 6.

Fig. 4.

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WAX COATING MACHINE

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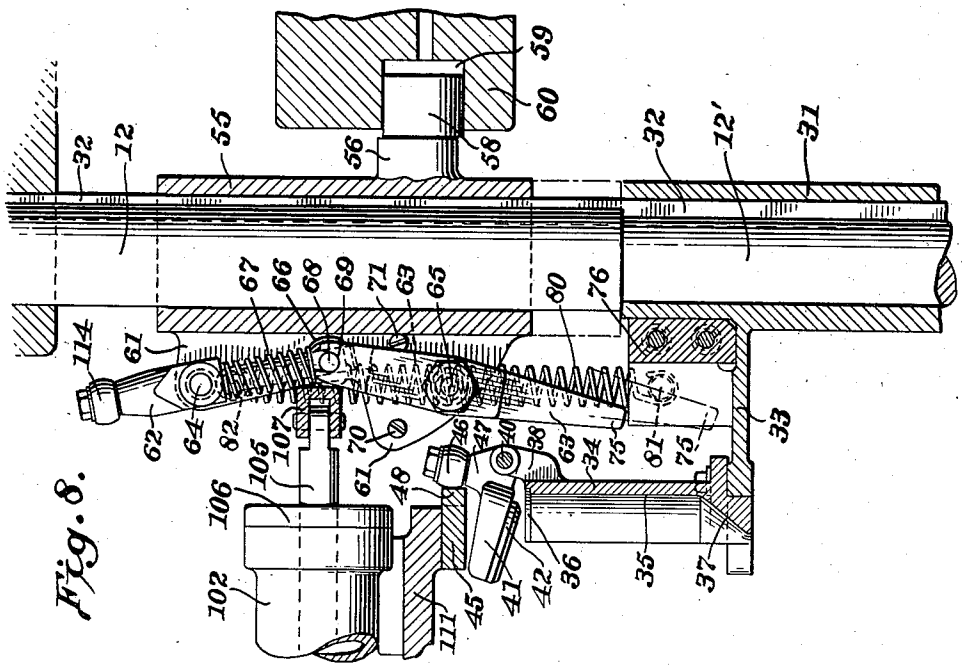


Fig. 8.

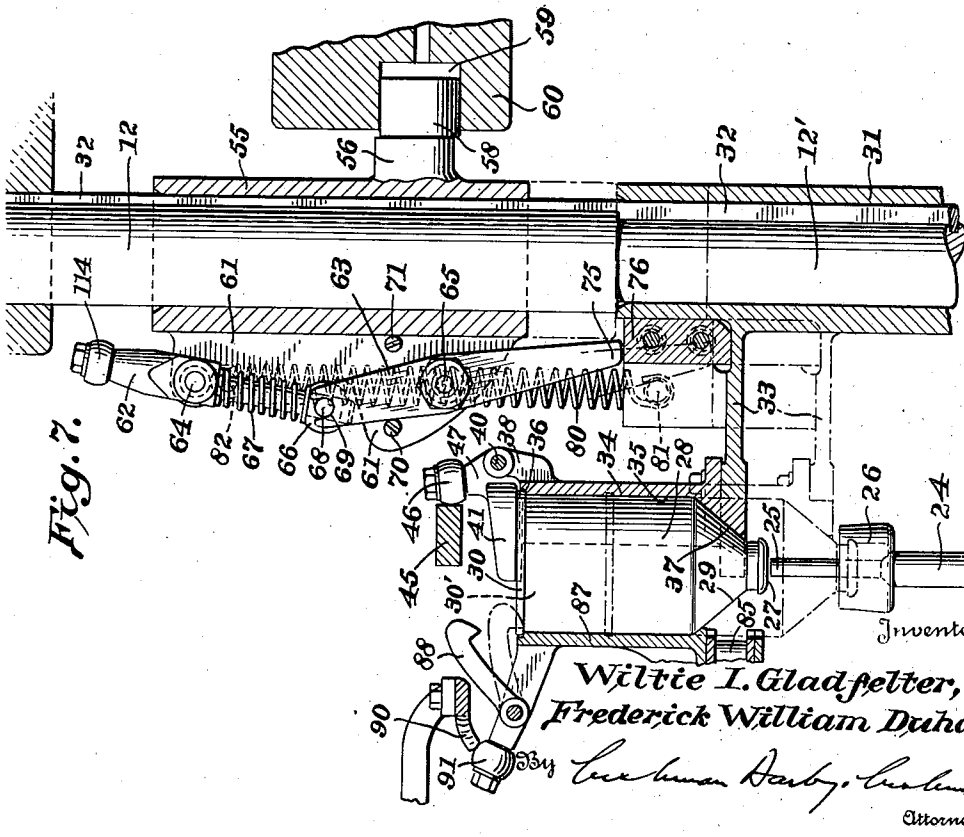


Fig. 7.

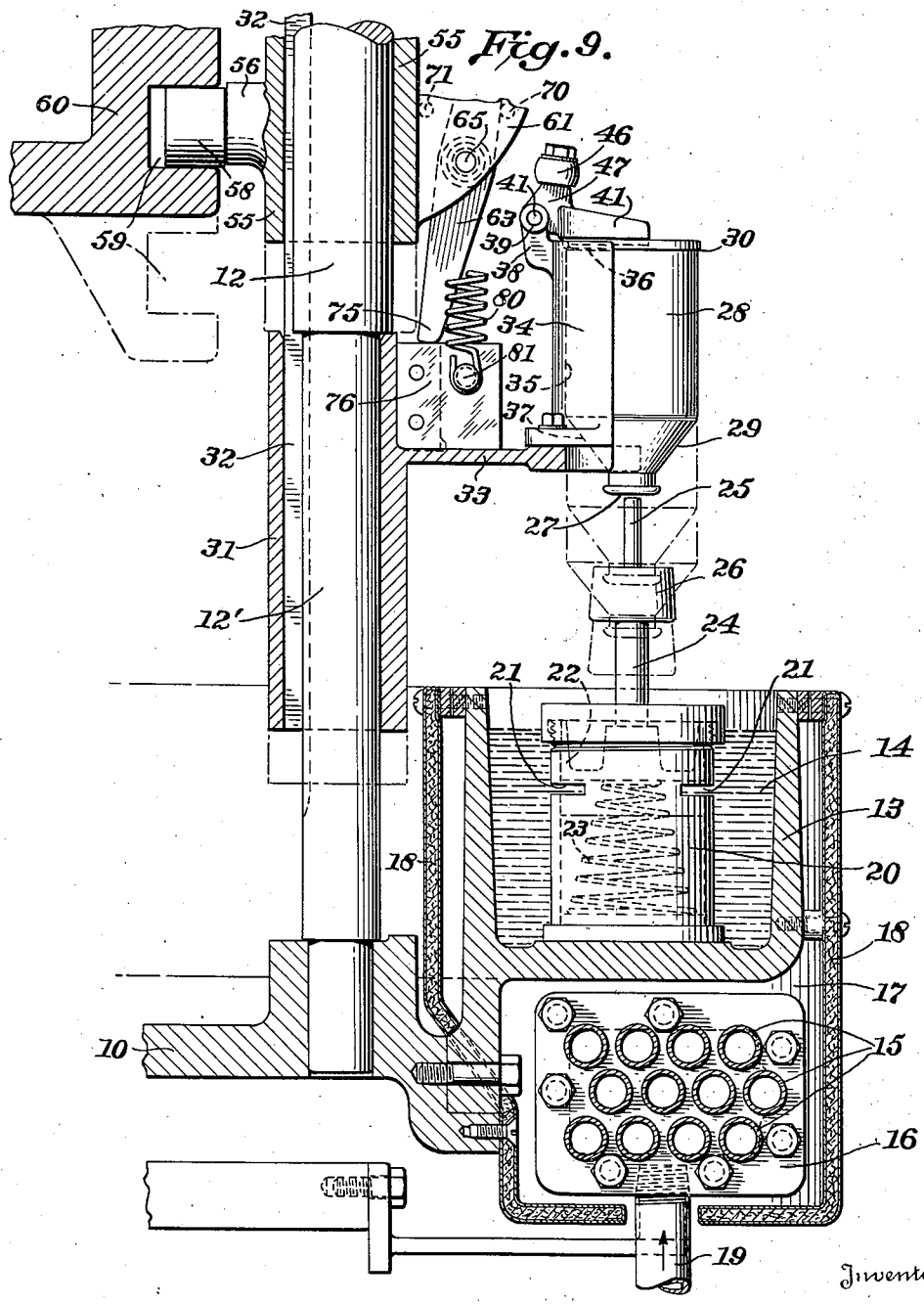
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WAX COATING MACHINE

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Fig. 9.



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2,359,838

UNITED STATES PATENT OFFICE

2,359,838

WAX COATING MACHINE

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Application July 29, 1940, Serial No. 348,306

18 Claims. (Cl. 91—44)

The present invention relates to an apparatus for coating articles; more particularly to a machine for coating the interiors of such articles as containers or cans with liquid coating materials such as wax.

The novel features of the invention relate to modifications of and improvements over the machine shown in the application of Goebel and Rau, Serial No. 151,758, filed July 2, 1937, for Method and apparatus for coating articles, now Patent 2,257,740, dated October 7, 1941.

It is an object of the present invention to provide improved means for controlling the coating instrumentalities of a coating machine of the class described.

It is a further object of the invention to provide an improved mechanism for actuating the coating or spraying devices.

Another object is to provide novel and improved means for preventing the operation of the spraying or other coating devices when no cans are present, in position to receive the coating material.

It is a further object of the invention to provide control means actuated automatically by the absence of a can to render inoperative the spraying device which normally would have operated upon that can, had it been present. To this end, the invention provides a can feeler adapted to be displaced by the absence of a can in a can holding pocket, and means controlled by such displacement to render the corresponding spray device inoperative.

It is a further object of the invention to provide novel toggle devices adapted to assume different positions to make and break the connection between the coating devices and their actuating instrumentalities, depending upon whether containers are in operative position to receive the coating material. Another object of the invention is to provide novel means for controlling the positions assumed by said toggle devices.

A further object of the invention is to provide improved can supporting chucks or assemblies, functioning to grip the cans in a novel manner and to support them in operative relation to the coating devices.

Other and further objects and advantages of the invention will be apparent to those skilled in the art from a consideration of the following description of a specific embodiment of the invention shown in the accompanying drawings, in which:

Figure 1 is a partial plan view of a machine in accordance with the invention with certain parts broken away and others omitted.

Figure 2 is an enlarged plan and horizontal section of a portion of the machine adjacent the infeed and outfeed stations.

Figure 3 is a vertical section substantially on line 3—3 of Figure 2.

Figure 4 is an elevation of the toggle mechanism shown in Figure 3, looking from the left.

Figure 5 is a detail view in plan of one of the can holding clamps forming a part of each can supporting chuck assembly.

Figure 6 is a similar view of a chuck with the clamp removed.

Figure 7 is a view similar to Figure 3, taken at the infeed station, on section line 7—7 of Figure 2.

Figure 8 is a view similar to Figure 3, showing the toggle mechanism in a different position, and

Figure 9 is a vertical section adjacent the spraying station.

As stated above, the present invention relates to modifications of and improvements on the machine shown in the application of Goebel and Rau, Serial No. 157,758, now Patent 2,257,740 issued October 7, 1941, and reference is made to that patent for a more complete disclosure of the machine as a whole, including the driving means and the like. The coating machine comprises a table 10, mounted for rotation about a vertical axis 11, and having associated therewith a plurality of vertical posts 12 upon which the can supporting assemblies hereinafter described are mounted for vertical sliding movement. The table supports an annular trough 13 for a supply of liquid wax 14 or other lining material. The wax is maintained in heated, liquid condition by a plurality of steam pipes 15 connected to headers 16 disposed in a chamber 17 below the trough 13 and defined by walls 18 of sheet metal with a layer of asbestos or other suitable heat insulated material interposed therebetween, steam being admitted to the headers by appropriate pipes 19. Preferably, four headers 16 are provided and the heating pipes, connected at their opposite ends thereto, extend substantially half-way around the table below the trough.

As shown in Figure 9, a sprayer assembly is provided opposite each vertical post 12. Each assembly is substantially identical to that shown and described in detail in the aforementioned application and comprises a cylinder 20 having inlet openings 21 in its side wall, a piston 22, a spring 23 urging the piston upwardly, and

an upwardly projecting discharge pipe 24 carried by the piston and having a reduced end 25 and a collar 26 secured thereto by a spider or the like, in the manner shown in Figure 8 of the aforesaid application. The nozzle 25 is adapted to enter the open mouth 27 of a cylindrical container 28 having a conical neck 29 and a bottom end member secured thereto by a double-seam 30, the container being supported for vertical movement relative to the spray device as hereinafter described. Of course, any other type of article may be coated by the present machine, and the invention is not confined to use with cans of the type shown herein. It will be understood that, as the piston 22 is depressed below the side openings 21, the liquid wax in the cylinder 20 will be forced upwardly through the discharge pipe 24 and nozzle 25 in the form of a solid stream or spray with substantial force.

Referring to Figures 3, 7, 8 and 9, each shaft 12 has a lower section 12' of reduced diameter, upon which a sleeve 31 is slidably mounted, the sleeve being restrained against rotation with respect thereto by a key 32 disposed in appropriate keyways. Each sleeve 31 carries an outwardly projecting, horizontal bracket arm 33 upon which a can receiving chuck member 34 is secured, the chuck having a vertically disposed arcuate side wall 35 terminating at its upper end in a recess or shoulder 36 and at its lower end in a frusto-conical surface 37. At its upper end the chuck member is provided with a pair of upwardly projecting lugs 38 having horizontal bores 39, therein adapted to receive a transverse pin 40, upon which a clamp 41 is pivoted for swinging movement in a vertical plane, the undersurface of the clamp being provided with a downwardly projecting arcuate surface 42 adapted to enter the end cavity 30' defined by the double-seam 30 of the container 28, to clamp the double-seam against the shoulder 36 of the chuck member 34. As indicated in Figures 7 and 9, the conical neck 29 of the container engages the frusto-conical surface 37 of the chuck, while the cylindrical side wall of the can engages the arcuate surface 35. The clamp 41 is relatively heavy and has sufficient mass to swing downwardly under the influence of gravity to clamp the containers in place, as shown in Figure 7. Of course, a spring or the like may be used to assist in performing this function, if desired. A stationary cam track 45 is positioned adjacent the path of movement of the chuck assemblies opposite a cam following roller 46, carried by an upwardly projecting post 47, integral with the clamp 41, the cam having a lift 48 therein to swing the clamp 41 upwardly at the discharge position 49, as shown in Figures 1 and 8, and to maintain the clamp in that position until the infeed position 50 is reached, whereupon the clamp snaps downwardly to engage the double-seam of the container placed in the chuck by the infeed device, hereinafter described.

Each vertical shaft 12, above the reduced portion 121, carries a second vertically slidable sleeve 55, restrained against rotation by a suitable key, which may be a continuation of the key 32. Each sleeve 55 has an inwardly projecting boss 56 carrying a pin 57, upon which a cam following roller 58 is journalled, the roller being disposed in a groove 59 of a stationary cam 60. The cam has a profile similar to that shown in Figure 4 of the aforesaid copending application and serves to raise and lower the sleeve 55 once during each rotation of the table 10.

Novel means are provided for transmitting vertical reciprocations from the sleeve 55 to the sleeve 31, to cause the lower end of the chuck assembly to move downwardly and engage the collar 26 of the associated spray mechanism, thereby to depress the piston 22 and cause the same to project a stream of wax upwardly through the nozzle 25. The sleeve 55 carries an outwardly projecting web 61 which supports the upper lever 62 and the lower lever 63 of a toggle mechanism, pivotally mounted on pins 64, 65, respectively. A collar 66, slidable on the lower end of the upper toggle lever 62 and urged downwardly by a coil compression spring 67, has laterally projecting trunnions 68 disposed in sockets 69 formed at the upper end of the lower lever 63. Stop pins 70, 71, carried by the web 61, limit the swinging movement of the toggle levers in both directions under the influence of the compression spring 67. When in the position shown in Figures 3, 7 and 9, the lower end 75 of the lower toggle lever 63 is disposed above a block 76 carried by the bracket arm 33 of the lower sleeve 31. Hence, as the upper sleeve 55 is depressed under the influence of the cam roller 58 and cam groove 59 during rotation of the table, motion is transmitted through the toggle mechanism to the block 76 to depress the sleeve 31 and the can supporting chuck assembly which, in turn, engages the collar 26 of the spray device, forces the piston downwardly and causes a stream of liquid wax to be projected upwardly into the interior of the can to coat the inner surface thereof. When the sleeve 55 is raised by the cam 60, the can supporting chuck assembly and associated parts are raised therewith by means of a tension spring 80 connected at its lower end to a pin 81 carried by the block 76 and at its upper end to a pin 82 projected laterally from the web 61, the upward movement of the sleeve 31 in all cases being limited by the shoulder at the upper end of the reduced shaft portion 12'.

When the toggle mechanism is in its other position, with the lower end 75 projected outwardly to clear the block 76, the sleeve 55 is free to reciprocate vertically without imparting movement to the lower chuck supporting sleeve 31, the connection between the two sleeves being broken, as shown in Figure 8 and in dotted lines in Figure 3.

Means are provided for shifting the toggle mechanism to the last-mentioned position in the event that no can is present in the associated chuck assembly. If means were not provided for breaking the connection between the upper and lower sleeves under these circumstances, the spray devices would be operated in the same manner as though a can were present, and liquid wax would be projected indiscriminately over various elements of the machine.

In the embodiment of the invention illustrated in the accompanying drawings, the containers 28 are delivered to the table of the coating machine by a conveyor chain 85 (Figs. 1, 2 and 7) which moves them in a line through a preheating oven 86, where the temperature of the cans is raised to a degree suitable to receive the hot liquid wax. The chain 85 has a plurality of can holders 87 thereon, adapted to carry the cans 28 in inverted position, the bottom double-seams of the cans being gripped by appropriate clamps 88, represented diagrammatically in the drawings. Since the specific structure of the conveyor chain and can holders is not a part of the invention claimed in this application, they will not be described in detail. Preferably, a chain and

can holders of the type shown in the application of Gladfelter and Schmidt, Serial No. 350,976, filed Aug. 3, 1940, are employed. Moreover, it must be understood that in place of a conveyor chain for delivering the articles to the table, any appropriate device may be used, such as an infeed dial.

The conveyor chain **85** is trained about a sprocket **89**, journalled for rotation adjacent the table. As each holder **88** reaches the infeed transfer position **50**, opposite the corresponding chuck on the table, the clamp **88** (Fig. 7) or its equivalent is raised to the release position by a stationary cam **90**, engaging a cam following roller **91** associated with the clamp. Simultaneously, the clamp **41** of the table chuck drops downwardly to grip the double-seam on the can and to hold the same in the position shown in Figures 7 and 9. The cans then move around with the table and are coated as previously described.

Adjacent the path of movement of the cans carried by the conveyor chain holders, there is a can feeler **92**, pivoted at **93** and urged outwardly against the cans by a tension spring **94**, a stop **95** being provided to limit the displacement of the feeler if a can is not present in one of the chain holders. The displacement of the feeler moves an operating shaft **96** connected to an electric switch **97** to close a circuit and thereby actuate a solenoid **98** which opens an air valve **99**. The valve delivers compressed air from a pipe **100** to a pipe **101** leading to an air cylinder **102** having a piston **103** therein, the piston being normally held in retracted position by a coil compression spring **104** surrounding the piston rod **105** and bearing against a head **106** at the other end of the cylinder. The piston rod **105** is connected at its end to a movable cam link **107** pivotally mounted at **108**.

As indicated in Figures 1, 2 and 3, a stationary table **110**, positioned between the infeed and outfeed sprockets, supports a raised bracket **111** upon which the air cylinder **102** and the associated parts are mounted. An upwardly projecting flange **112** associated with the bracket carries a fixed cam **109**, disposed at an elevation opposite a cam following roller **114** journalled on the upper end of the upper lever **62** of the toggle mechanism, the cam having a face positioned to move the upper end of the lever radially inwardly, or toward the right in Figure 3 to the position shown in full lines therein. Thus, as the table rotates in a clockwise direction (Figs. 1 and 2) past the cam **109**, each toggle mechanism will be caused to assume the normal operative position. The movable cam **107**, however, if in its operative, outwardly projected position, will engage the collars **66** carried by the lower end of the upper levers **62** of the toggle mechanisms, and the toggles will be thrown, by the continued rotation of the table, from the normal operative position to the inoperative position, shown in Figure 8.

The cam **107** is projected to its operative position only when conditions are such that the chuck assemblies on the table will not receive cans at the infeed position from the holders **87** associated with the infeed chain **85**. As each holder **87** approaches the operative end of the feeler **95**, the chuck on the table which normally would receive a can from that holder approaches the movable cam **107**. If no can is present in the particular holder on the infeed chain, the feeler **92** will move inwardly, to the dotted line position in Figure 2. Immediately, the switch **97** will complete the circuit to actuate the solenoid **98** and open the valve **99**, thereby admitting compressed air to the cylinder **102** behind the piston **103** and projecting the movable cam **107** into the path of movement of the on-coming toggle mechanism associated with the aforesaid chuck, whereupon the toggle mechanism will be shifted to the inoperative position, as shown in Figure 8. As long as no cans are present in the succeeding infeed chain holders, the cam **107** will remain in its projected position and all succeeding toggle mechanisms will be shifted thereby to the inoperative position. As the toggles in that position approach the fixed cam **109**, at substantially the end of a complete revolution of the table, they will be automatically shifted back to the operative position and will remain in that position unless the cam **107** is in its projected position to again shift them back to the inoperative position. As soon as a can in a can holder **87** engages the can feeler **92** and swings it rearwardly, the switch **97** is opened to break the circuit to the solenoid operated air valve, whereupon the supply of compressed air to the cylinder **102** is cut off and the cam **107** withdrawn by the spring **104**, the exhaust of air from the cylinder being permitted by an exhaust vent in the valve in a well known manner. Hence, the on-coming toggle mechanism will be left in the operative position, to which it was shifted by the cam **109**.

It will be understood that, when the apparatus is running in the normal manner with a continuous line of containers present in the holders of the infeed conveyor chain, the feeler **92** will be continuously maintained in its retracted position, the air valve **99** will be closed and the cam **107** withdrawn. Therefore, the toggles will remain in their operative position, as shown in Figure 3, and the cam **109** will be inoperative, since the rollers **114** will remain in their innermost position.

The coated cans are transferred at the discharge station **49** to holders **120** associated with an outfeed chain **121** leading the cans in inverted position to and through a wax drain oven shown diagrammatically at **122**, the chain being trained about an outfeed sprocket **123**. The holders **120** on the chain **122** may be generally similar to the holders **87** associated with the infeed conveyor and preferably are in accordance with the disclosure of the aforesaid application of Gladfelter and Schmidt, Serial No. 350,976, filed Aug. 3, 1940. At the discharge position, the cam **48** engages the rollers **46** associated with the bottom seam engaging clamps **41** and raises them to the release position, as shown in Figure 3, whereupon the cans may be grasped by the holders on the outfeed chain and moved to the wax drain oven.

It is thought that the entire operation of the machine will be clearly apparent to one skilled in the art from the foregoing description of the structure and operation of the various instrumentalities shown in the accompanying drawings. Reference is made to the aforementioned copending application of Goebel and Rau for a disclosure of all parts of the machine not completely shown herein and described above.

It must be understood that the invention is not limited to the details of construction described herein and shown in the accompanying drawings, but covers all modifications coming within the scope of the appended claims and their equivalents.

We claim:

1. An apparatus for coating cans comprising a rotatable table, a plurality of can holders supported for rotation with the table, a coating material projecting sprayer associated with each holder and movable therewith through a spraying zone, a shiftable actuating member for normally operating each sprayer as the same passes through said zone, and cam means for shifting the actuating member to an inoperative position when the associated holder, prior to its passage through the spraying zone is empty, whereby the sprayer is not operated when the holder is empty.

2. An apparatus for coating cans comprising a rotatable table, a plurality of can holders mounted for rotation with the table, a piston actuated can sprayer assembly associated with each holder and movable therewith through a spraying zone, a member associated with each holder and mounted for movement from a normal piston operating position to an abnormal inoperative position, a can feeler positioned in operative relation to the holders ahead of the spraying zone, and means controlled by said feeler for moving said member to the abnormal, inoperative position when an empty holder approaches the spraying zone, thereby to render the associated sprayer assembly inoperative.

3. An apparatus for coating cans comprising a rotatable table, a plurality of vertically movable can holders mounted for rotation with the table, a can sprayer including a vertically movable piston associated with each holder and movable therewith through a spraying zone, a vertically reciprocating member associated with each holder and mounted for lateral movement between a normal operative position to depress the holder and establish spraying connection between each sprayer and the can in the corresponding holder, and an abnormal inoperative position preventing such depression of the holder, a can feeler positioned in operative relation to the holders ahead of the spraying zone, and means controlled by said feeler for moving said member to the latter position when an empty can holder approaches the spraying zone.

4. An apparatus for coating cans comprising a rotatable table, a plurality of can holders mounted for rotation with the table, a can sprayer associated with each holder and movable therewith through a spraying zone, an infeed device having pockets therein for delivering cans to the holders, a shiftable actuating member associated with each holder and sprayer and mounted for movement between an inoperative position and a position operative to actuate each sprayer to coat a can in the corresponding holder, a can feeler associated with said infeed device, and means controlled by the feeler to move each member to an inoperative position when the corresponding pocket in the infeed device is empty.

5. An apparatus for coating cans and the like comprising an infeed device having a plurality of can holding pockets associated therewith, a plurality of movably mounted can holding chucks, each adapted to receive a can from one of said pockets, a can sprayer movable with each chuck through a spraying zone, means for actuating each sprayer, a can feeler asociated with the infeed device, means for displacing the feeler when an empty pocket is presented thereto, and means actuated by the displacement of the feeler for rendering inoperative the actuating means for the particular sprayer which is movable with the chuck normally adapted to receive a can from the last-mentioned pocket.

6. An apparatus for coating the interiors of cans and the like comprising a rotatable table, a plurality of vertically movable can holding assemblies carried by the table, an upwardly directed, vertically movable spray nozzle below each assembly, means for projecting a spray of coating material upwardly through each nozzle when the same is moved downwardly to an operative position, a vertically movable member associated with each can holding assembly, means for lowering each of said members means for establishing operative connection between each member and the associated nozzle to cause the nozzles to move downwardly with the members to said operative position, a can feeler, and means controlled thereby for rendering said connecting means inoperative if the associated assembly is empty.

7. An apparatus for coating the interiors of cans and the like comprising a rotatable table, a plurality of vertically movable, can holding brackets thereon, an upwardly directed spray nozzle below each bracket and adapted to be depressed to a spraying position upon downward movement of the bracket, a vertically movable member associated with each bracket, means actuated by the rotation of the table for reciprocating the member, means for establishing connection between each member and the associated bracket to cause the latter to be depressed upon downward movement of the member, thereby to depress the spray nozzle to spraying position a can feeler, and means controlled thereby for rendering said connecting means inoperative when no can is present in the associated bracket.

8. An apparatus for coating the interiors of cans and the like comprising an infeed device having a plurality of can holding pockets associated therewith, a rotatable table, a plurality of vertically movable brackets thereon, a can holding chuck carried by each bracket and each adapted to receive a can from one of said pockets, an upwardly directed sprayer below each bracket and adapted to be depressed to a spraying position upon downward movement of the bracket, a stationary cam, cam following means associated with each bracket and adapted to be reciprocated by said cam, means for establishing connection between each cam following means and its bracket to transmit movement from the cam follower to the bracket and to depress the sprayer to said spraying position, a can feeler, and means controlled thereby for rendering the connecting means inoperative when the associated chuck is empty.

9. An apparatus for coating the interiors of cans and the like comprising a rotatable table, a plurality of vertically slidable can holding brackets thereon, an upwardly directed spray nozzle below each bracket and adapted to be depressed to a spraying position upon downward movement thereof, a vertically reciprocable member associated with each bracket, means actuated by the rotation of the table for reciprocating each member, a pivoted lever adapted in one position to establish connection between the member and the bracket to depress the latter upon downward movement of the member, and means for shifting the lever to an inoperative position when the associated chuck is empty.

10. An apparatus for coating the interiors of cans and the like comprising a rotatable table, a plurality of vertically slidable can holding brackets thereon, an upwardly directed spray

nozzle below each bracket and adapted to be depressed to a spraying position upon downward movement of the bracket, a vertically slidable member associated with each bracket, means actuated by the rotation of the table for reciprocating each member, a two-position toggle mechanism adapted in one position to make connection between each member and the associated bracket and in the other position to break said connection and enable the member to reciprocate independently of the bracket, and means for moving each toggle mechanism to the last-mentioned position when the associated can holding bracket is empty.

11. An apparatus for coating the interiors of cans and the like comprising a rotatable table, a plurality of vertically slidable, can holding brackets thereon, an upwardly directed spray nozzle below each bracket and adapted to be depressed to a spraying position upon downward movement of the bracket, a vertically slidable member associated with each bracket, means actuated by the rotation of the table for reciprocating each member, a two-position toggle mechanism adapted in one position to make connection between each member and the associated bracket and in the other position to break said connection and to enable the member to reciprocate independently of the bracket, means for moving the toggle mechanisms to the last-mentioned position when the associated can holding brackets are empty, said means comprising a can feeler, means for displacing the feeler when no cans are presented thereto, a movable cam, and means controlled by the displacement of said feeler for projecting the cam into the path of movement of the toggle mechanisms to shift the same to inoperative position.

12. An apparatus for coating the interiors of cans comprising a rotatable table, vertically movable can holding assemblies on the table, upwardly directed spray nozzles below the assemblies positioned to be depressed to operative, spraying position upon downward movement of the associated assemblies, vertically reciprocating members associated with each assembly, toggle devices carried by the members and movable from an inoperative position to a position making connection between the reciprocating members and the assemblies to cause the latter to be depressed with the former, a stationary cam in the path of movement of the toggles and positioned to shift the toggles from the inoperative to the operative position, a movable cam behind the stationary cam, and means for projecting the movable cam into the path of movement of the toggles to shift the same from the operative to the inoperative position if no cans are present to be coated.

13. An apparatus for coating the interiors of cans comprising an infeed device having a plurality of can holding pockets associated therewith, a rotatable table, a plurality of vertically movable can holding assemblies carried by the table and each adapted to receive a can from one of said pockets, an upwardly directed sprayer below each assembly adapted to be depressed to a spraying position upon downward movement of the associated assembly, a vertically reciprocating member above each assembly, a toggle mechanism for each member and assembly, stationary cam means for shifting the toggle to one position establishing connection between the associated member and assembly, a movably mounted cam, and means for projecting the same into the path of movement of the toggles to shift the toggles from said one position to an inoperative position, said means comprising a can feeler associated with said infeed device, means for displacing the same when an empty pocket is presented thereto, and means controlled by the displacement of the feeler for projecting the movable cam into the path of movement of the toggle associated with the assembly normally adapted to receive a can from the last-mentioned pocket.

14. An apparatus for coating the interiors of cans comprising an infeed device having a plurality of can holding pockets associated therewith, a rotatable table, a plurality of vertically movable can holding assemblies carried by the table and each adapted to receive a can from one of said pockets, an upwardly directed sprayer below each assembly adapted to be depressed to a spraying position upon downward movement of the associated assembly, a vertically reciprocating member above each assembly, a toggle mechanism for each member and assembly, stationary cam means for shifting the toggle to one position establishing connection between the associated member and assembly, a movably mounted cam, and means for projecting the same into the path of movement of the toggles to shift the toggles from said one position to an inoperative position, said means comprising a can feeler associated with said infeed device, means for displacing the same when an empty pocket is presented thereto, an air piston connected to the movable cam, and means controlled by the displacement of the feeler for delivering actuating air to the piston.

15. An apparatus for coating the interiors of cans comprising an infeed device having a plurality of can holding pockets associated therewith, a rotatable table, a plurality of vertically movable can holding assemblies carried by the table and each adapted to receive a can from one of said pockets, an upwardly directed sprayer below each assembly adapted to be depressed to a spraying position upon downward movement of the associated assembly, a vertically reciprocating member above each assembly, a toggle mechanism for each member and assembly, stationary cam means for shifting the toggle to one position establishing connection between the associated member and assembly, a movably mounted cam, and means for projecting the same into the path of movement of the toggles to shift the toggles from said one position to an inoperative position, said means comprising a can feeler associated with said infeed device, means for displacing the same when an empty pocket is presented thereto, an air cylinder, a piston in the cylinder connected to said movable cam, a solenoid-operated valve adapted to deliver compressed air to said cylinder, and a switch controlled by the displacement of the feeler for actuating the solenoid-operated air valve.

16. In combination, an endless conveyor chain having a plurality of can holders carried thereby, a wax coating machine and control means therefor, said machine comprising a plurality of can supporting chucks adapted to receive cans from the holders, a reservoir for heated wax, and wax spray nozzles associated with the chucks, said control means comprising a can feeler disposed adjacent the chain opposite the can holders, means for displacing the feeler when empty holders are presented thereto, and means actuated by the displacement of the feeler for rendering inoperative the nozzles associated with the chucks which normally would receive cans from the empty holders.

17. In combination, an endless chain trained for movement along a horizontal path, a plurality of can holding brackets on the chain adapted to support cans in inverted position, a machine for coating the interiors of the cans with hot liquid wax, said machine comprising a plurality of can supporting chucks adapted to receive cans from the can-holding brackets on the chain and to support the same in inverted, neck-down position and a wax spray nozzle below each chuck, and control means for said nozzles for rendering the nozzles inoperative when the can holding brackets on the chain are empty and no cans are transferred thereby to the chucks, the last-mentioned means comprising a can feeler adjacent the chain in advance of the point of transfer of cans to the chucks, means for displacing the feeler when an empty bracket is presented thereto, and means actuated by the displacement thereof for rendering inoperative the nozzle associated with the chuck that normally would have received a can from the empty bracket.

18. An apparatus for coating articles, comprising a plurality of article holders mounted for movement along a predetermined path, a coating material projecting sprayer associated with each holder and movable therewith through an article spraying zone, an actuating member operatively associated with each sprayer for movement along said path therewith, said member being shiftable to an operative position and to an inoperative position and adapted in the former position to actuate the associated sprayer as the holder and the sprayer move together through the spraying zone, an article feeler positioned in operative relation to the holders ahead of the spraying zone, and means controlled by said feeler for shifting said actuating member from said operative position to said inoperative position before the sprayer and an empty holder move into the spraying zone.

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