

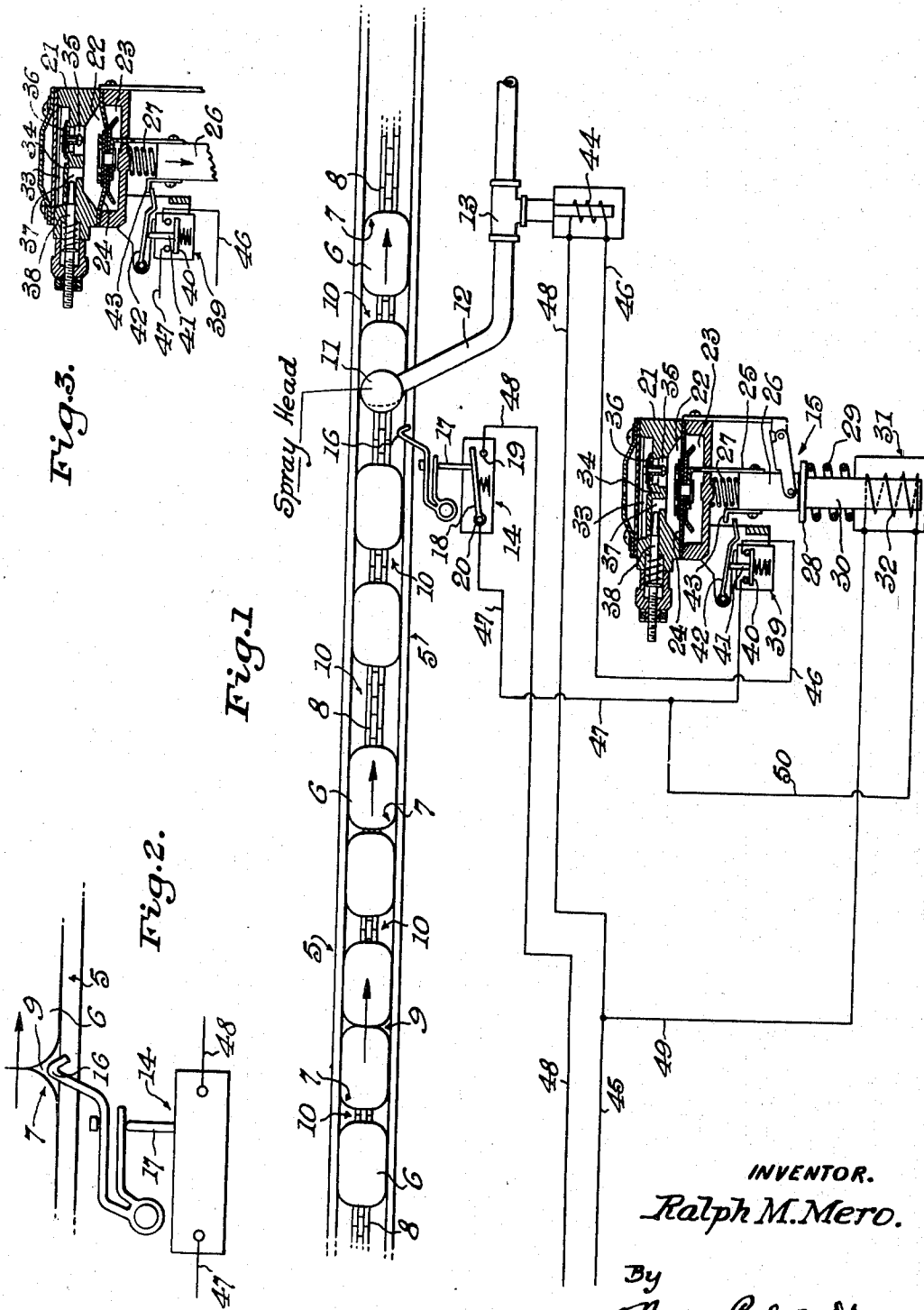
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LARD SPRAY CONTROLLING MEANS

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LARD SPRAY CONTROLLING MEANS

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The invention relates generally to spray controlling means and primarily seeks to provide novel means for controlling the spraying of lard, or the like, in to cans being fed in processional order to a filling station whereat meat or other products are to be filled thereinto.

When it is desired to fill meat into cans it is customary to spray lard into the cans prior to the filling thereof in order to prevent the meat from sticking to the cans when being removed by consumers. Spraying systems automatically controlled so as to prevent operation of the spray head when no can is in position to be sprayed have been provided, but in such systems of which I am aware, no provision has been made to assure against continuous and obviously objectionable operation of the spraying head when conveying means on which the cans are carried is stopped with the control devices in condition for continuing the spraying operation. Therefore, it is an object of the present invention to provide in combination with means for feeding cans in processional order and means for spraying lard or other fluid substances into such cans, novel means for controlling the spraying operation and effective to stop the spraying operation in the event that the feeding means stops with a can presented in position for receiving spray from the spray head.

In its more detailed nature the invention resides in providing in combination with can feeding and lard or other substance spraying means of the character stated, a solenoid valve for controlling the spraying means, a solenoid controlling circuit and a control switch connected in said circuit and disposed to be actuated by can contact for causing the valve to open while a can is passing the spraying means, and a timing relay unit connected in said circuit and normally operable to maintain the valve open control condition, subject to said control switch, and operable in the event that the can feeding means stops with a can in contact with said control switch to break said circuit and prevent continuous spraying into the can stationary opposite said spraying means.

Another object of the invention is to provide in control apparatus of the character stated a timing relay unit including a switch which is normally closed and connected in series with a coil of the solenoid valve and the normally open can contact closed switch, and means for causing the timing relay unit switch to open each time a normally recurring opening of the can contact closed switch is delayed a predetermined amount over and above the normal interval of spraying of an individual can.

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With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims, and the view illustrated in the accompanying drawing.

In the drawing:

Figure 1 illustrates diagrammatically means for feeding cans in processional order, means for spraying a fluid substance into the passing cans, and the novel control device comprising the invention.

Figure 2 is an enlarged fragmentary view showing the can engaging element projected into the space provided between rounded corners on two cans being fed in end abutting relation.

Figure 3 is a fragmentary view illustrating the diaphragm attached block lowered to the position in which it causes the actuator to open the normally closed switch of the timing relay unit.

In the diagrammatic illustration herein made of one example of embodiment of the invention, 5 designates a feedway over which cans 6 having rounded corners 7 are fed in processional order and at random spacing by any suitable conveying or feeding means such as the block chain 8. In such processional, random feeding some cans may abut and have only the spaces between them provided by the adjacent rounded corners, as at 9, or they may have short or long spaces therebetween as indicated at 10 in Figure 1.

While being fed along in the manner stated by the feeding means 8, the cans pass under a spray head 11 and have fluid substance sprayed thereinto. While the invention is adapted for more general uses, it is particularly adaptable to use in controlling the spraying of lard into cans which are to be filled with meat. The feeding means referred to may form part of a filling machine, a feed line for feeding cans toward a filling mechanism, or toward a hand filling station, or the control devices may be combined with a feeding means for cans to be sprayed for other reasons.

The spray head diagrammatically indicated at 11 is fed through a duct 12 and controlled by a solenoid valve 13. The valve is automatically controlled to spray the fluid substance when a can is passing therebeneath, and in the event that operation of the can feeding means 8 should be discontinued so as to bring a can to rest beneath the operating spray head, means is provided for automatically discontinuing the spray after a predetermined interval of time.

The novel control means comprises the solenoid valve 13, a normally open feather switch gener-

ally designated 14 and which is disposed in the manner illustrated in the drawing for being actuated by passing cans, and a timing relay unit generally designated 15.

The can actuated switch 14 includes an element 16 engageable by passing cans, and means 17 actuated by said element each time it is engaged by a passing can for placing the contact maker 18 across the switch contacts 19 and 20.

The timing relay unit may be of any approved type and in the present disclosure includes a housing 21 divided into an upper chamber 22 and a lower chamber 23 by a diaphragm 24. The diaphragm is connected as at 25 to a block 26 which is constantly urged by a spring 27 in a direction for lowering the diaphragm 24. The block is normally held against said diaphragm lowering movement by a support member 28 which will be normally held in its block supporting position by a spring 29, but which may be displaced against the action of the spring 29 by attraction of the core 30 of the solenoid 31 incidental to the energizing of the coil 32 of said solenoid.

The housing includes a second upper chamber 33 which is separated from the firstmentioned upper chamber 22 by a partition wall 34. The partition wall has a rapid flow passage 35 therethrough which is normally closed by a check valve 36, and said wall also has a bypass 37 restricted by an adjustably mounted tapered pin 38.

The timing relay unit also includes a normally closed switch generally designated 39, the contacts of which are normally bridged by a contactor 40 having a projected displacer button 41 which is engaged by a pivotally mounted actuator 42. The free end of the actuator 42 is disposed to be engageable by a depressor 43 carried by the block 26 so that whenever the block 26 is permitted to move the diaphragm 24 downwardly a predetermined distance, the actuator 42 will be depressed and the contactor 40 will be moved away from the contacts in the switch 39, as shown in Figure 3.

The coil 44 in the solenoid valve 13 is connected with a current source line 45, and also as at 46 with one contact of the timing relay unit switch 39. The other contact of said switch 39 is connected as at 47 with the contact 20 of the can actuated switch 14. The other contact 19 of said switch 14 is connected with the other current source line 48. It will also be observed that the coil 32 of the timing relay unit 31 is connected as at 49 with the current source line 45, and as at 50 with the line connecting the contact 20 of the can engaged switch with one contact of the timing relay switch 39.

It will be apparent that since the normally closed switch 39 of the timing relay unit, the coil 44 of the solenoid valve 13 and the normally open can actuated switch 14 are connected in series with the current supply lines 45 and 48, each time the element 16 of the switch 14 is displaced by a passing can it will close the switch 14 and hold the same closed until the can passes out of contact with said element 16. This will serve to energize the coil 44 of the solenoid valve 13 and the valve will be opened and the spray head 11 caused to spray the fluid substance into the passing can. As soon as the can being sprayed moves out of contact with the element 16, the spraying operation will be discontinued. This functioning of the apparatus will continue so long as the cans continue to be fed along in processional order in the manner diagrammatically illustrated in the Figure 1 of the drawing.

It is to be understood that each time the can actuated switch 14 is closed by bridging of its contacts 19 and 20, the coil 32 of the solenoid 31 of the timing relay unit will be energized and the core 30 will be retracted to displace the support 28 from beneath the block 26. As the spring 27 pushes the block 26 downwardly, said block will draw the diaphragm 24 downwardly from its normally, elevated position, but by reason of the fact that the fluid in the top chamber 33 of the housing 21 must bleed into the upper chamber 22 past the pin 38, the downward movement of the block and the diaphragm are retarded, and as long as the cans continue to be fed in immediate or close succession, the block 26 will never be permitted to move down far enough to engage the actuator member 42 and effect an opening of the timing relay unit switch 39. Under normal operation, as the switch element 16 moves off the trailing end of a can to permit the switch 14 to open and discontinue a spraying operation and also de-energize the coil 32 of the timing relay unit solenoid 31, the spring 29 will lift the support 28 and the block 26 and the connected diaphragm 24 and the fluid in the upper chamber 22 will be rapidly forced through the check valve 36 into the top chamber 33.

Should the feed stop so as to place a can beneath the spray head 11 and in position for holding the switch 14 in the circuit closed position which will ordinarily cause an objectionable, continuous operation of the spray head, the control devices function to discontinue the spraying operation after a predetermined interval determined by the adjustment of the tapered pin 38. In this emergency, the block 26 will be permitted to move downwardly a distance sufficient to contact the actuator 42 and displace the contactor 40 of the time relay unit switch 39, thereby breaking the circuit through the coil 44 of the solenoid valve 13 and discontinuing the spraying operation. So long as the can actuated switch 14 remains in the closed position, the coil 32 of the timing relay unit 31 will remain energized and the switch 39 of said unit will not be restored to its normal closed position. As soon as the normal feeding of the cans is resumed, however, the switch 14 will be opened and the system will be restored to normal operation.

It will be apparent by reference to Figure 2 of the drawings how the element 16 will move into the space 9 between cans provided by the rounded corners 7 of cans even though they be fed along in end abutting relation. This permits the end 16 of the contact lever to swing outwardly and break the circuit across the contacts 19 and 20 for a short interval of time, thus restoring the timing relay 15 to its original position shown in Figure 1. Thus should some can groups be advanced in a solid stream, or in other words in end abutting relation, as shown in one portion of Figure 1, the element 16 would move into each space 9 and momentarily break the circuit across said contacts 19 and 20 and in consequence, the action of the block 26 of the timing relay would be of a pulsating nature, traveling slightly downward incidental to each engagement of the element 16 in a space 9 and then being pushed back up into its original position by the spring 29 lifting the core 30 after the current has been broken in the solenoid coil 32. On the other hand, should the cans pass along with greater spaces between the ends thereof, as shown at other portions of Figure 1, the element 16 will completely come to rest in each space between two cans. Whenever

the can feeding means comes to rest with a can in position for contacting and displacing the element 16 so as to complete and maintain the circuit across the contacts 19 and 20, the solenoid coil 32 will be maintained in energized condition and the block 26 will be permitted to move down far enough to depress the member 42 and break the circuit across the contactor 40, thereby de-energizing the solenoid coil 44 and discontinuing the spray in the manner previously described. See Figure 3.

While one form of the invention has been shown for purposes of illustration, it is to be clearly understood that various changes in the details of construction and arrangement of parts may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. The combination of means for feeding cans in processional order, means for spraying a fluid substance into said cans, a solenoid valve for controlling the spraying means, a solenoid controlling circuit and a control switch connected in said circuit and disposed to be actuated by can contact for causing the valve to open and stay open while a can is passing the spraying means, and a timing relay unit connected in said circuit and normally operable to maintain the valve open, subject to said control switch, and operable in the event that the machine stops with a can in contact with said control switch to break said circuit and prevent continuous spraying into the can stationary opposite said spraying means.

2. The combination defined in claim 1 in which the timing relay unit includes a switch which is normally closed and connected in series with the coil of the solenoid valve and the normally open can contact closed switch, and means for causing the timing relay unit switch to open each time a normally recurring opening of the can contact closed switch is delayed a predetermined amount over and above the normal interval of spraying of an individual can.

3. The combination of means for feeding cans in processional order, a spray head for spraying a fluid substance into said cans, can actuated means including a can engaged switch and a spray head control circuit for bringing about operation of the head each time a can passes the same, and means for discontinuing the spraying operation after a predetermined interval of time should the feeding of cans be discontinued with the can actuated means in condition for bringing about an operation of said spray head, said last named means including a timer for determining a definite interval greater than that necessary for the spraying of a passing can and over which interval a spraying operation initiated by a single can can continue, and a control circuit breaker operable under control of said timer for discontinuing the spraying operation whenever a can remains at rest in position to receive the spray for an interval longer than said determined interval.

4. The combination of means for feeding cans in processional order, a spray head for spraying a fluid into said cans as they are passing the spray head, a valve for controlling operation of the spray head and serving when closed to stop the spray and when opened to permit spraying of said fluid, control valve actuated means including a control circuit and a can engaged switch operable during the passing of a can to effect an opening of the valve and to effect a closing of the

valve upon completion of the passing of the can, a second control switch connected in the control circuit and effective when opened to bring about a closing of the valve by said actuating means, and a timer for timing the operation of said second switch to open the same only after a predetermined time interval following an opening of the valve by the closing of said first mentioned switch.

5. The combination of means for feeding cans in processional order, a spray head for spraying a fluid into said cans as they are passing the spray head, a valve for controlling operation of the spray head and serving when closed to stop the spray and when opened to permit spraying of said fluid, timing means for determining a definite interval greater than that necessary for the spraying of a passing can and over which interval the spraying of a can can continue, control means including a control circuit and a switch placed in cooperative relation to said spray head and feeding means to be operated by a can contact for effecting an opening of the valve as a can comes opposite the spray head and for again closing the valve as the can is about to pass away from said spray head, and means operable under control of said timing means for breaking said control circuit and bringing about a closing of the valve whenever a can remains stationary opposite the spray head for an interval of time greater than said timing means determined interval.

6. The combination of means for feeding cans in processional order, means for spraying a fluid substance into the cans, and control means effective to bring about a spraying operation when a can is passing the spraying means and for discontinuing the spraying operation when no can is passing the spraying means or in the event that the feeding means stops with a can in position for receiving the spray, said control means including an electrical control circuit, a normally closed switch connected in said circuit, a normally open switch connected in said circuit and disposed to be actuated by can contact so as to be closed by the passing of a can for bringing about a continuous spraying operation while said can is passing and to open and discontinue said spraying operation as each can moves out of contact therewith, and a circuit breaking means including a timing device and effective to open the normally closed switch to break the control circuit and discontinue the spraying operation each time the can actuated switch is held open for an interval of time in excess of the normal interval of spraying of an individual can.

7. The combination of means for feeding cans in processional order, means for spraying a fluid substance into the cans, and control means effective to bring about a spraying operation when a can is passing the spraying means and for discontinuing the spraying operation when no can is passing the spraying means or in the event that the feeding means stops with a can in position for receiving the spray, said control means including an electrical control circuit, a normally open switch connected in said circuit and disposed to be actuated by can contact so as to be closed by the passing of a can for bringing about a continuous spraying operation while said can is passing and to open and discontinue said spraying operation as each can moves out of contact therewith, and a circuit breaker including a timing device conditioned upon each closing of the normally open switch to time a definite interval extending a limited amount beyond the normal in-

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terval of spraying a can and effective upon the continuation of a can spraying interval beyond said normal interval and as long as said definite interval, as by the stopping of the feeding means as aforesaid, to break the control circuit and discontinue the spraying operation.

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