

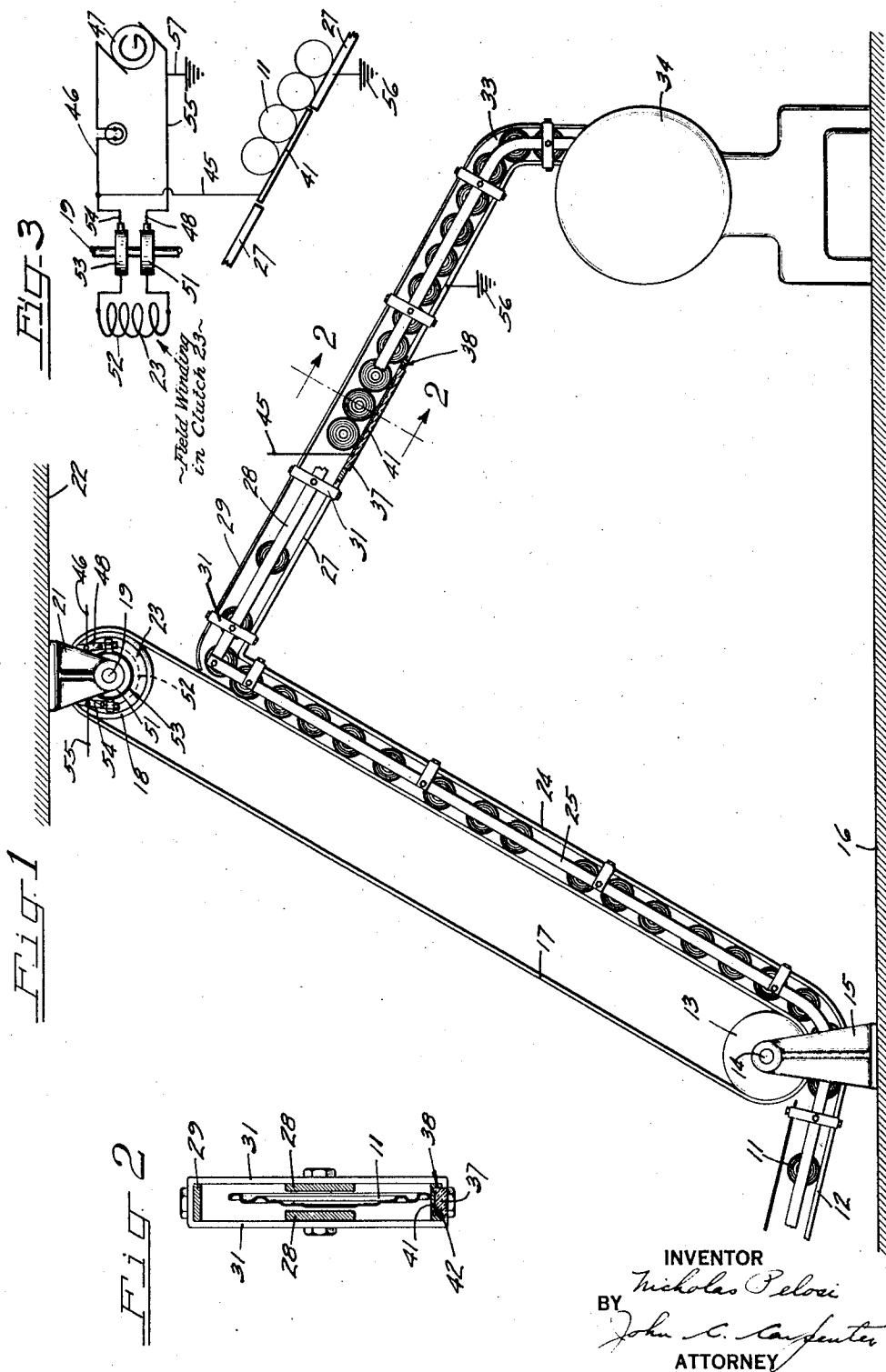
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LINE CONTROL FOR CAN MAKING MACHINERY

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LINE CONTROL FOR CAN MAKING
MACHINERY

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The present invention relates to a mechanism for controlling feeding of can parts and has more particular reference to automatically and electrically controlling the actuation of a feeding device delivering can parts into a runway leading to a machine by utilizing the can parts as electrical conductors.

The principal object of the present invention is the provision of a controlling mechanism for governing the operation of a can part feeding device for delivering can parts through a runway to a machine by utilizing the electrical conductivity of the can parts under certain conditions.

An important object of the invention is the provision of an electrical controlling mechanism located in a runway connecting a feeding device and a can machine and operated through an electrical circuit established by the can parts passing through the runway and becoming a part of the circuit, this circuit controlling the operation of the feeding device.

Numerous other objects of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

Referring to the drawing:

Figure 1 is a side elevation of a feeding device, a runway and a can machine embodying the present invention, parts being broken away;

Fig. 2 is a transverse sectional view of the runway, taken substantially along the line 2—2 in Fig. 1; and

Fig. 3 is a wiring diagram of the electric circuit.

For the purpose of exemplifying the present invention, there is disclosed in the drawing a can end elevator for feeding device which delivers the ends into a can end runway, through which they roll by gravity to a machine for performing a subsequent operation on the ends.

Operation of the elevator or feeding device is preferably controlled by an electro magnetic clutch in electrical connection with a detecting element located in the can end runway. This element is affected by an accumulation of can ends in the runway, occasioned by adverse operating conditions in the machine. When so affected the magnetic clutch stops movement of the elevator and delays delivery of can ends to the runway until the adverse condition is relieved.

Referring to the drawing, the numeral 11 indicates can ends which may be delivered to a guideway 12 in any suitable manner. From the guideway 12 the can ends roll into the lower part of a can end elevator or feeding device. This feeding device comprises an idler pulley 13 mounted on a shaft 14 journaled in brackets 15

resting on the floor generally indicated by the numeral 16. An endless elevator belt 17 operates over the pulley 13 extending upwardly at an angle and passes over a drive pulley 18. The pulley 18 is loosely mounted on a horizontal drive shaft 19 which is constantly rotated in any suitable manner.

Shaft 19 is journaled in brackets 21 attached to any convenient stationary part 22. Mounted on and keyed to the shaft 19 adjacent the pulley 18 is a clutch indicated generally by the numeral 23 which is preferably of the magnetic type controlled electrically to provide driving connection between the shaft 19 and the pulley 18.

A guide rail 24 carrying side guides 25 is mounted adjacent to and directly beneath the lower run of the belt 17 and is spaced away from the belt a distance substantially equal to the diameter of the can ends 11 providing a passageway for the ends coming from the guideway 12. The lower end of the guide rail 24 is attached to the bracket 15 directly in alignment with the guideway 12.

The guide rail 24 at its upper end is bent at right angles and slopes downwardly forming a can end runway 27 having side guide bars 28 and a top rail 29 attached thereto by means of spaced connecting links 31. Near its lowermost end the runway 27 is bent at 33 into a vertical section which leads to a machine 34 for performing a subsequent operation on the can ends.

The can end runway detecting element for operating the magnetic elevator clutch comprises a block of insulating material 37 which is located in a slot 38 cut in the runway 27 intermediate the guideway provided by the rails 24, 25 and the bend 33 of the runway. A metallic plate 41, preferably of copper, is pressed into a recess 42 formed in the block 37, the top surface of the plate 41 being flush with the upper surface of the block and the runway 27.

An electric circuit is provided to energize the magnetic clutch. This circuit comprises any suitable source of power as a generator 47 and wire 46 leading from the side of the generator to a brush holder 54 in contact with a ring 53 in turn electrically connected to the field winding 52 of the clutch 23. This winding is in turn connected to a second ring 51 in turn engaged by a brush 48. The brush 48 is connected by a wire 55 to the generator 47. Current flowing through this circuit maintains the clutch in engagement and the belt 17 in motion to elevate the can ends for delivery into the runway 27.

When a surplus of cans has accumulated in the runway 27 from the machine 34 up and onto the plate 41, a shunt circuit is closed to deenergize the coil or winding 52, with resultant disengagement of the clutch 23. The wire 55 is grounded at 57 and a wire 45 leads from wire 46 into elec-

trical engagement with plate 41. The frame of the runway 27 is grounded at 56. When a surplus of cans accumulates, the shunt circuit is formed as follows: Wire 46 to generator, wire 45 from plate 41, accumulated can ends 11, frame of the runway 27 and through grounds 56 and 57, and wire 55 to generator.

During the normal operation of the machine 34 and the elevator 17 the magnetic clutch connects the elevator with the source of driving power and current flows through the coil 52 from the generator 47. Under normal conditions the machine 34 uses the can ends 11 as fast as they are delivered to it, thereby preventing an accumulation of can ends in the runway.

If for any reason the machine 34 stops or fails to properly dispose of the incoming ends, these ends will pile up or accumulate in the runway with the resulting establishment of the shunt circuit and the stopping of the elevator as previously described.

It will be understood that the side guide bars 28 may be of insulating material or at least faced with insulating material except adjacent the plate 41 in order to prevent closing of the shunt circuit by paths other than through the plate 41. This insulation may be carried out in any suitable manner.

When the machine 34, which has been stopped and which has caused the accumulation of ends in the runway, resumes normal operation and again draws on the supply of ends the crowded condition is relieved and the plate is cleared. This breaks the shunt circuit and current is again supplied to the main circuit and to the field coil of the clutch again connecting the pulley 18 with the shaft 19 and putting the elevator into normal operation.

Under normal operating conditions the can ends pass through the runway and over the plate 41 so rapidly that sufficient current is not established in the shunt circuit to deenergize the field coil of the magnetic clutch. The can end elevator or feeding device thus continues to operate.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A can part runway control comprising in combination, a runway for conveying can parts, a feeding device for delivering said can parts into said runway, electrical means arranged at the bottom and side of the said runway and utilizing the can parts as electrical conductors for controlling the operation of the said feeding device.

2. A can part runway control comprising in combination, a runway for conveying can parts, a feeding device for delivering said can parts into said runway, an electrical magnetic clutch associated with the said feeding device for connecting it with an actuating mechanism, and two electric contacts located in the runway and both engageable at the same time by a can part as electrical conductors for controlling the operation of the said magnetic clutch.

3. A can part runway control comprising in combination, a can part feeding device, a runway for conveying can parts away from the said feeding device, and two electrical contacts located in the runway and engageable at the same time by a can part stopped in the runway by an excess of can parts therein and utilizing the can parts as electrical conductors for automatically preventing further feeding of can parts into the said runway until the excess of can parts has been relieved.

4. A can part runway control comprising in combination, a runway for conveying can parts, a feeding device for normally delivering can parts into said runway, an electrical magnetic clutch associated with a main electrical circuit for connecting said feeding device with an actuating mechanism to effect its normal can part delivery to the runway, and electric contacts on the runway, associated with an electrical shunt circuit for deenergizing the said magnetic clutch and stopping delivery of the can parts by the said feeding device, said electrical contacts being located in the said runway and utilizing a can part stopped in the runway as an electrical conductor when these can parts abnormally accumulate in the said runway so that a stopped can part touches both of said contacts.

5. The combination of an elevator for can parts, a downwardly directed runway leading from said elevator to said machine, a power element, a clutch for connecting said power element with said elevator, electric means for operating said clutch including an electric circuit, a second circuit adapted to deenergize the electric circuit of said clutch and having electric contacts in said runway, whereby a can part in said runway at said contacts may form a part of and complete said second circuit to disconnect said clutch, and means for removing can parts successively from the lower part of said runway.

6. The combination of a runway adapted to guide can parts, means for delivering said can parts to said runway, electrically operated means and an electric circuit therefor for actuating said delivering means, a machine adapted to take can parts intermittently from said runway, electric contacts on said runway adapted to be engaged by a can part stopped at said contacts, and electric conductors leading respectively from said contacts to said electric circuit and to ground, whereby a can part stopped at said contacts will cut out the electric current from said electrically operated delivering means.

7. A can-part runway control comprising in combination, a narrow guide for holding on edge can parts, ends and the like, an elevating belt adapted to bear on the edges of said can parts to roll them upward in said guide, electrically operated means and circuit for the same for driving said belt, an inclined runway to which said can parts are delivered from said guide, the runway being adapted to hold said can parts on edge to roll therein, means for taking said can parts intermittently from the runway, electric contacts on said runway adapted to be engaged by a can part stopped at said contacts, and electric conductors leading from said contacts respectively to said circuit and to ground, whereby a can part stopped between said contacts may connect them electrically and cut out the current in said circuit from said belt driving means.

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