April 29, 1958 M. J. WILCOX 2,832,281

CAN MARKING AND CONTROL DEVICE

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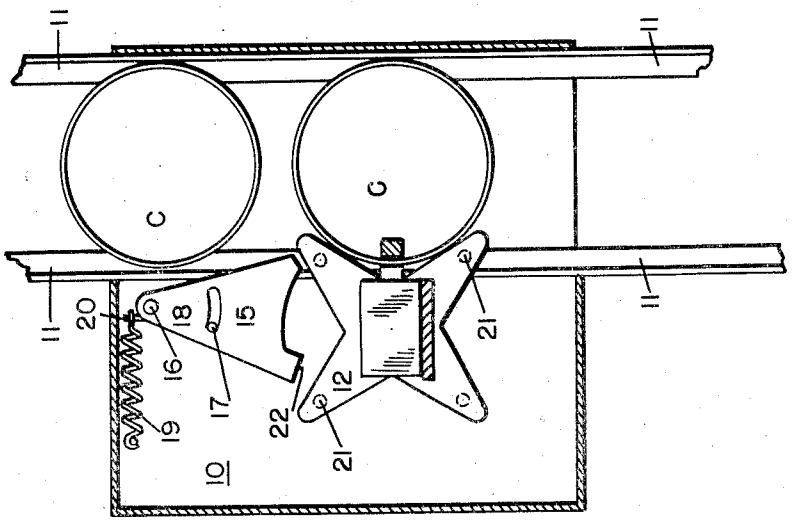


Fig. 2

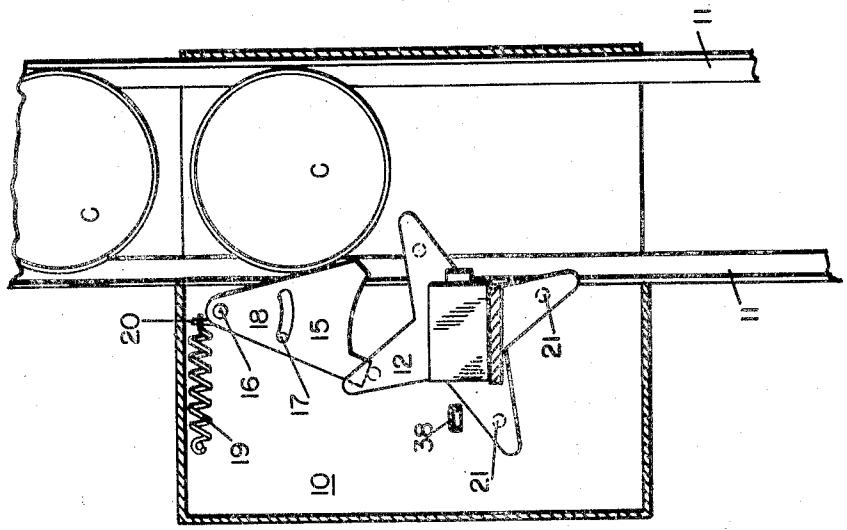


Fig. 1

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Fig 3

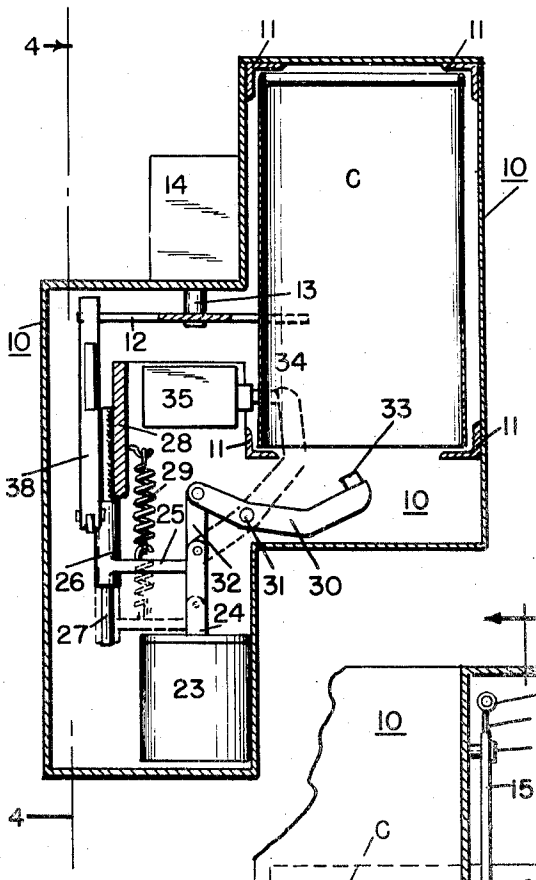


Fig 5

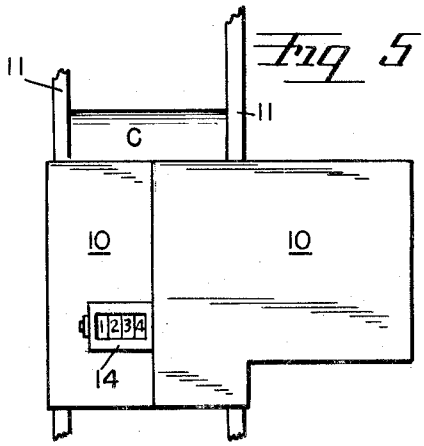
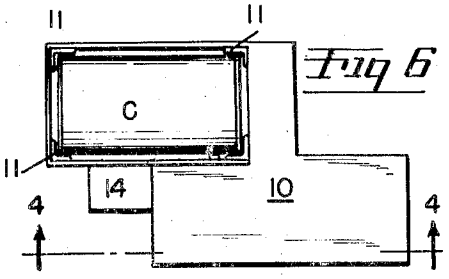


Fig 6



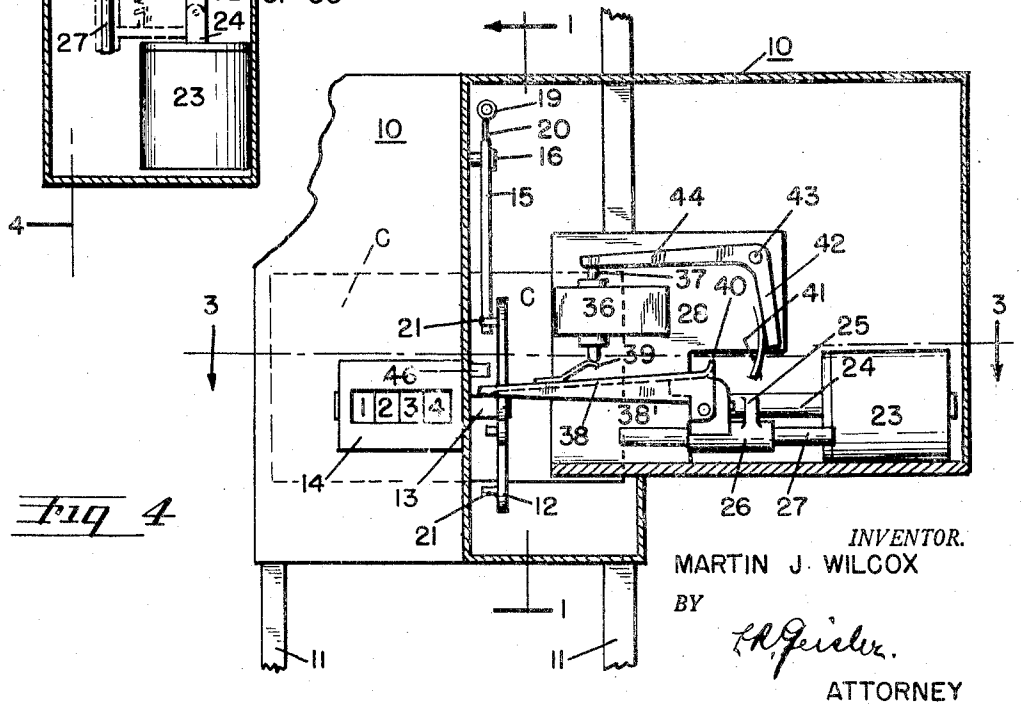


Fig 4

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CAN MARKING AND CONTROL DEVICE

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Application February 18, 1957, Serial No. 640,890

6 Claims. (Cl. 101—4)

The present invention relates to the automatic marking of empty cans as they are delivered in more or less rapid succession from a carrier or other suitable conveying means, and relates particularly to the marking of the cylindrical surfaces of the cans as they are being delivered to operators in a cannery in order to be filled by the operators, and this application is a continuation-in-part of the pending application Serial No. 579,609, filed under date of April 20, 1956, and entitled, "Marking and Counting Control Assembly."

It is the practice in commercial canneries to place identifying marking on the empty cans as they are delivered to each individual operator in order that when there is any question concerning a filled can, as for example, when a filled can does not meet established requirements, the operator by whom the can was filled can be identified.

In the device of the above mentioned previously filed application, the identifying mark is stamped in ink on the cylindrical wall of the can while the can is passing down to the work table of the operator. However, when the cans are being stamped in ink in quick succession, especially when such stamping takes place on the cylindrical surfaces of the cans, not only is the stamping of such moving cylindrical surfaces quite likely to be imperfect or illegible, but when each can is handled manually by the operator immediately after the stamping it has been found that there is considerable probability that a portion, if not all, of the marking will be inadvertently rubbed off or will be blurred as a result of the handling of the can inasmuch as insufficient time elapses for the ink of the marking to dry.

An object of the present invention is to provide an improved can marking device in which such identifying marking, instead of being stamped in ink on the can, will be embossed or pressed into the can metal.

A related object of this invention is to provide an improved can marking device in which the desired embossed marking will automatically be placed on the cylindrical wall of the can while the can is being delivered to the operator.

A further object is to provide such a device in which this embossed marking will not only take place automatically but will also be done so quickly that there will be no appreciable delay in the travel of the can to the operator's table and so that the cans can be marked as rapidly as they can be delivered by the conveyor.

An additional object of the invention is to provide a can-embossing device in which the cans will automatically be counted as they are marked or embossed.

From the following brief description the manner in which these objects and other incidental advantages of the invention are attained will be readily understood, and in the description reference is made to the accompanying drawings wherein:

Figure 1 is a sectional elevation of the device taken on a line indicated at 1—1 in Figure 4 and illustrating a can in the device just prior to being marked and counted;

Figure 2 is a similar sectional elevation showing the same can a moment later during the actual marking;

Figure 3 is a horizontal section on the line indicated at 3—3 in Figure 4, this section being taken at the moment of the marking of the can and thus when the can is in the position shown in Figure 2;

Figure 4 is a sectional elevation corresponding to line 4—4 of Figure 3 (and also to line 4—4 of Figure 6);

Figure 5 is an elevation of the device, drawn to a much smaller scale, taken from the left of Figures 1, 2 and 3; and

Figure 6 is a corresponding top plan view, drawn to the same scale as Figure 5, illustrating a can passing down the chute into the device.

A chute which leads downwardly from a can conveyor (the conveyor not being shown), is formed by the guide rails 11, these rails being so arranged and spaced that they form a chute of the proper size for the particular cans being used. In the figures, the cans are indicated by the letter C. The chute leads down through the device and is assumed to terminate at the operator's table so that the cans will be deposited on the table of the operator as they pass in succession down through the device.

A closed housing 10 the shape of which is shown best in Figure 3, is mounted on the chute and has openings in the top and bottom walls, corresponding to the cross sectional area of the chute, through which openings the chute passes.

A star wheel 12 (Figures 1 to 4 inclusive) is secured on a horizontal, rotatable shaft 13 (Figures 3 and 4). This shaft 13 is supported in and constitutes the actuating shaft for a numbering machine 14, of standard and well-known construction, which is secured on the outside of the housing 10. The star wheel 12 and the shaft 13 are so located that the star wheel will be engaged by each can C in turn as the can passes down the chute (see Figures 1 and 2) and the star wheel 12 will be rotated approximately 90° by each can in turn. The numbering machine 14 is so arranged that each quarter-turn of its actuating shaft 13 will cause one unit to be added to the number total indicated by the numbering machine.

In order to limit the rotation of the star wheel 12 to 90° each time the star wheel is turned by a can passing down the chute, and also to prevent any possible turning of the wheel by other means (such, for example, as by the insertion of a wire hook up into the housing 10 from below), in an attempt to increase the total count being recorded by the numbering machine 14, a control latch 15 (Figures 1, 2 and 4) is pivotally mounted in the housing 10 above the star wheel 12 on a support shaft 16. The pivotal swing of this latch 15 is restricted by a stationary pin 17, secured in the housing wall, which engages a slot 18 in the latch. A spring 19, having one end attached to the housing wall and the other end attached to an arm 20 secured to the top of the latch 15, holds the latch normally in the position illustrated in Figures 1 and 2 but enables the latch to be swung slightly in a clockwise direction, as viewed in these figures, when contacted by a can moving down the chute into the housing 10.

Each of the four arms of the star wheel 12 carries a pin 21 adapted to engage the bottom of the latch 15. The bottom end of the latch 15 has an edge portion 22 which is so arranged as to engage the pin 21 on the adjacent arm of the star wheel when the latch is in the normal position shown in Figure 1 and thus restrict the rotation of the star wheel. This edge portion 22 on the latch 15 slopes upwardly obliquely in the direction opposed to that in which the star wheel 12 normally rotates, and consequently, as illustrated in Figure 1, the latch 15 in normal position locks the star wheel against further clockwise rotation. However, a thrust against the latch 15 and against the force of spring 19, causing

the latch to swing slightly to the left, as viewed in Figure 1, results in releasing the star wheel momentarily from the latch. As apparent from Figures 1 and 2, the shape and location of the latch **15** are such that the latch will be engaged by each downwardly moving can, and, as a result of such engagement, the latch will be moved momentarily to unlocking position just before the can encounters the star wheel itself.

A solenoid **23** (see Figures 3 and 4) is firmly secured inside the housing **10** in the location shown in these figures. A plunger rod **24**, operated by the solenoid, has a bracket arm **25** which is rigidly connected to a sleeve **26** slidable on a stationary rod **27**. The rod **27** has one end secured on a vertical plate **28**, shaped as shown in Figure 4, which plate in turn is secured along its bottom edge to a portion of the bottom wall of the housing **10** in the relative position shown in Figures 3 and 4.

A spring **29** (Figure 3), having one end secured to the bracket arm **25** and the other end attached to the plate **28**, normally holds the plunger rod **24**, bracket arm **25** and sleeve **26** in the outer or full line position shown in Figure 3 but permits these to be moved to the broken line position when the actuation of the solenoid pulls the plunger rod inwardly.

A lever arm **30** (Figure 3), supported on a pivotal mounting **31** for swinging in a substantially horizontal plane, has one end connected by a link **32** to the outer end of the plunger rod **24**. One of a pair of cooperating embossing die members **33** is mounted on the free end of the lever arm **30**. The other cooperating die member **34** is secured on a rigidly mounted support **35** in such position as to be contacted by the member **33** when the lever arm **30** is swung (in counterclockwise direction) by the actuation of the solenoid **23** and the resulting movement of the plunger rod **24**. The two die members **33** and **34** under such condition cooperate to emboss or press a mark into the wall of a can if the can wall has the outside face positioned against the stationary member **34** while the other member **33** is forcibly impinged against the inside face of the can by the rapid swing of the lever arm **30**. Thus the stationary member **34** and its rigid support **35** act as the anvil against which the wall of a can rests during the instant in which the cooperating die members **33** and **34** cause the can wall to be deformed by the pressing of the desired marking on the can. Preferably the cooperating die members **33** and **34** will be removably mounted on the lever arm **30** and anvil support **35** respectively by suitable means (not shown) so that these die members can be changed to provide a different marking whenever desired. The embossing of the marking on the can will of course take place either outwardly or inwardly with respect to the can wall, depending upon which of the die members **33** and **34** is the male die and which is the female die.

The actuation of the solenoid **23** is controlled by a relay switch **36** (Figure 4) mounted on the plate **28** and operated by a slidable element **37**. An arm **38** is pivotally mounted on the sleeve **26** for a limited upward swing from the normal horizontal position shown in Figure 4. A spring **39**, carried by the arm **38**, contacts the relay switch element **37** and consequently a slight upward swing of the arm **38** will cause the relay switch to be closed which in turn closes the circuit to the solenoid **23**.

It will be noted from Figures 3 and 4 that the arm **38** is of such length that the outer end extends into the path of the star wheel **12**. Thus partial rotation of the star wheel (caused by a can coming into engagement with the star wheel) results in momentarily raising the arm **38**, which in turn causes the relay switch **36** to be closed and the solenoid **23** to be actuated. Since the actuation of the solenoid causes the plunger rod **24**, and therewith the sleeve **26**, to be moved to the right (as viewed in Figure 4), the arm **38** is also moved sufficiently to the right to be withdrawn momentarily out of the path of the star wheel **12**. At the same time this movement of the arm **38** (to the right in Figure 4) causes a lug **40** on the arm to strike against a spring member **41** attached to one arm of a bell crank lever **42**. The bell crank lever, pivotally mounted at **43** on the plate **28**, has its other arm **44** so arranged as to be in contact with the top of the control element **37** of the relay switch **36**. Thus the movement of the arm **38**, as a result of the actuation of solenoid **23**, immediately operates to open the relay switch **36** and to deactivate the solenoid **23**. In order to make sure that the downward movement of the can and the rotation of the star wheel will be accurately synchronized with the swing of the lever arm **30**, a stationary lug **46** (Figure 4) normally restricts the upward movement of the arm **38** (and thus the rotation of the star wheel) until actuation of the solenoid has started to move arm **38** to the right (as viewed in Figure 4). A suitable stop, indicated at **38'**, is provided to prevent the arm **38** from dropping down below the substantially horizontal normal position shown in Figure 4.

The manner in which the device operates as a whole will now be apparent from the foregoing description of the manner in which the various individual members of the device function. As a can drops down the chute it first encounters the latch **15**, moving it sufficiently to release the star wheel **12** momentarily. The can then encounters the star wheel **12** and gives it a partial rotation (Figure 2). This partial rotation of the star wheel raises the arm **38** (Figures 3 and 4) and causes the solenoid **23** to be actuated through the medium of the relay switch **36**. Actuation of the solenoid causes the lever arm **30** to be moved quickly and forcibly from the full line position of Figure 3 to the broken line position, causing the die member **33** to strike the inside of the wall of the can while the can wall is in contact with the other cooperating die member **34** on the stationary anvil support. Then the deactivating of the solenoid immediately causes the lever arm **30** to be swung back to original position out of the path of the downwardly moving can by means of spring **29**. The can continues downwardly to the operator's table while the star wheel **12** is again held against further rotation by contact with the latch **15**. During this operation the resulting 90° rotation of the star wheel has caused one unit to be added to the number total displayed by the numbering machine **14**.

This entire operation is of course repeated with each successive can, and, since only a moment is required for completion of the entire operation, the cans can be delivered in rapid succession without any delay being caused by the operation of the device.

Instead of employing a pair of embossing dies, one on the anvil support **35** and one on the lever arm **30**, as previously described, it has been found entirely satisfactory to mount a male die element on one of these members and mount a cooperating block element of semi-resilient material on the other member. For example, satisfactory results are obtained by removably mounting the male die on the anvil support **35** and mounting a cooperating block of plastic on the arm **30**. This arrangement has the advantage of enabling any change in the marking to be made easily and quickly merely by changing the die on the anvil support, no change of the cooperating block element on the lever arm **30** being required. Of course the male die similarly could be removably mounted on the lever arm **30** and the plastic block secured on the anvil support.

Various minor other modifications could be made in the device within the scope of the invention.

I claim:

1. In a can marking and control device, a downwardly-sloping chute, a star wheel extending part way into said chute and so arranged and positioned as to be engaged and partially rotated by a can passing down said chute, a numbering machine operated solely by the rotation of

said wheel, and a locking latch for said wheel preventing the rotation of said wheel and therewith the operation of said numbering machine when said latch is in normal wheel-engaging position, said latch located above said wheel and a portion of said latch extending into said chute and so positioned as to be engaged and temporarily moved to releasing position by a can passing down said chute.

2. In a can marking device of the character described, a chute, a star wheel extending part way into said chute and so arranged and positioned as to be engaged and partially rotated by a can passing along said chute, means controlling the rotation of said wheel, said means so arranged as to be momentarily released by the movement of a can passing along said chute to said wheel, and, when so released, enabling partial rotation to be imparted to said wheel, electrically-operated can-marking means in said chute, and a switch assembly operated by the rotation of said wheel controlling the actuation of said can marking means.

3. In a can marking device, a downwardly-sloping chute, a star wheel extending part way into said chute and so arranged and positioned as to be engaged and partially rotated by a can passing down said chute, means controlling the rotation of said wheel, said means so arranged as to be momentarily released by the movement of a can passing down said chute to said wheel, and, when so released, enabling partial rotation to be imparted to said wheel, electrically-operated can marking means in said chute, and a switch assembly operated by the rotation of said wheel controlling the actuation of said can marking means, said can marking means including a lever arm mounted to swing into the open end of a can and against the inside wall of the can, a stationary mounting so positioned as to be contacted by the outside wall surface of the can in said chute and to serve as the anvil member for said lever arm, and cooperating marking elements mounted on said anvil member and said lever arm respectively.

4. In a can marking device, a downwardly-sloping chute, a star wheel extending part way into said chute and so arranged and positioned as to be engaged and partially rotated by a can passing down said chute, means controlling the rotation of said wheel, said means so arranged as to be momentarily released by the movement of a can passing down said chute to said wheel and, when so released, enabling partial rotation to be imparted to said wheel, electrically-operated can marking means in said chute, said can marking means including a lever arm mounted to swing into the open end of a can against the inside wall of the can, a stationary mounting so positioned as to be contacted by the outside wall surface of the can in said chute and to serve as the anvil member for said lever arm, cooperating marking elements on said anvil member and said lever arm respectively, a solenoid operating said lever arm, a relay switch in the circuit of said solenoid, a control for said switch, and an actuating member in said control engageable by said wheel and moved into actuating position whenever rotation is imparted to said wheel by a can in said chute.

5. In a can marking and control device of the character described, a downwardly-sloping chute, a star wheel extending part way into said chute and so arranged and positioned as to be engaged and partially rotated by a can passing down said chute, a numbering machine operated solely by the rotation of said wheel, a locking latch for said wheel preventing the rotation of said wheel and therewith the operation of said numbering machine when said latch is in normal wheel-engaging position, said latch located above said wheel and a portion of said latch extending into said chute and so positioned as to be engaged and temporarily moved to releasing position by a can passing down said chute, electrically-operated can marking means in said chute, and a switch assembly operated by the rotation of said wheel controlling the actuation of said can marking means, said can marking means including a lever arm mounted to swing into the open end of a can against the inside wall of the can, a stationary mounting so positioned as to be contacted by the outside wall surface of the can in said chute and to serve as the anvil member for said lever arm, and cooperating marking elements on said anvil member and on said lever arm respectively.

6. A can marking and control device including a downwardly-sloping chute, a housing mounted along said chute, a star wheel in said housing extending part way into said chute and so arranged and positioned as to be engaged and partially rotated by a can passing down said chute, a shaft for said wheel, said wheel secured to said shaft, a numbering machine operated solely by the rotation of said shaft, a locking latch for said wheel preventing the rotation of said wheel and therewith the operation of said numbering machine when said latch is in normal wheel-engaging position, said latch located above said wheel and a portion of said latch extending into said chute and so positioned as to be engaged and temporarily moved to releasing position by a can passing down said chute, can marking means in said chute, a lever arm in said can marking means, said lever arm mounted to swing into the open end of a can against the inside wall of the can, a stationary mounting so positioned as to be contacted by the outside wall surface of the can in said chute and to serve as the anvil member for said lever arm, cooperating marking elements on said anvil member and on said lever arm respectively, electrically-operated means operating said lever arm, a control in said electrically-operated means, and an actuating member in said control engageable by said wheel and moved into actuating position whenever rotation is imparted to said wheel by a can in said chute.

No references cited.