

Nov. 14, 1967

C. C. HUNNICUTT

3,352,230

PRESS FOR TIN CANS

Filed March 7, 1966

2 Sheets-Sheet 1

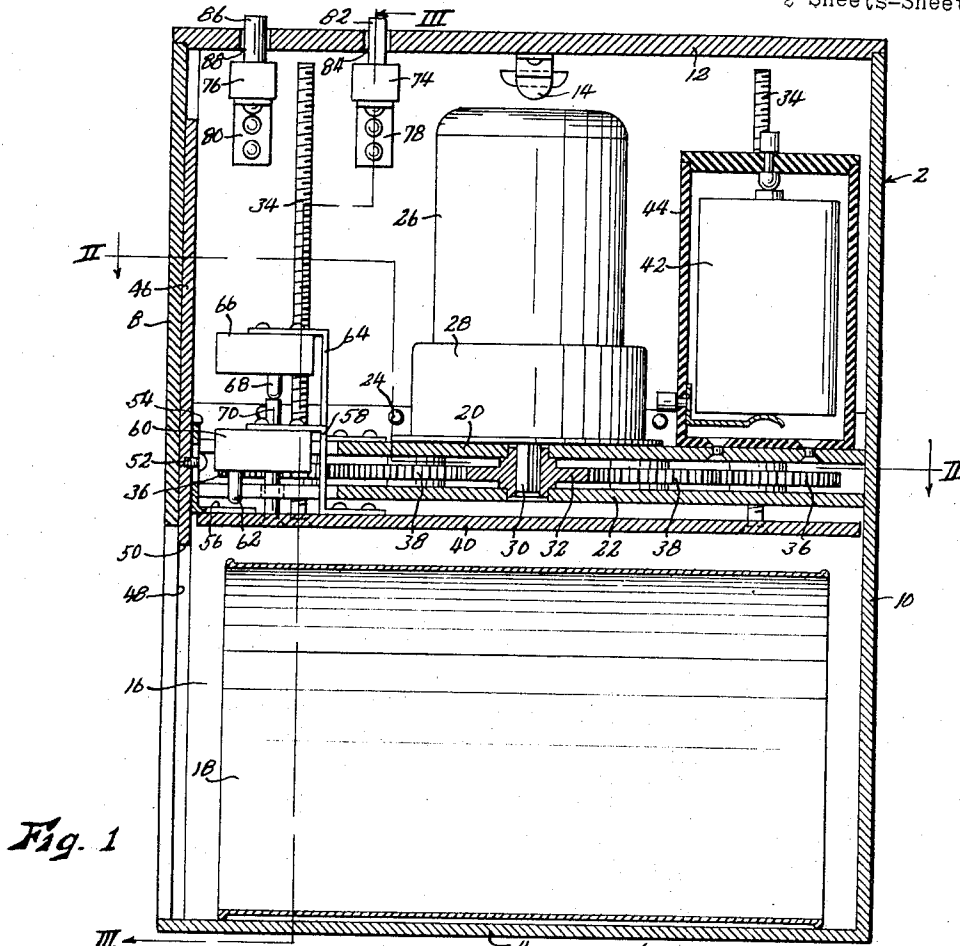


Fig. 1

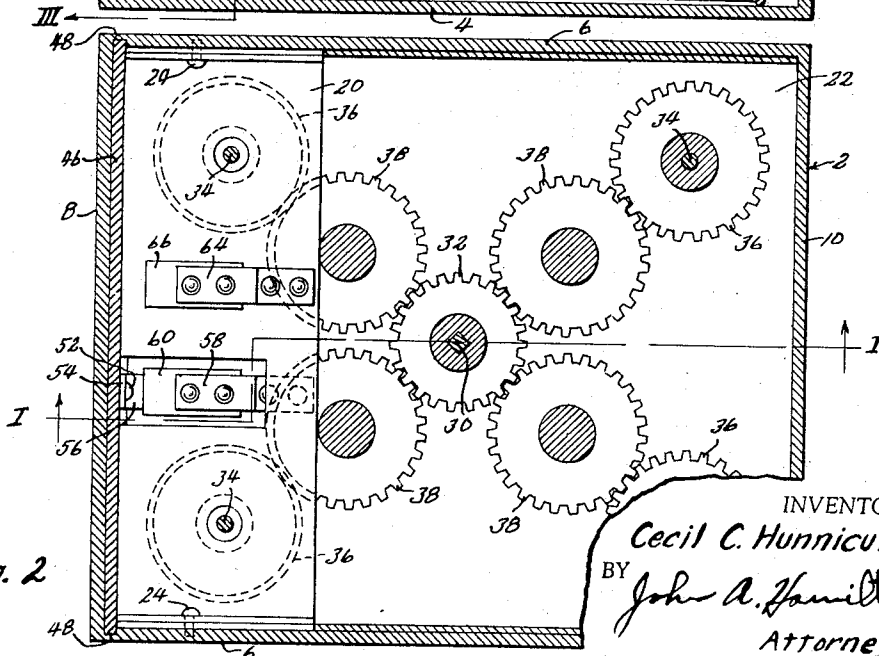


Fig. 2

INVENTOR
Cecil C. Hunnicutt
BY John A. Hamilton
Attorney.

1

3,352,230

PRESS FOR TIN CANS

Cecil C. Hunnicutt, Sabetha, Kans., assignor to Instrument Research, Inc., Sabetha, Kans., a corporation of Kansas

Filed Mar. 7, 1966, Ser. No. 532,224

3 Claims. (Cl. 100—53)

ABSTRACT OF THE DISCLOSURE

A press for tin cans comprising a box-like housing having an aperture through which a can may be inserted between the floor of said housing and a movable, power-driven pressure plate carried in said housing, whereby to be crushed therebetween, said housing having a door movable across said aperture slightly in advance of said pressure plate. Safety measures include provisions whereby an actuating button must be continually manually depressed to advance the pressure plate, and said plate is halted and retracted if the button is released, and whereby the pressure plate is halted if any foreign object obstructs the movement of said door.

This invention relates to new and useful improvements in household appliances, and has as its principal object the provision of a press operable to flatten tin cans for ease and convenience of disposal, in that a large number of cans may conveniently be condensed to occupy only a small space. The large and ever-increasing proportion of the usual family's food supply which is purchased in tin can containers, and problem of storing empty cans for disposal, due to their large bulk, are well known aspects of modern life.

Other important objects of the present invention are the provision of a can press of the character described having certain safety provisions rendering it virtually impossible for the user to be injured by the accidental insertion of his fingers or hands into press during operation thereof. For instance, continuation of the pressing operation requires continuous pressure on an operating switch well separated from the pressure zone. If pressure on this switch is relaxed, advancement of the pressure plate not only is halted, but also said pressure plate is retracted, entirely automatically. Also, the pressure zone is disposed within a housing having an opening through which the can to be pressed is inserted, said opening being provided with a closure door movable with the pressure plate, slightly in advance of said pressure plate and partially obstructing said opening. If the user's hand or fingers are accidentally inserted through the opening as the pressure plate is advanced, they will be engaged by said door before being engaged by the pressure plate. The door movement is thus arrested while movement of the pressure plate continues, and means are provided for automatically halting movement of the pressure plate in response to relative movement between the pressure plate and door.

Other objects are simplicity and economy of construction, ease and convenience of usage, and efficiency and dependability of operation.

With these objects in view, as well as other objects which will appear in the course of the specification, reference will be had to the accompanying drawing, wherein:

FIG. 1 is a vertical sectional view of a press for tin cans embodying the present invention, taken generally on line I—I of FIG. 2, shown ready for use and with a can inserted therein preparatory to the flattening of said can,

2

FIG. 2 is a sectional view taken on line II—II of FIG. 1,

FIG. 3 is a slightly irregular sectional view taken on line III—III of FIG. 1,

FIG. 4 is a reduced top plan view of the press, with the cover plate partially broken away,

FIG. 5 is a reduced front elevational view of the press as shown in FIG. 1, and

FIG. 6 is a schematic wiring diagram of the press.

Like reference numerals apply to similar parts throughout the several views, and the numeral 2 applies generally to the housing of the press, said housing being formed of any suitable rigid structural material and being rectangular in form, having a floor 4, side walls 6, front wall 8, a rear wall 10 and a removable top cover plate 12 releasably secured thereto by any suitable means, such as by spring clips 14, one of which is shown in FIG. 1. An opening 16 is formed in the lower portion of front wall 8 for the insertion of a tin can 18 into the housing, said opening being flush with floor 4 and side walls 6, and extending about midway in the height of front wall 8. Tin can 18 is rested on its side on floor 4 as shown in FIG. 1, said floor acting as a base against which the can is flattened. In preparing the can for flattening, the end walls of the can are either cut out entirely as shown, or are nearly severed and then folded into the interior of the cylindrical portion of the can.

Just above the level of opening 16, the housing is horizontally divided by a pair of closely spaced parallel plates, an upper plate 20 and a lower plate 22, said plates having upturned edges secured to housing side walls 6 by screws 24. Mounted on the upper surface of plate 20 is a reversible electric motor 26 operable to drive a geared speed reducing unit 28, said motor-reducer combination having an output shaft 30 extending vertically downwardly through plate 20, said output shaft being squared and engaged non-rotatably in the hub of a gear 32 which is carried rotatably between plates 20 and 22. Adjacent each of the four corners of the housing a vertical screw 34 extends through plates 20 and 22, being threaded operably in a geared nut 36 rotatably mounted between said plates. Each geared nut 36 is operably connected to gear 32 by means of an idler gear 38 also rotatably mounted between plates 20 and 22. The gear train is best shown in FIG. 2. The lower ends of all of screws 34, below plate 22, are riveted non-rotatably in a horizontal pressure plate 40 which is generally co-extensive with the inner horizontal dimensions of the housing, and which is vertically movable in said housing. It will be seen that whenever motor 26 is energized, it will function through reducer 28, output shaft 30, gear 32, idler gears 38, and geared nuts 36 to move screws 34 vertically upwardly or downwardly depending on the direction of rotation of the motor whereby either to advance pressure plate 40 downwardly to flatten can 18 against floor 4, or to retract said pressure plate upwardly. Speed reducer 28 is preferably so related to the motor speed, and to the ratio of gears 32 and 36 and the pitch of screws 34 that pressure plate 40 is moved all the way down to a position closely adjacent floor 4 in a short time, perhaps 5–6 seconds although this is of course a matter of choice. Electric power for motor 26 is furnished, as shown, by a dry-cell battery 42 mounted in an insulated battery case 44 fixed in the upper portion of the housing behind motor 26. Household line current could of course be utilized if desired.

The can insertion opening 16 of front housing wall 8 is controlled by a vertical, planar closure door 46, the vertical edges of said door being freely slidable in grooves 48 formed therefor in side housing walls 6, whereby said door is movable downwardly to its closed position with its

lower edge 50 resting on floor 4, by gravity. Affixed to the inner face of said door by screw 52 is an angled bracket 54 having a leg 56 which normally rests by gravity on the upper surface of pressure plate 40, as shown in FIGS. 1 and 3. When said bracket leg is so engaged, the lower edge 50 of the door extends slightly below the pressure plate, as shown. Mounted on the upper surface plate, by means of bracket 58, is an electric switch 60 having an operating pushbutton 62 which extends downwardly directly above bracket leg 56. The pushbutton is not engaged by said bracket leg so long as the latter rests on pressure plate 40, but is pressed upwardly by said bracket leg whenever door 46 is elevated relative to said pressure plate. Switch 60 acts as a lower limit and safety switch, as will be fully described hereinbelow.

Mounted on the upper surface of divider plate 20, as by bracket 64, is an electric switch 66 having an operating pushbutton 68 which extends downwardly and which is pressed upwardly by a push rod 70 riveted at its lower end in pressure plate 40 and operable to be extended upwardly through holes 72 provided therefor in divider plates 20 and 22 as the pressure plate is moved upwardly. Said push rod presses pushbutton 68 only at the extreme upper limit of the travel of the pressure plate. Switch 66 acts as an upper limit switch, as will be fully described hereinbelow. Also included are an on-off switch 74 and an actuating switch 76, both mounted just beneath cover plate 12 respectively by means of brackets 78 and 80 affixed to one of housing side walls 6. On-off switch 74 is manually operable by means of a toggle lever 82 extending through a slot 84 formed in cover plate 12, and actuating switch 76 is operable by a pushbutton 86 extending through a hole 88 formed in the cover plate.

Referring next to FIG. 6, it will be seen that on-off switch 74 is of the double-pole, double-throw type, having two poles 90 and 92 operable respectively to engage contacts 94 and 96 when lever 82 is in its "On" position and to engage contacts 98 and 100 respectively when lever 82 is in its "Off" position. The terminals of battery 42 are connected to poles 90 and 92 respectively by wires 120 and 122. Actuating switch 76 is also of the double-pole, double-throw type, having a pair of poles 102 and 104 operable to be engaged respectively with contacts 106 and 108 by the pressure of a spring 110, but to be engaged respectively with contacts 112 and 114 whenever pushbutton 82 is manually depressed. Contacts 94 and 96 of the on-off switch are connected respectively to poles 102 and 104 of the actuating switch by wires 116 and 118. A wire 124 connects contact 106 with the pole 126 of upper limit switch 66, this switch being of the single-pole, single-throw variety wherein the pole 126 is normally held in engagement with fixed contact 128 by a spring 130, and being opened by pressure on pushbutton 68. Contact 128 is connected by wires 132 and 134 with one terminal of motor 26, the other terminal of said motor being connected by wire 136 with contacts 108 and 112 of the actuating switch. It will be understood that motor 26 is of a type the direction of rotation of which may be reversed by reversing the polarity of the current supplied thereto. Contact 100 of the on-off switch is connected by wire 138 to the pole 140 of limit switch 60, this switch also being of the single-pole, single-throw type wherein the pole is normally held in engagement with fixed contact 142 by a spring 144, but is opened by pressure on pushbutton 62. Contact 142 is connected by wires 146 and 134 to one terminal of motor 26, and the other terminal of said motor is connected by wires 136 and 148 to contact 98 of the on-off switch. Contact 114 of the actuating switch is connected by wires 150 and 138 to pole 140 of switch 60.

In explaining the operation in detail, assume that first the parts have the position shown in the drawing, pressure plate 40 being completely elevated and holding door 46 open for the insertion of a can 18, switch 74 being in the "On" position, actuating pushbutton 86 being re-

leased, upper limit switch 66 being opened by pressure of push rod 70 on pushbutton 68, and lower limit switch 60 being closed. The system is then at rest. After inserting can 18 as shown, the operator depresses pushbutton 86, thus closing poles 102 and 104 of the actuating switch on contacts 112 and 114. This completes a "lowering" circuit from battery 42 through wire 120, pole 90 and contact 94 of the on-off switch, wire 116, pole 102 and contact 112 of the actuating switch, wire 136, motor 26, wires 134 and 146, contact 142 and pole 140 of lower limit switch (now closed) wires 138 and 150, contact 114 and pole 104 of the actuating switch, wire 118, contact 96 and pole 92 of the on-off switch, and wire 122. Motor 26, thus energized, functions as previously described to lower pressure plate 40 to flatten can 18 against housing floor 4.

As a safety measure it is provided that pushbutton 86 must be kept manually depressed by the operator during the entire pressing operation, in order that should the operator accidentally get his fingers in the press, or note any malfunction, release of the pushbutton 86 will instantly halt the downward progress of the pressure plate by opening contacts 112 and 114 of the actuating switch to interrupt the lowering circuit. Moreover, release of pushbutton 86 also closes the actuating switch on contacts 106 and 108 thereof. This completes a "raising" circuit from battery 42 through wire 120, pole 90 and contact 94 of the on-off switch, wire 116, pole 102 and contact 106 of the actuating switch, wire 124, pole 126 and contact 128 of upper limit switch 66 (which has been closed by the initial downward movement of the pressure plate 40), wires 132 and 134, motor 26, wire 136, contact 108 and pole 104 of the actuating switch, wire 118, contact 96 and pole 92 of the on-off switch, and wire 122. The polarity of this circuit is opposite, with respect to motor 26, from the polarity of the lowering circuit, and the motor is thus reversed to raise the pressure plate. This is an additional safety provision in that it provides for automatic and quick release of the operator's fingers in the event they should be caught in the press. The resulting upward movement of the pressure plate will continue until upper limit switch 66 is opened by pressure of push rod 70 on pushbutton 68, and the system will again come to rest.

If the operator's fingers are at any time present in the pressure chamber during the pressing operation, or if the can has not been fully and properly inserted under the pressure plate, the fingers or the can will be engaged by the lower edge 50 of door 46. The downward movement of the door will thereby be arrested, and it will thereafter be elevated relative to the pressure plate as the latter continues its downward movement. This relative elevation causes bracket leg 56 to engage and press pushbutton 62 of lower limit switch 60, forcing said switch to open against spring 144, thereby interrupting the lowering circuit already described to arrest the downward movement of the pressure plate, although the pressure plate of course will not again rise until pushbutton 86 is released. This of course is a most valuable safety provision, since it functions automatically without attention from the operator, and would for example protect a child who might insert his fingers in the press without the knowledge of the operator. If the pressing operation proceeds normally, with pressure plate 40 closely approaching floor 4 to flatten the can, it will be seen that as this movement is being completed, the lower edge 50 of the door will engage floor 4 and be elevated thereby with respect to the pressure plate, thereby opening limit switch 60 as before. This prevents damage to the motor in the event pushbutton 86 should be kept depressed longer than necessary.

When the press is not to be used, on-off switch 74 is moved to the "off" position, opening contacts 94 and 96 thereof and closing contacts 98 and 100. Opening of contacts 94 and 96 deactivates the raising and lowering circuits previously described, by removing actuating switch

5

76 from the circuits, but the closure of contacts 98 and 100 completes an auxiliary lowering circuit. This circuit extends from battery 42 through wire 120, pole 90 and contact 98 of the on-off switch, wires 148 and 136, motor 26, wires 134 and 146, contact 142 and 140 of the lower limit switch, wire 138, contact 100 and pole 92 of the on-off switch, and wire 122. The polarity of this circuit relative to motor 26 is the same as that of the main lowering circuit already described, so that the motor, thus actuated, operates to lower pressure plate 40 and door 46, until said door completely closes opening 16 and the lower edge thereof engages floor 4 and is elevated thereby relative to the pressure plate to open switch 60, whereupon the system comes to rest with the door closed. The closed door provides the press with a neater appearance, when not in use, and prevents the accidental or careless insertion of foreign objects therein. Upon movement of the on-off switch to the "on" position, the raising circuit already described will of course be re-actuated, whereupon pressure plate 40 will be elevated and door 46 will be reopened to ready the device for use.

While I have shown and described a specific embodiment of my invention, it will be readily apparent that many minor changes of structure and operation could be made without departing from the spirit of the invention as defined by the scope of the appended claims.

What I claim as new and desire to protect by Letters Patent is:

1. A press for flattening tin cans comprising:

- (a) a housing having therein an internal base and an access opening through which a tin can may be inserted to rest on said base,
- (b) a pressure plate carried in said housing for movement therein from an upper retracted position spaced apart from said base whereby said can may be inserted therebetween, to a lowered position adjacent said base, whereby said can is flattened therebetween,
- (c) a reversible electric motor carried in said housing and having first and second operating electric circuits operable to cause rotation of said motor in respectively opposite directions respectively to lower or raise said pressure plate,
- (d) actuating means carried by said housing and comprising a reversing electric switch having an operating member movable to a first position to close said first operating circuit, or to a second position to close said second operating circuit,
- (e) means biasing said switch operating member yieldably to said second position,
- (f) manually operable means for moving said switch operating member to said first position against said biasing means,

6

- (g) a door carried for free vertical movement by said housing and lowerable by gravity to close said can insertion opening thereof,
 - (h) a bracket fixed to said door and normally resting by gravity on the upper surface of said pressure plate, whereby said door is raised and lowered with and by said pressure plate, the lower edge of said door extending slightly below said pressure plate when said bracket is resting on said plate, and
 - (i) a normally closed safety switch mounted on said pressure plate and connected in series in said first motor operating circuit, said switch having an operating member engageable by said bracket to open said safety switch whenever said door is elevated relative to said pressure plate.
2. The structure as recited in claim 1 wherein said housing base forms an abutment engageable by the lower edge of said door as said pressure plate approaches the lowermost limit of its movement, whereby said door is elevated relative to said pressure plate to open said safety switch.
3. The structure as recited in claim 2 with the addition of:
- (a) a manually operable two-position switch operable in one position to complete said first and second motor operating circuits through said reversing switch, and in its other position to complete an auxiliary circuit operable to cause rotation of said motor in a direction to lower said pressure plate, said safety switch being connected in series in said auxiliary motor operating circuit.

References Cited

UNITED STATES PATENTS

2,150,812	3/1939	Aukerman.	
2,212,047	8/1940	Ross.	
2,234,098	3/1941	Wells	100—53
2,800,159	7/1957	Walsh et al.	100—53
2,962,959	12/1960	Sholin.	
3,104,607	9/1963	Galas	100—53
3,208,372	9/1965	Taylor	100—290 X
3,229,618	1/1966	O'Connor	100—250 X
3,232,220	2/1966	Sileski	100—289 X
3,253,537	5/1966	Porter et al.	100—256 X

FOREIGN PATENTS

573,058	5/1959	Belgium.
---------	--------	----------

BILLY J. WILHITE, *Primary Examiner.*