United States Patent [19]

Girten

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[54] **CAN CRUSHING APPARATUS**

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[52] **U.S. Cl.**..... **100/282,** 100/DIG. 2, 100/218, 100/295, 241/262

[51] **Int. Cl.**..... **B30b 1/06**

[58] **Field of Search**..... 241/99, 262; 100/295, 292, 282, DIG. 1, DIG. 2, 245, 218

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[57] **ABSTRACT**

An apparatus for crushing and flattening cans or other receptacles comprising, a pair of crushing plates between which cans to be crushed and flattened are caused to become positioned, one of the crushing plates being a vertical and stationary one, the other plate being angularly disposed and having bodily slidable movement relatively to the fixed crushing plate. Means are provided for slidably moving the movable crushing plate to and from the stationary crushing plate so that cans entering between the plates receive intermittent pressure and release to be crushed and flattened. Opposing faces of the crushing plates may be serrated or otherwise roughened for non-slip engagement with the cans.

2 Claims, 4 Drawing Figures

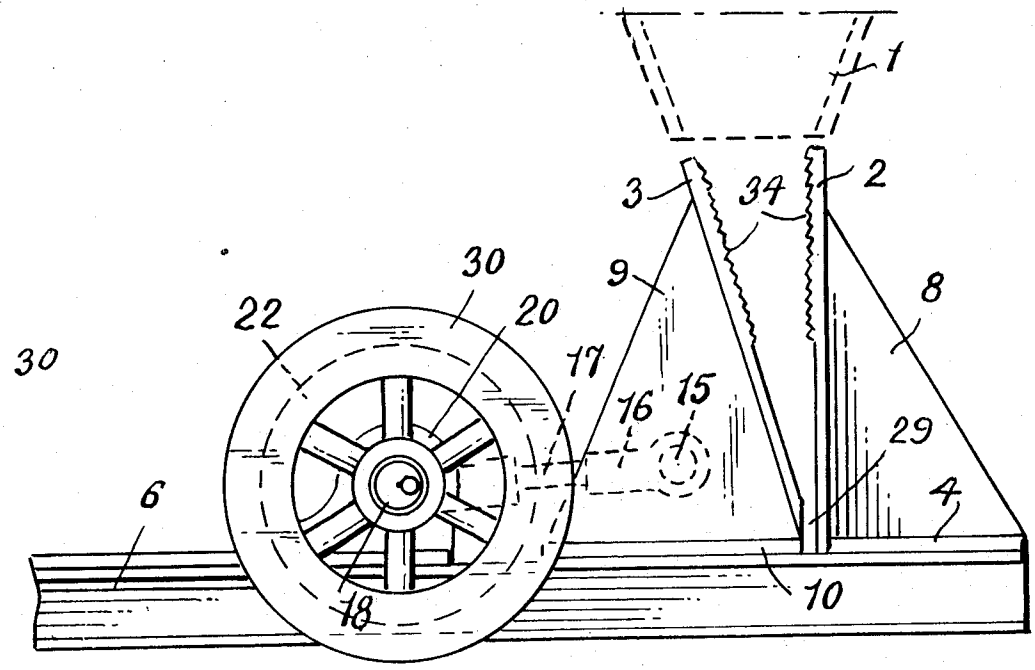


FIG. 1.

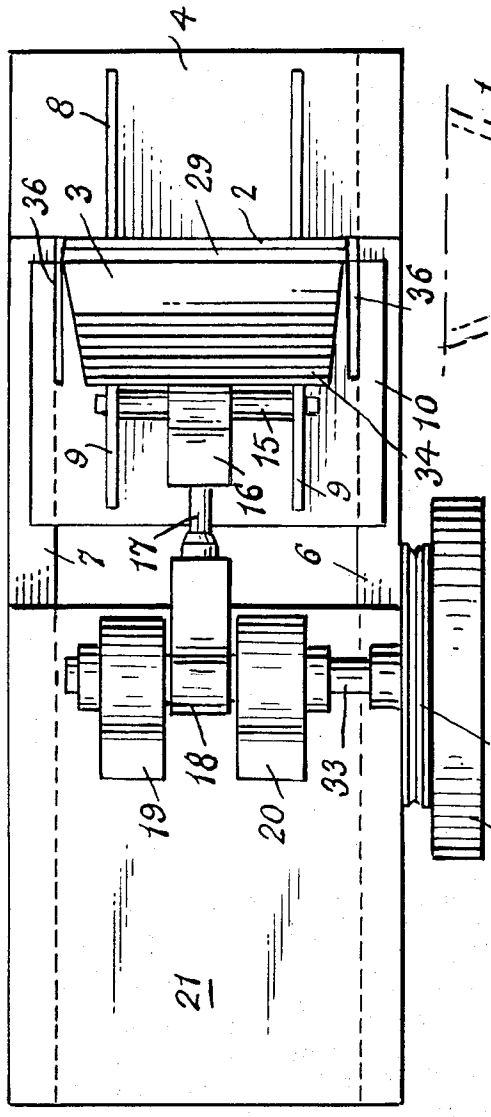


FIG. 2.

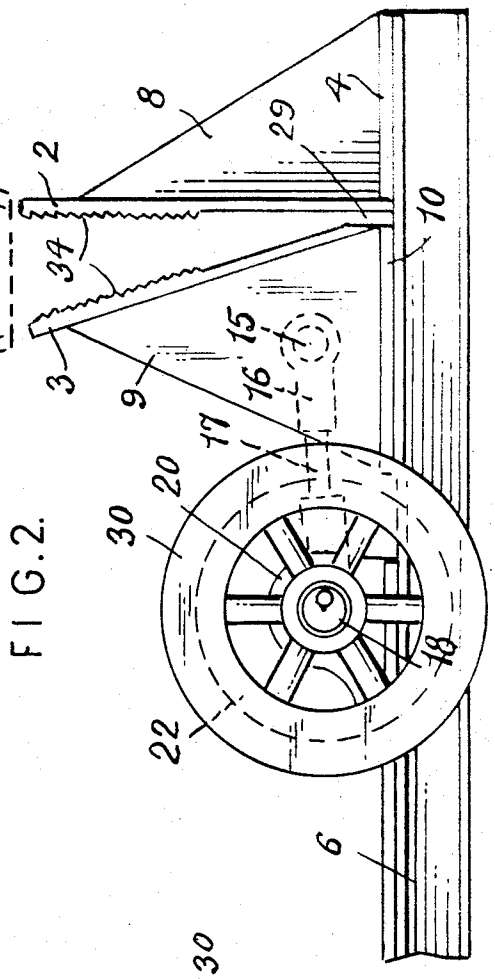


FIG. 3.

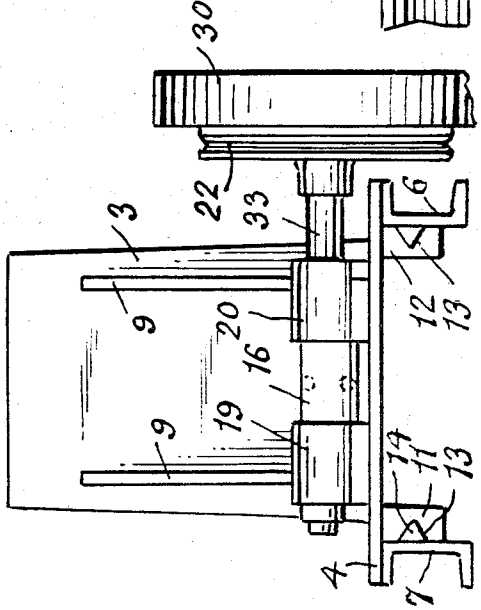
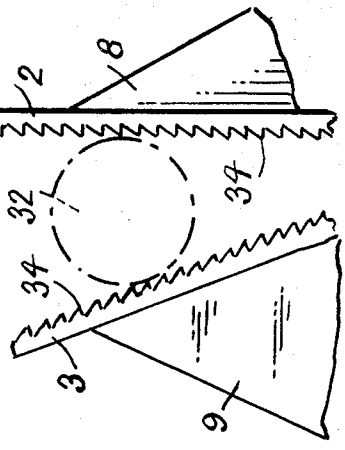


FIG. 4.



CAN CRUSHING APPARATUS

The present invention relates to a device for crushing and flattening cans or similar receptacles, and one of the objects of the invention is to provide an automatic means for flattening the successive cans that can be delivered from a hopper into the flattening device.

The device is particularly adaptable for crushing and flattening hollow metallic cans, such as those which are composed of aluminum, their volume being considerably reduced by being flattened, so that the space required for storage and the transportation of any given number of the cans will be very materially decreased.

For example, a conventional aluminum can may be flattened to about one-eighth of an inch in thickness. Thus, many more of the flattened cans may be shipped to an aluminum recovery plant than if the cans were transported in their unflattened condition.

More particularly, the invention contemplates the provision of an apparatus having a fixed or stationary vertically-disposed crushing plate or jaw, and a slidably reciprocated movable crushing plate which moves to and from the fixed plate, thereby alternately imparting pressure on the cans and relieving the pressure. Motor-driven means, such as an eccentric, reciprocates the movable crushing plate and the successive cans, entering between the crushing plates from a hopper or other source of supply, are crushed and they progress downwardly and finally leave the space between the crushing plates through a slot opening at the lower ends of the crushing plates.

In the accompanying drawing, wherein an illustrative embodiment of the invention is disclosed,

FIG. 1 is a top plan view of a can crushing and flattening device constructed in accordance with the invention;

FIG. 2 is a side elevational view of the device;

FIG. 3 is an end view of the apparatus as seen from the left of Fig. 1; and,

FIG. 4 shows parts of the two crushing plates.

Referring to the drawing, there is shown therein a hopper 1 containing the uncrushed cans which are to be flattened and which successively descend from the hopper to a crushing position between a pair of crushing plates indicated respectively at 2 and 3.

The crushing plate shown at 2 is a stationary or fixed plate that is disposed vertically and is provided at its lower end with a horizontal base plate 4 that is bolted or is otherwise firmly secured to a pair of spaced and parallel channel bars indicated respectively at 6 and 7. The plate 4 and a platform shown at 21 serve to maintain the channel bars 6 and 7 in their spaced and parallel relationship. Gusset plates 8 extend between the plate 2 and the base plate 4 to maintain the crushing plate 2 in its vertical position and to maintain it to resist the pressure imposed on a can when the can enters into the space between the two crushing plates 2 and 3 in the manner indicated in FIG. 4.

Secured to the underside of the base plate 10 are guide blocks 11 and 12 FIG. 3), these blocks having grooves at 13 to slidably engage with ribs 14 bolted or otherwise fastened to the channel bars 6 and 7. The base plate 10 which rests on the tops of the guide blocks 11 and 12 is slidable back and forth thereon, thereby imparting a reciprocating movement to the plate 3 to bring it to and from the crushing plate 2. Each can entering between the crushing plates 2 and 3 is thus alternately compressed and released. Channels

6 and 7 to which is fastened the ribs 14 clears the underside of the slide block 10.

Secured to the underside of the slidable base plate 10 and guide blocks 11 and 12 FIG. 3), the blocks being grooved at 13 to slidably engage with ribs 14 bolted or otherwise fastened to the channel bars 6 and 7.

Extending between the gusset plates 9 is a shaft 15 that passes through a bearing 16 on one end of an eccentric connecting rod 17 that is eccentrically connected at its other end to a driven shaft 33 mounted in bearings 19 and 20 secured on the top of the platform 21 that is fastened to the tops of the channel bars 6 and 7.

The shaft 33 carries a pulley 22 which receives a belt (not shown) that extends from a pulley on the shaft of an electric motor of from a gear box driven by the motor. The motor may be mounted on the platform 21 or otherwise convenient and any other source of power than an electric motor might be used.

It will be apparent that when the pulley 22 is rotated, the movable crushing plate 3 will be moved to and from the fixed crushing plate 2 and any can or cans that enter between the plates 2 and 3 will be crushed and flattened. when the lowermost can located between the plates 2 and 3 is forced down by gravity and by cans which follow it, the lowermost can reaches the slot 29 at the lower end of the crushing plates 2 and 3 to be finally compacted in such slot and upon the next separation of the crushing plates 2 and 3, the can will fall down through the slot 29 to be collected into a suitable receptacle that can be positioned below the apparatus.

A fly wheel 30 attached to the pulley end of shaft 33 provides uniform movement to the movable crushing plate 3. Protective guard (not shown) may also be provided to cover the fly wheel.

The opposing faces of the crushing plates 2 and 3 can be toothed, serrated or otherwise roughened as shown at 34 to prevent the cans from attempting to rise upwardly when a movable crushing plate 3 moves toward the fixed crushing plate 2. Also, the space between the plates 2 and 3 can be closed at its opposite ends by closure plates 36 carried by the fixed crushing plate 2 to thereby prevent cans from moving sidewisely out of the spacing. These closure plates 36 are shown in FIG. 1 but are omitted from the other figures for simplicity in illustration.

In the operation of the described apparatus, the unflattened cans descend from the hopper 1 and then fall into the tapering space between the stationary crushing plate 2 and the reciprocating crushing plate 3. As the crushing plate 3 moves back and forth to and from the crushing plate 2 under the action of the eccentric drive, it alternately applies pressure on the cans and then relieves the pressure and during the relief of the pressure the cans will drop down further in the space between the crushing plates to finally reach the slot 29 and there be flattened. As the jaw or plate 3 moves away from the crushing plate 2, the flattened can will drop through the slot 29 to fall into a collection receptacle located below the slot 29. The action of the apparatus is automatic, one can after another being flattened as above described and then released and collected.

The crushing apparatus is of such size that it can be mounted directly on a small truck, which can be readily moved from place to place wherever cans are available. It is, therefore, not necessary to collect the uncrushed cans and move them to the location of the crushing ap-

paratus. The cans once crushed to about one-sixth their size can then be loaded into trucks or freight cars for shipment to the recovery unit.

What I calim is:

1. An apparatus for crushing and flattening cans or similar articles comprising, a pair of spaced channel bars, plates disposed on top of said bars and serving to hold the bars coupled together in spaced, parallel relation, one of the plates supporting a vertically-disposed and fixed crushing plate, a slide movable along the top of the bars between the plates, said slide carrying a crushing plate that is fixed and non-pivotal with respect to the slide, said slide-borne plate being disposed at an angle with respect to the fixed crushing plate, said slide-borne plate maintaining constant angularity with respect to the fixed plate during the sliding movement of the slide, a driven shaft, eccentric means disposed between said shaft and the slide-borne plate to impart a reciprocating movement to the slide and slidably and non-pivotally move its plate to and from the fixed crushing plate to thereby alternately impart and release pressure on cans that enter between the curshing plates.

2. An apparatus for crushing and flattening cans and

similar articles comprising, a pair of spaced channel bars, plates disposed on top of said bars in spaced relation, one of the plates supporting a fixed, vertically-disposed crushing plate, a slide movable along the top of the bars in the space between the plates, said slide carrying a movable, non-pivotal crushing plate having a crushing surface disposed at a constant and uniform inclination with respect to the face of the fixed crushing plate, said movable plate being fixed in reference to the slide so that it maintains constant inclination and angularity in respect to the fixed crushing plate during its sliding movement to and from the fixed crushing plate and during the crushing operation, a driven shaft, eccentric means disposed between said shaft and the movable crushing plate to impart a reciprocating movement to the movable crushing plate and slidably and non-pivotally move it to and from the fixed crushing plate to thereby alternately impart and release pressure on the cans that enter between the crushing plates, the movable plate being reinforced by gussets, which gussets serve as bearing supports for one end of the driven shaft.

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