Aug. 7, 1962 A. R. GUEDEL 3,048,096

APPARATUS FOR FLATTENING CONTAINERS

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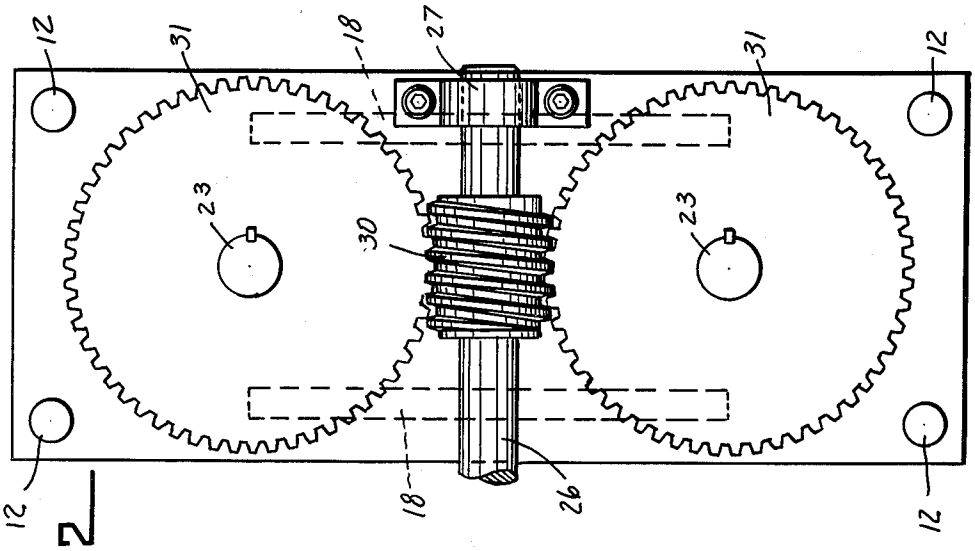


FIG. 2

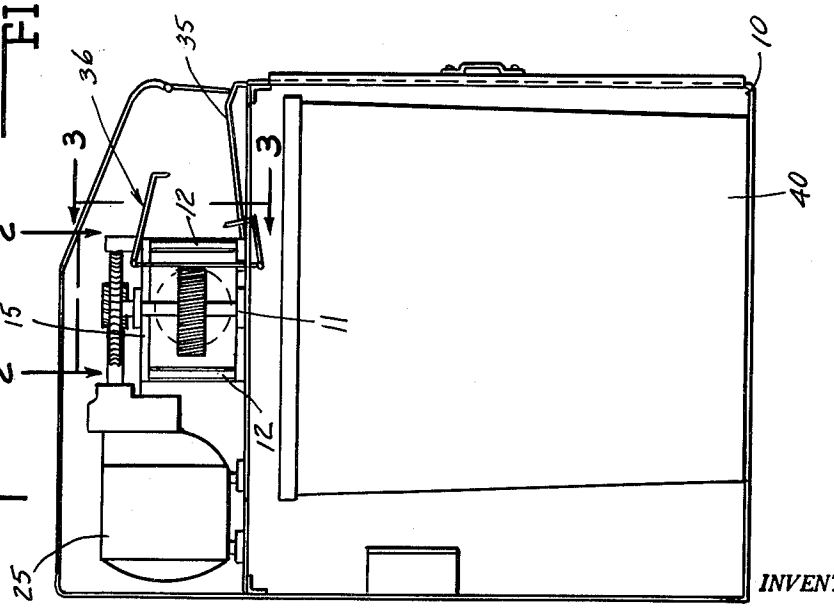


FIG. 1

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FIG. 3

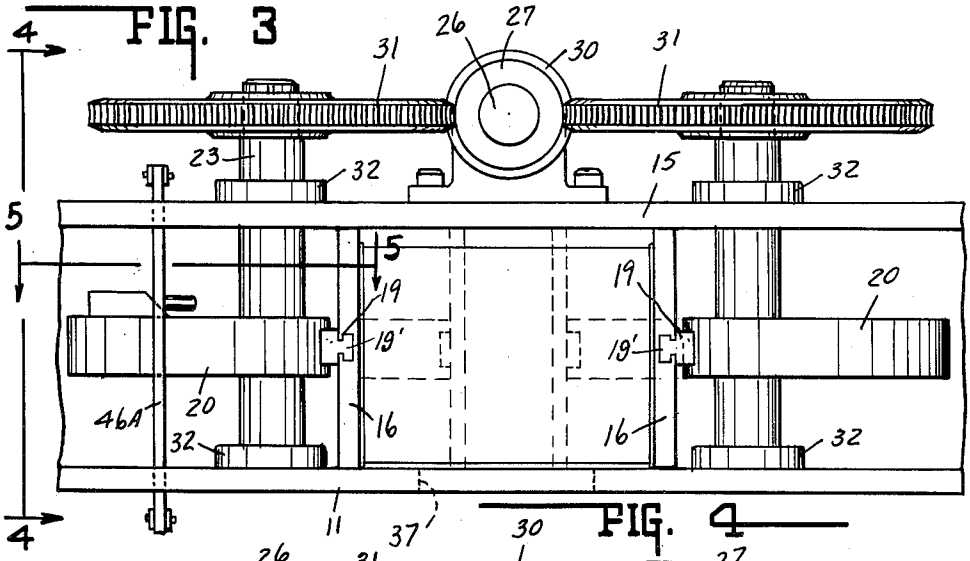


FIG. 4

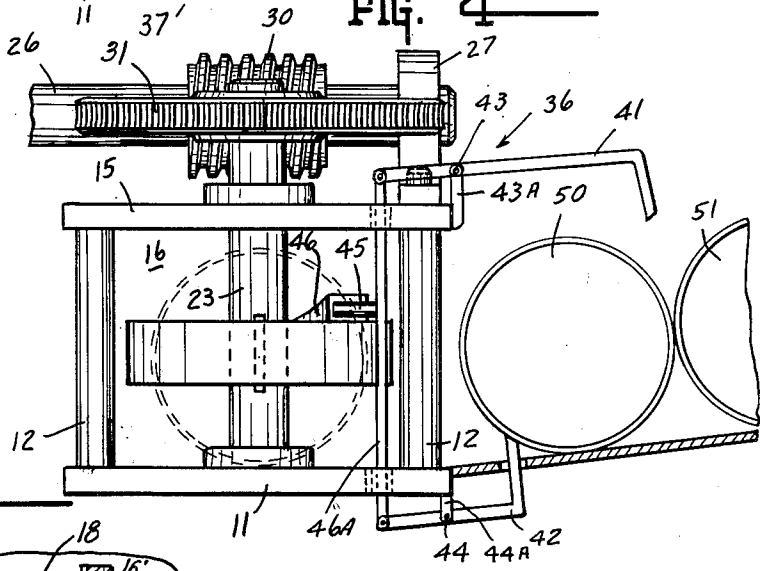


FIG. 5

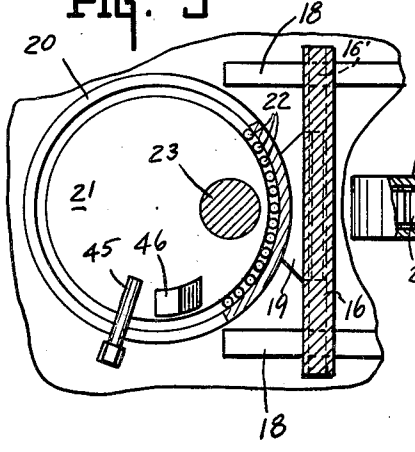
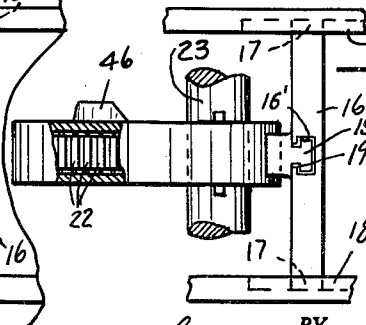


FIG. 6



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APPARATUS FOR FLATTENING CONTAINERS

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2 Claims. (Cl. 100—215)

The present invention relates to apparatus for flattening or compressing objects such as tin cans.

One well known reason for the increasing use of cans as containers in place of bottles is the cost involved in picking up and hauling the empty bottles and in cleaning the bottles in preparation for reusing. Bottles are frequently used, however, at least partly because the empty cans take up space. Certain devices are known for crushing or flattening cans, however, for various reasons these devices have not proven to be completely satisfactory.

It is, therefore, an object of the present invention to provide an improved apparatus for flattening objects.

A further object of the present invention is to provide an apparatus for flattening containers which may be loaded at irregular intervals with relatively large numbers of cans and which will automatically crush the cans and drop them into a refuse container.

Still further objects and advantages will appear as the description proceeds.

In accordance with the present invention, there is provided an apparatus for flattening cylindrical objects such as tin cans, the apparatus including a horizontal base plate and a pair of pressure plates mounted for horizontal reciprocation upon the base plate. Means are provided for reciprocating the plates toward and away from one another. An inclined guideway which leads to the base plate functions to channel the cans between the pressure plates. The base plate is provided with an aperture therethrough which is only sufficiently large enough to allow the cans which have been compressed by the pressure plates to drop through the aperture. There is also provided means actuated by the reciprocating means for feeding one can between the plates each time the plates are reciprocated.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

FIG. 1 is a side elevation of a container flattening apparatus embodying the present invention showing the apparatus with the cover portions thereof removed for illustrating the working parts of the apparatus.

FIG. 2 is an enlarged top plan view taken along the line 2—2 of FIG. 1 in the direction of the arrows and showing certain gears and associated mechanism forming a part of the apparatus.

FIG. 3 is an enlarged fragmentary vertical section taken along the line 3—3 of FIG. 1 in the direction of the arrows with certain parts broken away for clarity.

FIG. 4 is an enlarged fragmentary view similar to FIG. 1 taken along the line 4—4 of FIG. 3 and in the direction of the arrows.

FIG. 5 is a fragmentary horizontal section taken along the line 5—5 of FIG. 3 and in the direction of the arrows.

FIG. 6 is a fragmentary side elevation of the structure illustrated in FIG. 5.

Referring now to the drawings, this invention comprises a frame 10 upon which is mounted a horizontal base plate 11. Fixed to the base plate 11 are four vertical stanchions 12—12, each of which has fixed to its upper end a horizontal plate 15, the plates 11 and 15 being arranged in a parallel relationship. A pair of horizontally reciprocal pressure plates 16 are mounted by means of projecting portions 17—17 within suitable tracks 18—18 in such a manner that the plates may be moved toward and away from one another.

Each of the pressure plates 16 has connected thereto,

by means of connecting bars 19, an annular member or race 20. Each connecting bar 19 has a T-shaped head 19' formed thereon which is received in a slot 16' of T-shaped cross section opening on the rear of the pressure plates 16. Each of the annular members 20 is rotatably and coaxially mounted upon a wheel 21, the mounting being accomplished by means of needle bearings 22—22 received between the race and the wheel. Each of the wheels 21 is fixed to a shaft 23 located eccentrically with respect to the axis of the wheel. Means, which will be described below, are provided for rotating each of the shafts 23 synchronously in such a manner that, as each wheel 21 rotates eccentrically about the axis of the shaft 23, the pressure plates 16 are caused to reciprocate between the position in dotted lines and the position in solid lines in FIG. 3, each of the plates 16 moving farthest toward the other plate at the same instant and each of the plates moving the farthest from the other plate at the same instant.

A motor 25 which may be, for example, an electric motor, is mounted upon the frame 10. The drive shaft 26 is of the motor is received within and extends through suitable bearings 27 and has fixed thereto a worm 30 arranged for driving worm gears 31—31, each of which has the same number of teeth whereby one rotation of one of the gears 31 will occur during the same time interval as a single rotation of the other gear 31. Each of the gears 31 is fixed to a respective one of the shafts 23 which are received within suitable bearings 32—32 fixed to the horizontal paltes 11 and 15. It can be seen that the above structure provides means for positively driving each of the eccentrically mounted wheels 21 synchronously and in such a manner that each wheel will move through a rotation in the same time interval and in phase with the other such wheel.

The apparatus is provided with an inclined guideway 35 which may extend any desired distance so as to accommodate any desired number of cans. A feeding or metering device, indicated generally by the numeral 36, functions to allow the foremost can received within the trackway 35 to enter between the pressure plates 16 each time the pressure plates move through a complete reciprocation. After each can has been compressed or flattened by the pressure plates, it is allowed to drop through an aperture 37 in the horizontal base plate 11 to be received within a refuse container 40 within the lower portion of the apparatus. The aperture 37 is only of a sufficient size that a can will drop therethrough after it has been flattened or compressed by the pressure plates.

The feeding or metering device 36 includes a pair of stop members 41 and 42 which are pivotally mounted at 43 upon the mounting member 43A and at 44 upon the mounting member 44A, respectively. Mounting members 43A and 44A are fixed to plates 15 and 11, respectively. A cam roller 45 is rotatably mounted upon a vertical rod 46 which has its upper end pivotally connected to the stop member 41 and has its lower end pivotally connected to the stop member 42. The cam roller 45 is actuated or raised each time the wheel 21 (the leftward wheel as viewed in FIG. 3) rotates through a complete revolution by means of the cam 46 which projects upwardly from the upper surface of the wheel.

Referring to FIG. 4, the feeding or metering apparatus 36 is shown in its non-actuated position wherein the stop member 42 is blocking the path of the foremost can or container 50 and the stop member 41 is out of the path of the containers received on the guideway 35. When the roller 45 is actuated by the cam 46, the lower stop member 42 pivots downwardly allowing the cam 50 to enter between the pressure plates 16. At the same time as the stop mmber 42 pivots downwardly, the stop member 41 is also pivoted downwardly into the path of the

next succeeding can 51, thus preventing the can 51 from entering between the pressure plates. It should be noted that the cam roller 45 will be actuated only when the pressure plates have reached or at least are near, their widest extension from one another. The wheel 21 will continue to rotate until the cam passes from below the roller 45 whereby the two stop members will pivot upwardly. The upward movement of the stop member 41 allows the can 51 to move down the inclined guideway. The simultaneous upward movement of the stop member 42 prevents the can 51 from moving between the pressure plates and holds the can in readiness for the next cycle of the apparatus.

It can be seen that the present invention provides an apparatus for flattening containers which may be loaded at irregular intervals with relatively large numbers of cans and which will automatically crush or flatten tin cans and drop them into a refuse container.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiment has been shown and described and that all changes and modifications that come within the spirit of the invention and the scope of the claims are also desired to be protected.

The invention claimed is:

1. An apparatus for flattening containers which comprises a horizontal base plate, a pair of pressure plates mounted for horizontal reciprocation toward and away from one another upon said base plate, a pair of annular members, a wheel mounted coaxially within each annular member for rotation about the axis of the wheel with respect to the respective annular member, each of said annular members being connected to a respective one of said pressure plates, each of said wheels being mounted for eccentric rotation in a plane parallel to the direction of reciprocation of said pressure plates, means for synchronously driving said wheels in such a manner that each pressure plate moves the farthest toward the other pressure plate at the same instant and in such a manner that each pressure plate moves the farthest from the other pressure plate at the same instant, an inclined guideway leading downwardly to said base plate for channeling containers between said pressure plates, said base plate having an aperture therethrough only sufficiently large enough to allow containers compressed by said pressure plates to drop through said aperture, said aperture being located below the path of reciprocation of said pressure plates, and means including a cam on one of said wheels for releasing a container on said guideway for gravity feed between said pressure plates each time said pressure plates are reciprocated.

2. An apparatus for flattening cylindrical containers which comprises a horizontal base plate, a pair of parallel vertical pressure plates mounted for horizontal linear reciprocation toward and away from one another upon said base plate, a pair of annular members, a wheel mounted coaxially within each annular member for rotation about the axis of the wheel with respect to the respective annular member, each of said annular members being connected to a respective one of said pressure plates, a pair of vertical shafts each rotatably mounted on said base plate and each fixed to a respective one of said wheels at equally spaced locations from the axes of said wheels, a pair of identical side-by-side worm gears fixed coaxially of respective ones of said shafts, a worm positioned between and in driving engagement with each of said worm gears, said pressure plates and worm gears being operatively connected in such a manner that each pressure plate moves the farthest toward the other pressure plate at the same instant and as a result moves the farthest from the other pressure plate at the same instant, means for rotating said worm, an inclined guideway leading to said base plate for channeling containers between said pressure plates, said inclined guideway intersecting the path of reciprocation of said pressure plates so that the axis of a cylindrical container rolling thereon and therefrom onto said base plate is parallel to said direction of reciprocation, said base plate having an aperture therethrough only sufficiently large enough to allow containers compressed by said pressure plates to drop through said aperture, said aperture being located below the path of reciprocation of said pressure plates, and means including a cam on one of said wheels for releasing a container for gravity feed between said pressure plates each time said pressure plates are reciprocated.

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