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MEANS FOR FLATTENING CANS

3,066,600

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FIG. 1

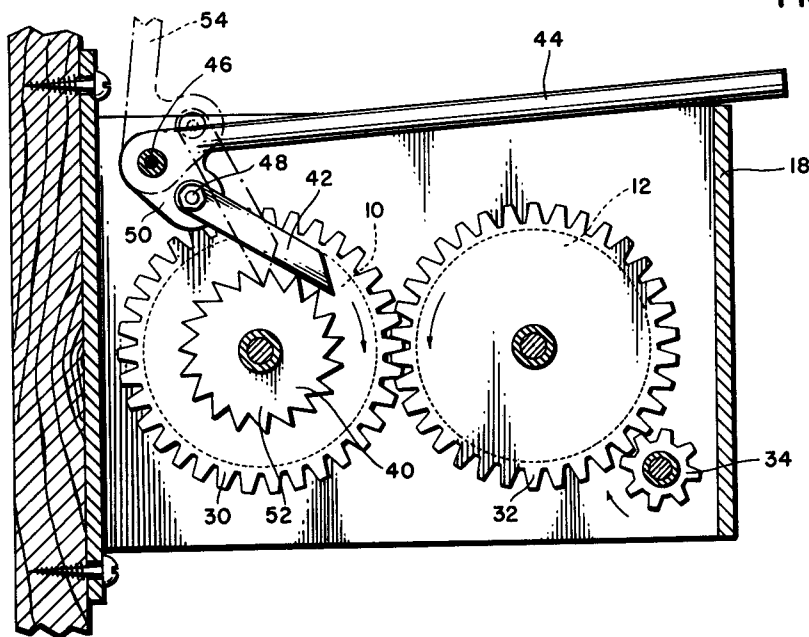


FIG. 4

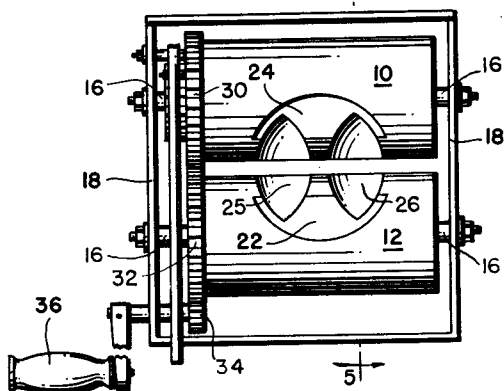


FIG. 2

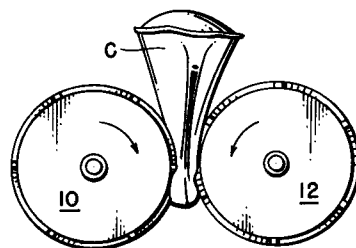


FIG. 5

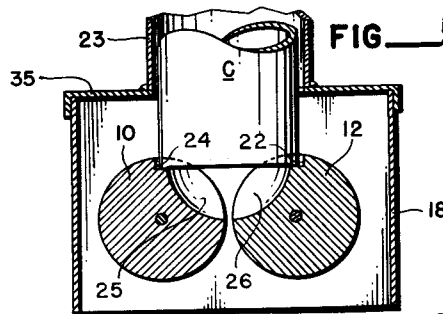
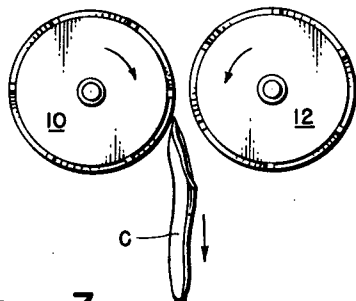


FIG. 3



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MEANS FOR FLATTENING CANS

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5 Claims. (Cl. 100—176)

This present invention is characterized by means adapted to engage one end of a tin can between configured rollers and to then pass the can through the rollers; much after the fashion of a wringer used for clothes, so that the can is flattened and thus presents greatly reduced volume.

The collection and disposal of garbage is gradually becoming a more and more complex and aggravating problem. Garbage is normally divided into such articles as burnable garbage, food materials that have proved value and may be salvaged for certain types of livestock or may be disposed of by incorporation into sanitary fills and unburnables such as bottles and cans. The bulk of the volume today, however, consists of these tin cans and bottles, of which the bottles are presently being salvaged in many parts of the country for the glass they contain or for re-use. However the tin can has for the present no apparent salvage value. Tin cans, because of their relatively short life under ground cannot be employed in sanitary fills without being crushed or flattened and this use is not particularly desirable due to the fact that as the cans rust away there is a marked tendency for the fill to settle with all the attendant problems that may result, especially when the property may later be required to bear the weight of buildings.

Many communities employ incinerators for a great portion of their garbage, in which case normally the burnables are employed to dry out and burn many of the food wastes. However, the problem of sorting garbage is a very difficult and expensive one but if the tin cans are not sorted out of the average incinerator it soon becomes filled to a point where the operation must be shut down until the tin cans are cleaned out of the incinerator.

Tin cans form a great portion of the bulk of the garbage as it is picked up from the average home, restaurant and the like adding materially to the cost of garbage collection. This is particularly noted by home owners where garbage is collected on the basis of so much per full garbage can. In many communities ordinances have been passed requiring the crushing or flattening of tin cans just to overcome some of the bulk in handling, it being estimated that the ordinary hand hammered tin can will easily be reduced to one tenth of the bulk it occupied in its normal state. There is ever indication that local ordinances of this order will gradually come into more general use as the garbage collection and disposal problem becomes more acute. In the past numerous devices have been produced for the crushing and flattening of tin cans but of these, those which have been inspected have been bulky, costly devices intended more for commercial establishments than for the home. In this present invention means are provided for crushing and flattening various types of cans and doing it by means so simple in construction that they can easily be operated by the

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housewife. This simplicity of construction also keeps the cost well within the ordinary household budget.

The principal object of this present invention therefore, is to provide a can flattening device of economical construction which can be operated with ease by the average housewife.

A further object of this invention is to provide means employing spaced apart rollers which are configured so as to grip tin cans of the type used as food containers, and carry them through the reduced space between the two rollers and thus effect their flattening with a minimum of effort and in a substantially uniform manner.

A further object is to provide a means for flattening cans which lends itself to a wide range of capacity requirements so that it may be built either in a form particularly suitable for household use, in which case it would be normally manually operated, or the equipment may be power operated and increased very appreciably in size so as to take care of a greater volume such as might be required in larger residences, commercial establishments, restaurants and the like.

A further object of this present invention is to provide means for flattening various forms of cans, particularly of the type employing non-ferrous metals such as aluminum, in which it is possible to make the can as a die drawing in which method the can is normally die-formed without any bottom reinforcing rim. This new form of construction can be easily engaged by a modified type of roller configuration and the cans thus made economically available for salvage.

A further object of this invention is to provide a means which will flatten cans in a manner particularly facilitating the salvage of the metal from which the cans are made.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

In the drawings:

FIGURE 1 is a vertical cross-sectional view illustrating the drive means employed to revolve the two rollers in their can flattening operation.

FIGURES 2 and 3 illustrate respectively two steps in the can flattening operation, the rollers being shown in diagrammatic form.

FIGURES 4 and 5 are a top plan view and a vertical cross-sectional view respectively, FIGURE 5 being taken along the line 5—5 of FIGURE 4 illustrating a form of roller configuration for use with metal cans not employing a pronounced bottom rim as well as conventional cans.

Referring more particularly to the disclosure in the drawings, the numerals 10 and 12 designate respectively the two rollers as they are normally employed in the simplest form of our device. They are provided with suitable horizontally aligned journals 14 which in turn are supported on suitable bearings, the preferred form being of the prelubricated type of anti-friction bearing indicated at 16.

Bearings 16 are suitably supported in a common frame as 18 so as to provide against any separation of the rollers during the can flattening operation. Rollers 10 and 12 are configured on their outer surface so as to form engaging means for the cans being crushed or flattened.

To form engagement means for the cans to be crushed or flattened there are cut into the cylindrical surfaces of each of the rollers 10 and 12 two sets of segmental depressions, 22 and 24 having their major axes longitudinal of the rollers and 25 and 26 having their major axes at right angles to the axes of the rollers. An arrangement of this order has found to be very desirable, particularly in flattening the new form of aluminum cans which are formed by a press drawing operation so that there is no outstanding rim on the bottom of the can. It is of course necessary that the can be properly introduced to these two segmental depressions and this can be done manually, or in a power operated machine a feeding chute 23, such as is shown in FIGURE 5, is required.

The rollers 10 and 12 are provided with segmental depressions 22 and 24. These depressions may be considered as being cut by an end milling operation when the rollers are positioned as viewed in FIGURE 5. Such an operation produces a partial planar surface as shown in FIGURE 4. Where the cuts bite deeply into the cylindrical surfaces of the rollers, vertical abutments 25 and 26 are provided which are high enough to securely engage the can base, after the showing of FIGURE 5. Segmental depressions as used herein refers to planar cuts, made in the cylindrical surface of the rollers 10 and 12 which are deep on one margin and run out to nothing when something less than a semi-circular cut is made.

It is necessary that rollers 10 and 12, following the principle of clothes wringers, for instance, turn toward each other and at the same rotative speed; consequently gears are provided of equal size indicated at 30 and 32. These gears may be formed integral with rollers 10 and 12 or may be separately produced and secured thereto, depending of course on whether the rollers are fabricated from metal tubing and the like or are cast of metal or molded of some of the firm plastic materials.

Some suitable form of power application is required to revolve rollers 10 and 12 and throughout the present drawings the simplest form has been employed in which a small gear pinion 34 mounted on suitable bearings engages one of the two gears, and thereby drives the other gear with its attached roller. For ordinary home use where it is desirable to use simplest form of this machine, a hand crank 36 is employed. Such a drive arrangement keeps the equipment simple and adds immeasurably to the safety of the equipment in that the person feeding the cans into the machine is also operating the power input. In the more complicated forms of this equipment, where larger capacities are required, suitable power drive means, as an electric motor, may be connected to the shaft on which pinion 34 is secured. With such an arrangement however, it is desirable to enclose the rollers so that an operator's hand cannot be caught between the two power driven rollers. Such cover arrangement 35 is illustrated in the sectional view of FIGURE 5.

Normally, and especially for the crank operated form of the machine, it is desirable to have the mechanical advantage calculated to the extent that three or four turns of crank 36 at most will perform the can crushing or flattening operation, though sometimes a can having a rim of unusual thickness may be encountered and greater mechanical advantage be required. A preferred solution of this problem is illustrated in FIGURES 1 and 4 particularly and consists of a one-way ratchet 40 which is secured to roller and gear assembly 10 and 30. Adapted to operatively engage ratchet 40 is a pawl 42. Pawl 42 is operated by means of lever 44, which is revolvable about the fixed pivot 46. Pawl 42 is pivoted at 48 to a boss extending downwardly from lever 44, in a bell crank arrangement as illustrated at 50. With lever 44 in its lower position, as illustrated in FIGURE 1, pawl 42 lies

on the outer tips of ratchet teeth 52 without operatively engaging them and normally will make no noise and will not produce any wear in ratchet 40. When, however, lever 44 is raised to the dotted line position indicated at 54 in FIGURE 1, the pawl then engages one of the teeth and as lever 44 is brought downwardly it will revolve roller 10 an amount equivalent to one or two teeth of the ratchet, depending somewhat on the proportioning and mounting of pawl 42. This has been found to be adequate as usually any extreme resistance is encountered only at the point of crushing one of the heavy rims of a tin can, and once this is crushed by a slight angular movement of the rollers the normal drive means, as crank 36 is then adequate to carry the load and complete the can flattening operation.

In the foregoing description and the drawings illustrating the same we have indicated for clarity of understanding the simplest form of this present equipment. It is believed that it will be apparent that for greater capacity and greater speed of operation it will be desirable to modify this present construction considerably in order that the equipment may most fully meet its operational requirements.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of means for flattening cans.

Having thus disclosed the invention, we claim:

1. A can flattening device for flattening cans having end rims comprising: a plurality of spaced can flattening rollers having journals axially disposed at the end of each roller to form a roller assembly; a unitary supporting framework for said journals adapted to insure a predetermined positioning of said rollers during period of use; a continuous, manually operated drive means for each roller consisting of gears adapted to operatively engage and provide opposite rotation for each coacting pair of said rollers and thus insure that the rollers will both move a can, disposed between the rollers, in the same direction; said rollers having coacting surfaces configured to engage the major portion of the end rim of a can to be flattened and diametrically disposed wall portions adjacent the engaged end to insure its passage between the rollers.

2. The subject matter of claim 1 in which said can engaging configuration includes two generally segmental shaped depressions, one depression on the surface of each of said rollers, each depression being adapted to engage substantially one half of a cylindrical can end rim, said depressions each presenting a substantially planar common rest surface for the can at the time of engagement of the can end, and a feeding chute adapted to insure proper presentation of the can to the flattening rolls.

3. The subject matter of claim 1 in which said can engaging configuration includes two generally segmental shaped depressions, one depression on the surface of each of said rollers, each depression being adapted to engage substantially one half of a cylindrical can end rim, said depressions each presenting a substantially planar rest for the can at the time of engagement of the can rim guide means adapted to insure proper presentation of the can to the flattening rolls and auxiliary drive means adapted for selective employment to provide greater torque to said rollers as compared to said first manually operated drive means to overcome unusual resistance encountered by said rollers in flattening a can.

4. The subject matter of claim 1 in which said roller surfaces are configured as generally segmental shaped depressions which, together, at one point in the rotation of the rollers form an interrupted planar surface, one half of said surface being on each roller, such surfaces being cut into the cylindrical surface of each of the rollers on a plane parallel to the longitudinal axis of said rollers, said depressions having side walls at right angles to the planar surfaces which are high enough to securely engage the base rim of a cylindrical can, the adjacent edges of said

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planar cuts in said combined planar position running out to nothing at their adjacent edges.

5. The subject matter of claim 4 in which a one-way ratchet wheel is secured to one of said rollers, a pawl disposed to operatively engage said ratchet wheel and a lever for manual operation operatively connected to said pawl.

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