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J. GRAHAM

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CAN CUTTING AND CRUSHING APPARATUS

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Fig. 1.

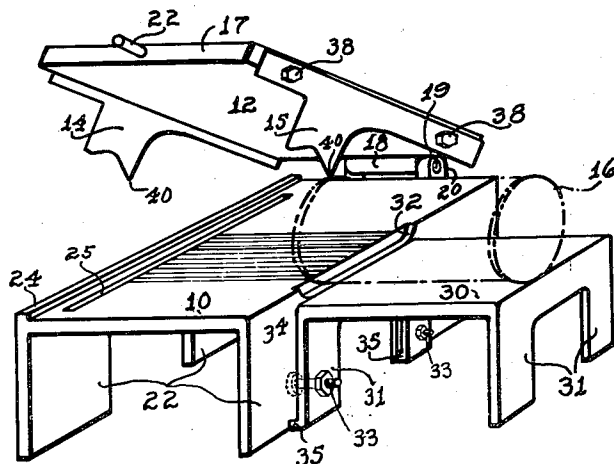


Fig. 2.

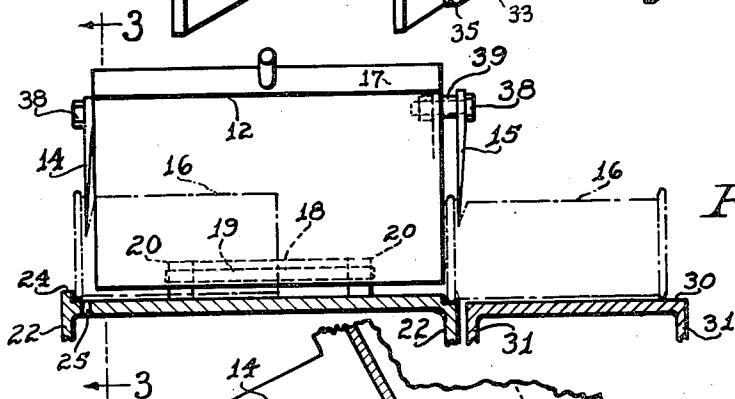
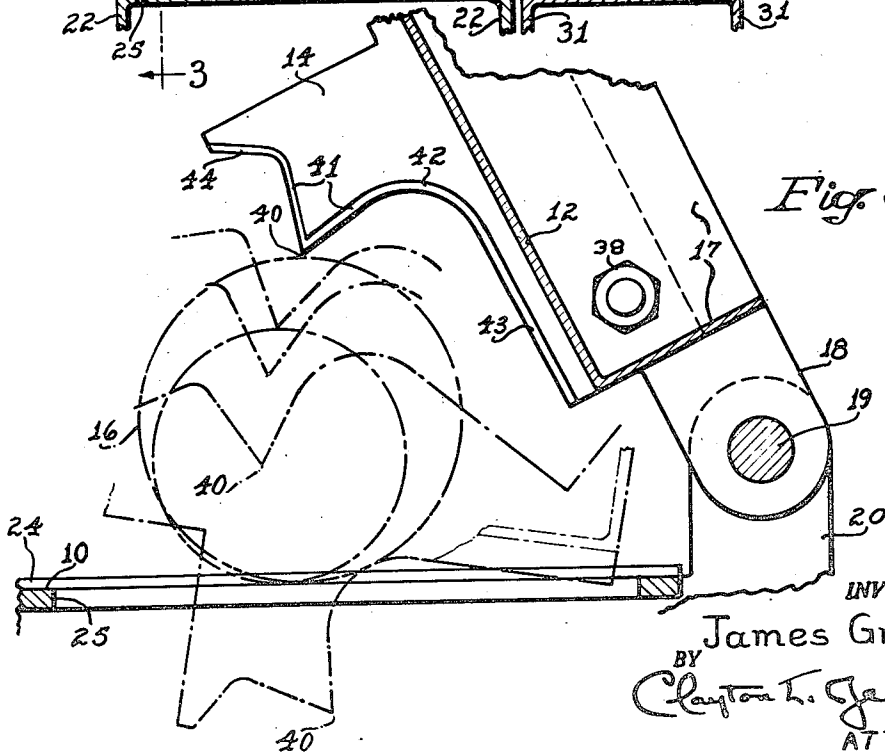


Fig. 3.



INVENTOR.

James Graham

BY

Clayton L. Jenkins

ATTORNEY

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## CAN CUTTING AND CRUSHING APPARATUS

James Graham, West Boylston, Mass.

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3 Claims. (Cl. 153-10.5)

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This invention relates to can crushing apparatus and particularly to a device which will permit the ready disposal of many types of tin cans that accumulate in the average household kitchen.

A large problem is faced by the average householder in a need for disposing of the empty cans which have contained food, since they are usually made of incombustible material that cannot be placed with garbage and other refuse, and they must be removed separately from the house. Owing to their large bulk and the assortment of sizes involved, they may require large disposal receptacles and vehicles for the transportation of a comparatively small number of cans. On the other hand, if they could be put into a compact form and thus easily transported, there would be a larger possibility of subjecting the cans to a de-tinning process and thus recovering valuable metal for reuse.

A primary object of this invention is to satisfy such requirements and to provide a simple, economical and easily operated apparatus which may be employed in the average home for crushing the cans into a compact condition so that they may be easily stored and ultimately removed.

A further object is to provide such an apparatus which will serve to cut off one or both of the heads of the can so as to make the crushing operation easy and provide a neat and compact product.

A further object is to provide an apparatus of this type in which the cutting and crushing operations are carried on simultaneously, so that by the time that the can head, which would otherwise interfere with an orderly crushing step, has been removed, the can is crushed to the required flat condition.

A further object is to provide an apparatus of this type for cutting off one or both heads of a can and which is well adapted for the various sizes of can and requires no adjustments or operation problems and which will crush a large sized can as satisfactorily as a smaller one. Other objects will be apparent in the following disclosure.

Referring to the drawings which illustrate one embodiment of this invention:

Fig. 1 is an isometric view of the device with a can in position for cutting off one of its heads;

Fig. 2 is a front elevational view of the construction of Fig. 1 and showing in dotted outlines the two positions of a can arranged for cutting off its two ends; and

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Fig. 3 is an enlarged fragmentary sectional detail, taken on the line 3-3 of Fig. 2, showing the relation of various sizes of can to the cutting knife 14 and the operation of slicing off the can head.

In accordance with this invention, I have provided a device which will serve for slicing off one head of the can and simultaneously flatten the cylindrical portion of the can as the head is removed. This construction, which may take various forms, is shown as having a support for holding a can during the slicing operation, comprising a flat topped metal table or platform 10 to which is hinged a metal crushing plate 12. These parts may be made suitably, such as iron castings or pressed steel bodies, and their shapes may be designed accordingly. One of these members, such as the hinged plate 12, carries at least one knife 14, and preferably a second knife 15, arranged to slice through the cylindrical body of the can 16 adjacent an end. Since the can in its crushed or flattened condition will have a substantial thickness, and the flat undersurface of the crushing plate 12 in its lowermost horizontal position should be substantially parallel with the horizontal, unobstructed top flat surface of the can support 10, the pivot for the crushing plate 12 is located above the top of the support 10 so as to provide room for the crushed can when the adjacent surfaces of the parts 10 and 12 are parallel.

To this end, the hinged crushing plate 12, which has an upstanding peripheral flange 17 for strength, is provided with a projecting knuckle 18 secured to the rear flange portion, and that knuckle rides on a pivot pin 19 carried in spaced lugs 20 standing up from the rear end of the platform 10 and locating the hinge axis in the required position. This hinge construction permits the plate 12 to be rotated upwardly about the pin axis for the insertion of the can to be crushed, after which the plate 12 is moved downwardly by any suitable device, such as the handle 22 secured medially by bolt 24 and nut on the front flange 17 of the plate 12.

The platform 10 is provided with suitable legs 22 or other means of support. A stop, such as a flange 24, projects upwardly from one side of the plate 10 and serves to limit the movement of a can through the crushing zone and to hold it properly positioned so that the knife 14 may cut off the end of the can closely adjacent to the head or rim or to the end of the can having no head and at a position where the lateral strength of the can end aids in resisting any tendency

for the knife to crush the can before it can penetrate it and cut off the head properly. A slot 25 is arranged lengthwise of the platform 10 and of such size that the knife blade 14 may pass through that slot to its lowermost position and thus sever the can completely. The legs 22 are proportioned accordingly so that the knife will have room for its travel.

Since the can may have both ends attached to the cylindrical body, such as when one end has been only partly opened for removing the contents of the can, it is desirable to remove both of these ends before the final crushing stage and thus make it possible to crush the cylindrical body easily to a flat condition. To this end, the can support comprises a second can supporting platform 38, and this may be formed as a shelf secured to the table 10. As illustrated the shelf may be provided by a separate table made of pressed steel or other suitable material which has legs 31 secured to the legs 22 of the table 10 by suitable bolts 33 so that the two platforms 10 and 30 are held rigidly together. The horizontal flat top surface of this platform 30 is preferably slightly lower than the top surface of the support 10 so that a side portion of the table 10 will serve as a stop to limit endwise movement of the can and position it properly for slicing off the head adjacent to that stop. This stop may be formed by milling out a groove 32 in the flanged side of the table 10 where the leg portion 22 joins the flat top. The vertical depth of the groove may be only about the thickness of the can head. It will be appreciated that many types of can have a beaded edge and this bead has an appreciable thickness, hence the horizontal width of the groove 32 is therefore to be such that this beaded portion will be supported by the slot bottom and out of the way of the knife 15 which will pass downwardly outside of but closely adjacent to the side face 34 of the legs 22 of the table 10. The knife 15 is so located and the platform 30 is of such height and so positioned as to permit the knife to pass through the can and into the slot between the two supports 10 and 30 and to the required depth. To provide this slot space for the knife I may form in-turned lugs 35 on the inner legs of the table 30 which contact the legs 22. The lugs are slightly longer than the thickness of the knife blade 15. It will also be appreciated that the slot 25 is spaced from the flange 24 by that same distance representing the thickness of the beaded portion of the can where that type of can is used, as shown in Fig. 2, so that the knife may slice off the top close to the beaded rim.

Each knife is so shaped that it will sever the cylindrical part of the can just inside of the beaded head, and the knife 14 is so located that it will permit the cylindrical part of the can to be crushed by the crushing plate 12 without interference by the can end. The two knives may be of the same shape, and each comprises a beveled cutter element of a suitable steel which is adapted to be secured and adjusted on the appropriate upstanding end flange 17 of the crusher plate 12, such as by bolts and nuts 36 secured in holes or elongated slots in the flange. The knife or plate 14 is clamped tightly against the outer side of the flange 17 in a position to enter the slot 25. That is, the hinged crushing plate 12 is narrow enough so that its side flange 17 is located at the right of the upstanding flange 24 when in a lowermost position. The knife or cutter plate 15 is spaced from its supporting side flange 17 by a

suitable washer 39, so that the knife will be properly located for entering the slot between the legs 22 and 31 of the two can supports 10 and 30.

One suitable cutter comprises a narrow body, like a mowing machine knife, having a sharply pointed or wedge-shaped portion 40, as shown particularly in Fig. 3, adapted to penetrate the cylindrical surface of the can and to cut the same by means of its two beveled or sharpened sides 41. The V shaped cutter portion 41 merges with a beveled curved portion 42 which continues as a straight knife portion 43 running substantially parallel with the plate 12. At the other side of the wedge 40 is a further beveled cutting portion 44 that is connected through a curved part with the V cutter. The shape of the knife may be widely varied as desired.

The cutter is so shaped and the can is so located that when the can is positioned with substantially a vertical diameter contacting with the sharp point of the wedge 40, the wedge will swing downwardly through the successive positions shown in Fig. 3 and progressively cut the cylindrical body of the can. It is to be noted that for the larger circle 16 representing a large can, the flat portion 43 and the flat portion 44 of the cutter will be brought into operation for cutting down through the side portions which are close to a horizontal diameter. If a smaller can is to be cut, as represented by the smaller circle 16' of Fig. 3, this can will preferably be so placed that the cutter point 40 will be located near a vertical diameter, but in this case most of the cutting is done by the pointed part 40 and the adjacent curved portion of the cutter. It will thus be appreciated that whatever the size of the can within the limits of the construction, the pointed portion 40 of the cutter will penetrate first the top and finally the bottom portions of the can while the two side parts of the V and circular portions of the cutter will complete the operation as the cutter swings about the axis of the pivot pin 19.

The operation of the device will now be apparent. A can which has its two flat heads secured to the cylindrical body by beads is first located on the lower table 30 and with either end against the shoulder provided by the groove 32. Then, by means of the handle 22, the crusher plate 12 is moved downwardly and the pointed knife portion 40 of the blade 15 penetrates the cylindrical side of the can and progressively slices off the flat end of the can. The knife holds the can and prevents its rolling. As shown at the right hand side of Fig. 2, the can at this time is wholly outside of the path of the crusher plate movement and so is not crushed, since the plate 12 is narrower than the table 10, to the extent shown. Then the can is turned end for end and the other beaded end thereof is moved into position against the upright flange 24, and this time the knife 14 cuts off the remaining end of the can, as shown at the left hand side of Fig. 2. At the same time, the flat bottomed crusher plate 12 moves downwardly against the cylindrical part of the can and progressively crushes it, but with the cutter knife 14 acting well in advance of the plate and so severing the can end ahead of the crushing stage. Thus, the two heads are collected separately from the flattened can body, and all of the can parts may thus be readily stored in a compact arrangement.

It will be noted by inspection of Fig. 2 that the distance between the two knives 14 and 15 is greater than the length of any can to be crushed so that the knives, or any intermediate shoulder

formed by the slot 32, can not interfere with the operation of the device. If the one knife 15 is employed to cut both ends of the can, then the can will be located at the left of this knife (Fig. 2) for the second stage cutting operation, after it has been reversed end for end. However, efficient operation requires that the can be so placed that the knife 14 serves for the final stage cutting operation.

The advantages inherent in this construction and its utility will now be apparent, and it will be appreciated that many modifications may be made in the construction within the scope of this invention. Hence it is to be understood that the above description and the drawings are to be interpreted as illustrating a preferred embodiment of this invention and not as imposing limitations on the appended claims.

I claim:

1. A can crushing apparatus comprising a table having a horizontal can supporting top, a flat bottomed crushing plate hinged thereto, the pivot axis of the hinge being located above the can supporting table so that the adjacent flat surfaces of the table and crushing plate may lie in a spaced and substantially parallel relationship, a knife having a pointed edge portion carried by the crushing plate and located for cutting the cylindrical body of the can closely adjacent to the end of the can, said table providing a space into which the knife may pass as it cuts through the can to remove said end, and the hinged crushing plate being so located relative to the knife that it does not contact the can end but crushes only the cylindrical body of the can as the can end is being cut and removed.

2. A can crushing apparatus comprising a can support, a crushing plate hinged thereto, a pair of downwardly depending can piercing and slicing knives carried in a spaced relationship on

the crushing plate, said support providing space for each knife to pass entirely through the can and below the can supporting surface, means for locating the can so that the ends may be separately severed by the two knives, the first end by one knife and the second end by the other knife while the can is held in two different positions, said crushing plate being arranged to crush the cylindrical body of the can only as the second can head is being severed.

3. An apparatus according to claim 2 in which the can support has two can positioning shoulders and a slot adjacent to each shoulder for the passage therethrough of the associated knife, said slots being spaced from the shoulders by about the width of a can head so that the knife slices through the cylindrical portion of the can close to but inside of the head, each knife having a sharply pointed wedge-shaped portion merging with extensive edge portions adapted to slice entirely through the cylindrical walls of cans of different standard sizes, and said knives being so spaced that cans of standard lengths may be located therebetween.

JAMES GRAHAM.

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