

March 27, 1962

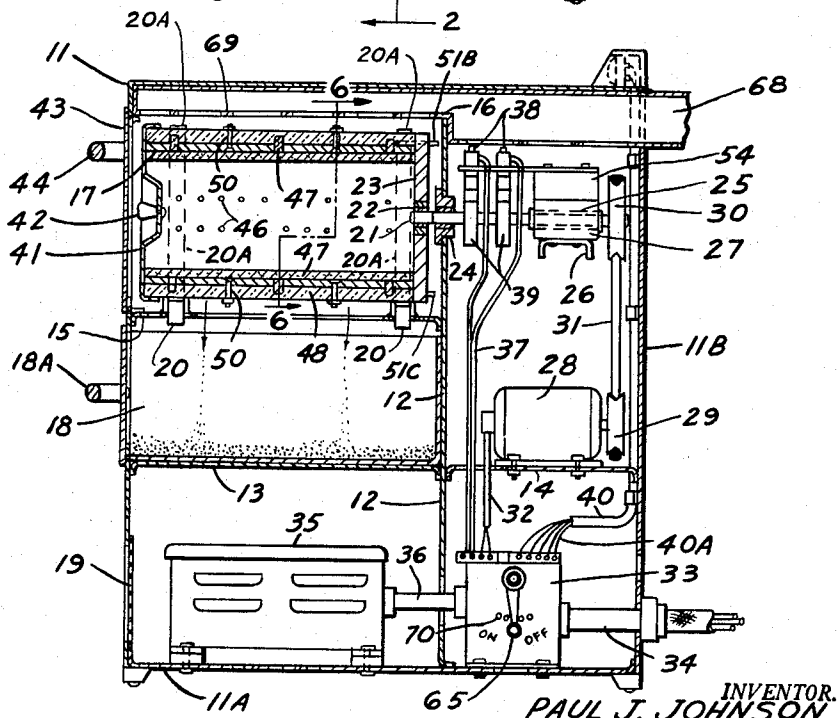
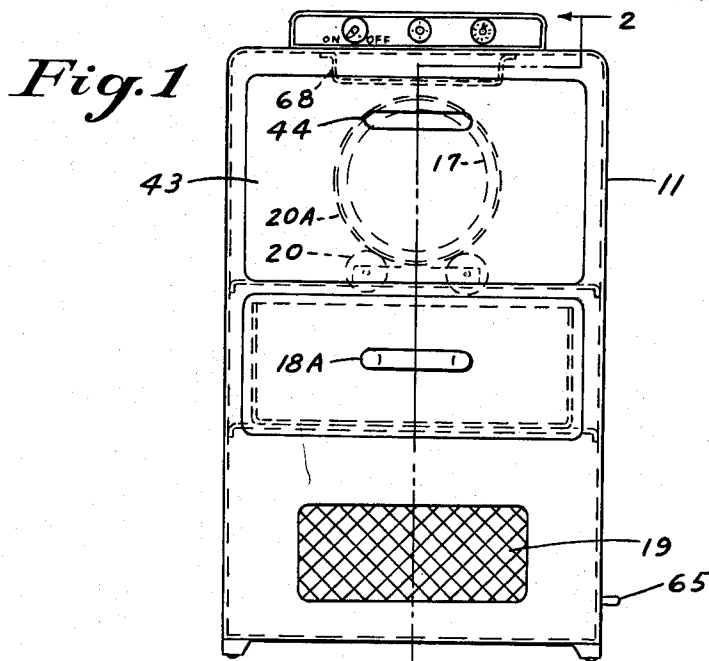
P. J. JOHNSON

3,027,445

METHOD AND MEANS FOR DISPOSING OF METAL CANS

Filed Nov. 5, 1959

3 Sheets-Sheet 1



INVENTOR.
PAUL J. JOHNSON

BY

Edward M. Apple

ATTORNEY

March 27, 1962

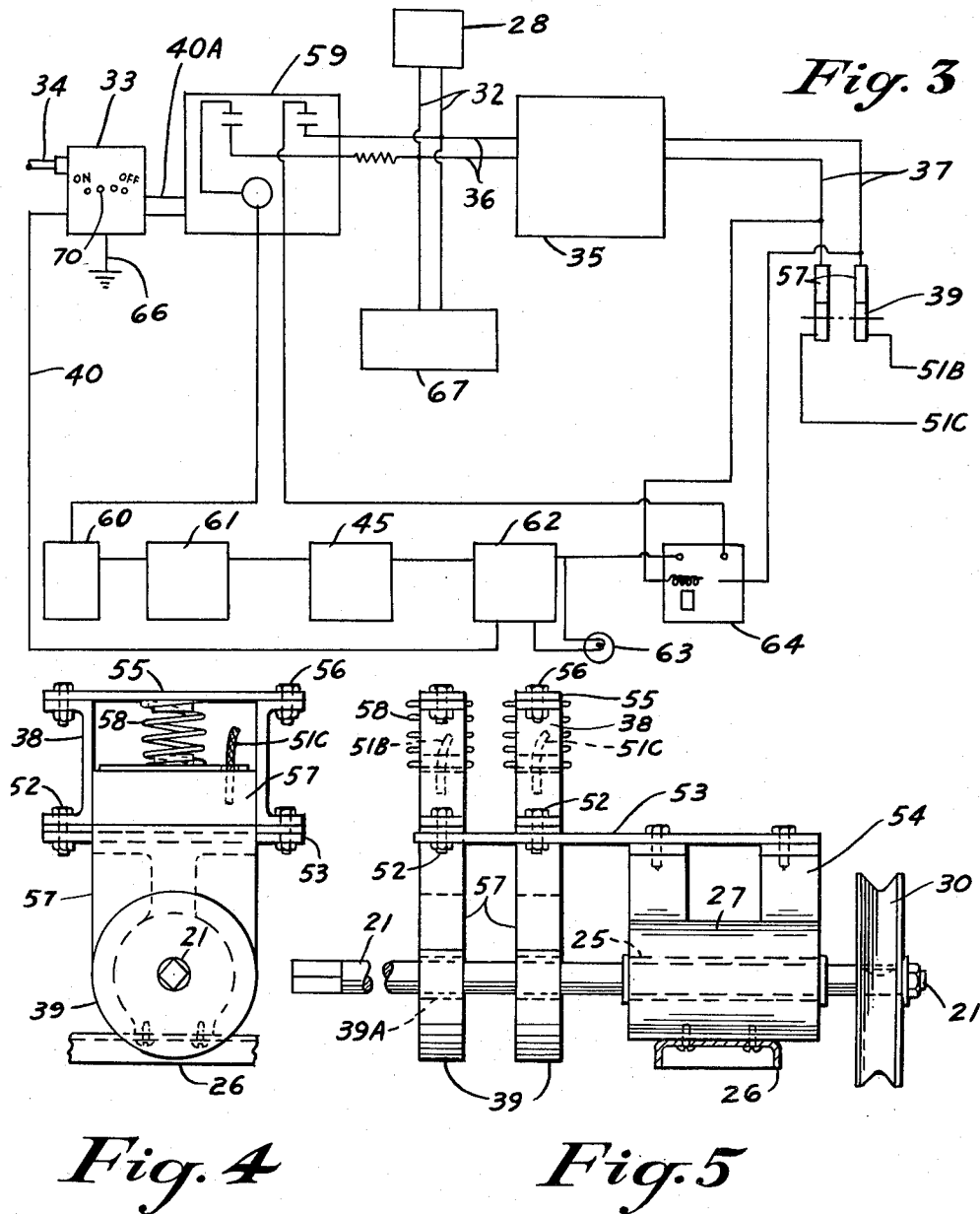
P. J. JOHNSON

3,027,445

METHOD AND MEANS FOR DISPOSING OF METAL CANS

Filed Nov. 5, 1959

3 Sheets-Sheet 2



INVENTOR.
PAUL J. JOHNSON
BY Edward M. Apple
ATTORNEY

March 27, 1962

P. J. JOHNSON

3,027,445

METHOD AND MEANS FOR DISPOSING OF METAL CANS

Filed Nov. 5, 1959

3 Sheets-Sheet 3

Fig. 6

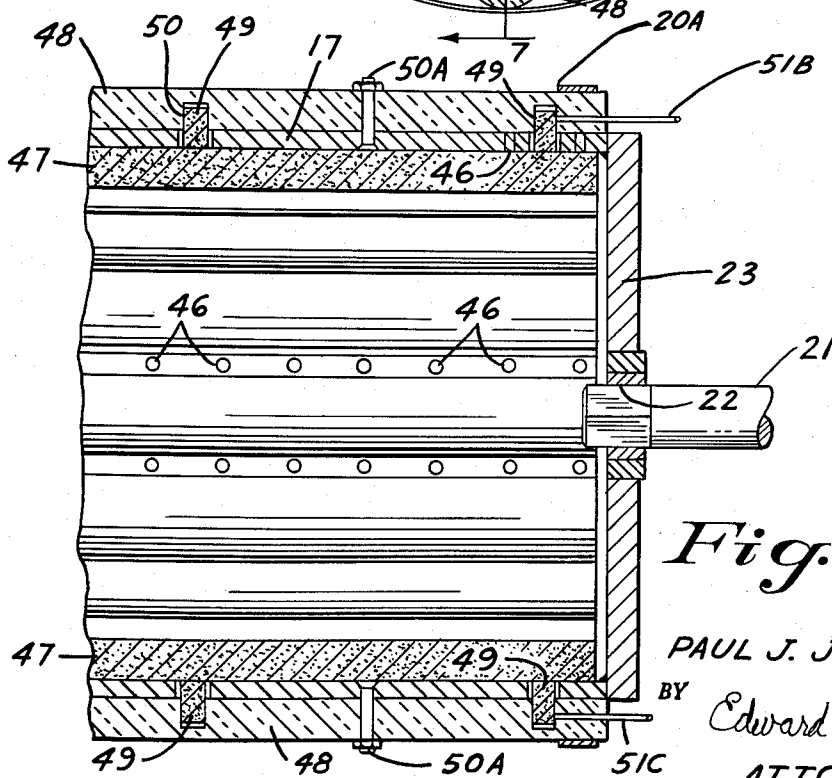
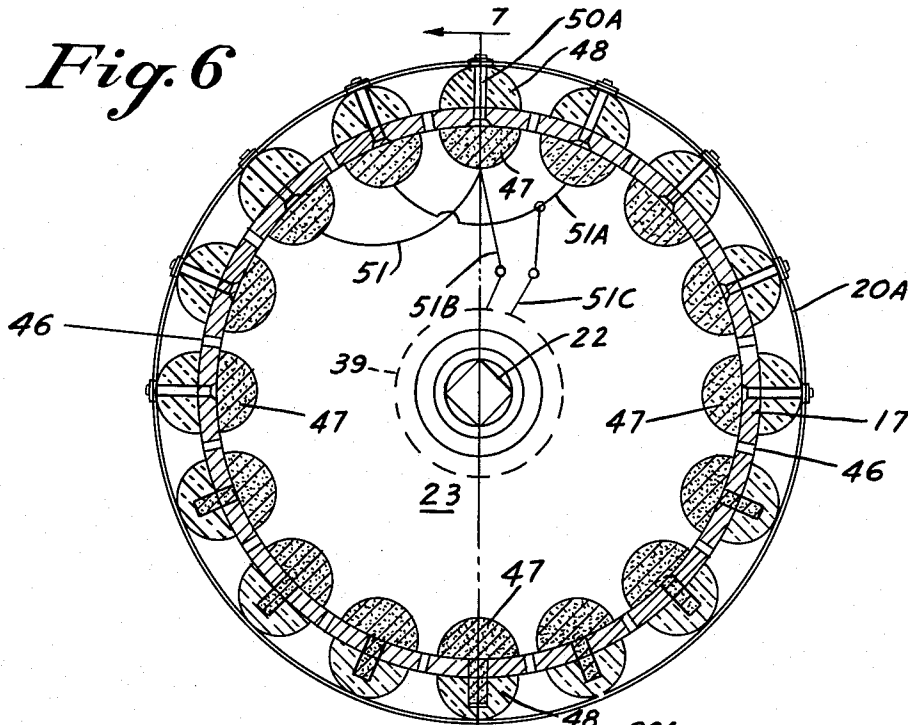


Fig. 7

INVENTOR.
PAUL J. JOHNSON
BY Edward M. Apple
ATTORNEY

1

3,027,445

**METHOD AND MEANS FOR DISPOSING
OF METAL CANS**

Paul J. Johnson, 15970 Allen Road, Milan, Mich.

Filed Nov. 5, 1959, Ser. No. 851,131

11 Claims. (Cl. 219—50)

This invention relates to a method and means for disposing of metal cans and has particular reference to an incinerator, which will dispose of tin cans, and the like, such as food products are packed in.

An object of the invention is to provide a method and means for consuming and disposing of the tin cans which accumulate in and about homes, restaurants, hotels, hospitals and the like.

Another object of the invention is to provide a device which will effectively reduce tin cans to a powder in the nature of a slag, which slag may readily be disposed of by depositing it at suitable places on the ground.

Another object of the invention is to provide a method and means for disintegrating metal containers by means of an intermittent arc.

Another object of the invention is to provide a device of the character indicated, which may be built in as original equipment, or may be installed as an auxiliary appliance, in residences, restaurants, gas stations, hospitals, hotels, and the like.

Another object of the invention is to provide a device of the character indicated, which is compact in construction, economical to manufacture, and efficient in operation.

Another object of the invention is to provide a device of the character indicated, which is constructed and arranged, so that all of the working parts are readily accessible for adjustment, or replacement.

Another object of the invention is to provide a device of the character indicated, which will improve the sanitation and health factors of residential property, by the elimination of the discarded metal food containers, which generally accumulate as unsightly trash piles.

Another object of the invention is to provide a device which may be installed in or near a kitchen, so that the housewife may conveniently and safely dispose of the usual accumulation of metal cans, without the necessity of making numerous trips to the trash can or dump.

Another object of the invention is to provide a device which will automatically dispose of empty metal food containers in a quiet, odorless and efficient manner.

Another object of the invention is to provide a device of the character indicated, which is constructed and arranged with a rotatable cylinder so that metal containers placed therein will be consumed by intermittent arcs which are developed between the containers and a plurality of electrically conductive bars positioned in said cylinder.

Another object of the invention is to provide a device of the character indicated, which is provided with automatic controls and safety features.

Another object of the invention is to provide a device of the character indicated which is constructed with means for automatically shutting off the operation of the device, when the last metal container in the device has been disposed of.

Another object of the invention is to provide a device which is constructed and arranged, with means to limit the current in-put in the event of a short or overload, in the electrical system.

Another object of the invention is to provide a device of the character indicated, which is constructed with a power-driven revolving cylinder having a plurality of conductive bars therein, comprising part of the wall structure of said cylinder and intended for developing

2

intermittent arcs between the said bars and discarded metal containers received in the said cylinder.

Another object of the invention is to provide a device of the character indicated, which is constructed and arranged so that variable electrical amperage may be fed to the device while the device is in operation.

Another object of the invention is to provide a device of the character indicated, which is constructed and arranged, so that the operation of the device cannot be started until all of the openings in the said device have been closed.

The foregoing and other objects and advantages of the invention will become more apparent as the description proceeds, reference being made from time to time, to accompanying drawings forming part of the within disclosure, in which drawings:

FIG. 1 is a front elevational view of a device embodying the invention.

FIG. 2 is a vertical section, taken substantially on the line 2—2 of FIG. 1.

FIG. 3 is a diagrammatic view of a typical circuit employed with the device illustrated in FIGS. 1 and 2.

FIG. 4 is a right end elevational view of the structure shown in FIG. 5.

FIG. 5 is an enlarged fragmentary detail, illustrating the means for supporting the spindle, slip rings, brush holders, etc., employed in the device illustrated in FIG. 2.

FIG. 6 is an enlarged section taken through the rotatable drum, and taken substantially on the line 6—6 of FIG. 2.

FIG. 7 is a section taken substantially on the line 7—7 of FIG. 6.

Referring now more particularly to the drawings, it will be understood that in the embodiment herein disclosed, the reference character 11 indicates, in general, a metal shell in which the device is housed. The housing, 11 is preferably heat and sound insulated (not shown), so that the device may be mounted in confined quarters in a residential building and the like.

The interior of the housing 11 is divided into several compartments, by means of the internal walls and members 12, 13, 14, 15, and 16, in which compartments are mounted the working parts of the device, for example, in the compartment defined by the members 12, 15, and 16 is mounted a rotatable cylinder, which is preferably formed of a dielectric, heat-resistant material, which will be described more particularly hereinafter. In the compartment defined by the members 12, 13 and 15 is mounted a slidable drawer, or ash receiver, 18, and in the compartment defined by the bottom 11A, and the members 12, and 13 is mounted a transformer, comprising part of the electrical equipment, and in the compartment defined by the bottom 11A, and the members 12 and 14, is mounted the main control box and other electrical equipment, hereinafter described; and in the compartment defined by the rear wall 11B and the members 12, 14 and 16 are mounted an electric motor, a bearing support, a spindle, slip rings, and other elements comprising parts of the electrical system of the device, all of which will be described more particularly hereinafter. The front of the lower compartment, housing the transformer, is provided with a heavy wire screen 19 (FIGS. 1 and 2) for ventilating the transformer compartment.

The rotatable cylinder 17, is supported by means of a pair of trunnions 20, which are supported for rotation, on top of the cross-member 15. The trunnions 20, engage tracks 20A, which extend around the outer periphery of the rotatable cylinder 17. The trunnions 20, are preferably made of a non-conductive material. The cylinder 17 is rotated by means of a spindle 21, which has a squared end which is received in a squared socket

22, formed in the rear end 23, of the cylinder 17. The spindle 21, is supported by a bearing member 24, which in turn, is supported, in an opening formed in the wall 12, and by means of a bearing 25, which is supported on a bracket 26, which is secured, at either end, to the side walls of the housing 11. The bearing 24, and the bearing 25, are preferably insulated, as at 27. The spindle 21, is driven by a variable speed motor 28, through the pulleys 29 and 30 and V-belt 31. The motor 28 is electrically connected, as at 32, to the main control box 33, in which is housed the main control switch and other elements employed in the electrical circuit.

A 220-volt power line connects to the control box 33, as at 34, and the transformer 35 connects to the control box 33, as at 36. The control box 33 has leads 37, which connect to the brush holders 38, which, in turn, are in contact with the slip rings 39, which are insulated from, as at 39A, and mounted for rotation with, the spindle 21. Other leads 40 and 40A extend from the control box 33 to the starting switch, pilot light, and relays, all which are described hereinafter and illustrated in the diagrammatic view (FIG. 3).

An important feature of the invention resides in the details of construction of the rotatable cylinder 17. It will be noted that the cylinder 17 is permanently closed at the rear end as at 23, and is provided at the front end, with a snap-on cover 41, which has a handle 42, for easy manipulation. The cylinder 17 rotates inside of the compartment, which is defined by the members 12-16, the front of which compartment is closed by means of a hinged door 43, which has a hand-grip 44 and which is provided with a door interlocking member 45 (FIG. 3), which opens the electrical circuit at all times, when the door 43, is open, so that the device is rendered inoperative as long as the door 43 remains open.

Immediately below the rotatable cylinder 17 is mounted the slag and ash receiving drawer 18, which may be removed from its housing compartment by means of the handle 18A. It will be noted that the wall of the cylinder 17 is perforated, as at 46, so that the slag and ash developed within the cylinder may readily fall into the drawer 18, as the cylinder 17 is rotated.

In order to provide the rotatable cylinder 17 with the electrical energy to disintegrate tin cans and the like, which are received in the cylinder 17, I provide a plurality of carbon bars 47, which are mounted on the inside of the cylinder 17, and extend axially thereof. Each carbon bar 47 has a non-conductive counterpart 48 (FIG. 6), mounted on the cylinder 17, in parallel relation with the carbon bars 47. Each carbon bar 47, has a plurality of male elements 49 (FIG. 7) which engage recesses 50, formed in the non-conductive bars 48. Each carbon bar 47, and its counterpart 48 are tied together by means of bolts and nuts 50A (FIG. 7). Every other carbon bar 47 (FIG. 6), is connected, in series, by means of jumpers 51 and 51A. The series of carbon bars 47, connected by the jumper 51 is connected by the lead 51B to one of the slip rings 39. The series of bars 47 connected by the jumper 51A is connected by a lead 51C to the other slip ring 39. Thus, it will be seen that every other carbon bar 47 will be of opposite phase to the one next to it. This is an important feature of the invention, as it enables me to provide an intermittent arc between each pair of the carbon bars 47, and a metal container, such as a tin can, which might fall across a pair of the carbon bars.

In FIGS. 4 and 5, I illustrate the brush holders and brushes which make the electrical contact between the slip rings 39, and the leads 51B and 51C, which connect to the several series of conductor bars, carried by the rotatable cylinder 17. Each brush holder 38 is secured, as at 52, to a bracket 53, which in turn is connected to the bearing bracket 54, which is supported by the cross member 26. Each brush holder 38 has a cross head 55 secured thereto, as at 56, and each brush holder 38 has mounted, for reciprocation therein, a carbon brush 57, which is of such

width and depth as to provide maximum contact with a slip ring 39. A spring 58 is interposed between each brush 57, and the cross head 55, maintain proper pressure on the slip rings 39.

As shown in FIG. 3, the electrical circuit for the device has included therein, a main power relay 59 for controlling the power to the motor 28, and to the rotating cylinder 17, there being interposed in a secondary circuit, a time clock 60, a thermo-limit switch 61, and a door interlock 45, together with a manual starting switch 62, a pilot light 63, and a control relay 64. It will be noted that the relay 59, controlling the main power source, cannot function to provide power for the motor 28 and the cylinder 17, unless the door interlock 45, is closed. This is an important safety feature of the device. The relay 59, will not function to provide power to the motor 28, and to the rotatable cylinder 17, if any one of the members 60, 61, 45, or 62 is open, and, of course, the main on-and-off switch 65, housed in the control box 33, must also be closed to provide power to the device. The control box 33, is grounded, as at 66.

In order to withdraw from the device fumes generated during the operation of the device, I provide an induced draft fan 67, which operates at all times while the motor 28 is in operation. The fan 67 withdraws the fumes through a stack 68, which communicates with the compartment housing the rotatable cylinder 17, through the openings 69.

During the operation of the device, tin cans and the like, which are received in the rotatable cylinder 17, are tumbled about in the cylinder as it rotates, and each time a can falls across a pair of conductive bars 47, arcs are generated between the can and the bars, of sufficient intensity to disintegrate the metal comprising the cans. As the metal is disintegrated, it forms a powdery slag, which falls into the ash container 18, which can be removed for cleaning at will.

On the control box 33, I have indicated a multiplicity of positions 70, between the on-and-off positions of the switch, whereby varying degrees of amperage may be fed into the device.

It is believed that the operation of the device is obvious from the foregoing description.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. A device for disintegrating metal containers, comprising a housing, having a feed opening therein, closely spaced means in said housing for electrically disintegrating said containers, when said containers contact pairs of said spaced means, electric circuits connected to said means, and means for collecting and removing the remains of said disintegrated containers.

2. The structure of claim 1, in which said first named means include a rotatable cylinder having a plurality of electric arc forming elements therein.

3. A device for disintegrating metal containers, comprising a housing, having a feed opening therein, closely spaced means in said housing for electrically disintegrating said containers, and means for collecting and removing the remains of said disintegrated containers, said first named means including a power-driven rotatable cylinder, the inside periphery of which comprises a plurality of carbon bars arranged in spaced parallel relation in said cylinder and electrical power connections for said bars.

4. A device for disintegrating metal containers, comprising a housing, having a feed opening therein, closely spaced means in said housing for electrically disintegrating said containers, and means for collecting and removing the remains of said disintegrated containers, said first named means including a power-driven rotatable cylinder, the inside periphery of which comprises a plurality of carbon bars arranged in spaced parallel relation in said cylinder and electrical power connections for said bars, the said bars being arranged in pairs, the bars of each pair being connected in series.

5

5. A device for disintegrating metal containers, comprising a housing, having a feed opening therein, closely spaced means in said housing for electrically disintegrating said containers, and means for collecting and removing the remains of said disintegrated containers, said first named means including a power-driven rotatable cylinder, the inside periphery of which comprises a plurality of carbon bars arranged in spaced parallel relation in said cylinder and electrical power connections for said bars, the said bars being arranged in pairs, the bars of each pair being connected in series, and arranged so that each bar is out of phase with each adjacent bar.

6. A device for disintegrating metal containers, comprising a housing, having a feed opening therein, closely spaced means in said housing for electrically disintegrating said containers, and means for collecting and removing the remains of said disintegrated containers, said first named means including a rotatable cylinder of dielectric material, there being a plurality of conductive bars in said cylinder arranged in axial alignment, every other bar being electrically connected in series, power connections to said bars, a cover for closing the end of said cylinder and means interposed between said cover and said power connections for disconnecting said power when said cover is open.

7. A device for disintegrating metal containers, comprising a housing, having a feed opening therein, closely spaced means in said housing for electrically disintegrating said containers, and means for collecting and removing the remains of said disintegrated containers, said first named means including a rotatable cylinder having intermittent arc forming elements on the inside periphery thereof, means to support said cylinder during rotation, power means to rotate said cylinder, and power means to energize said arc forming elements.

8. A device for disintegrating metal containers, comprising a housing, having a feed opening therein, closely spaced means in said housing for electrically disintegrating said containers, and means for collecting and removing the remains of said disintegrated containers, said first named means including a rotatable cylinder having intermittent arc forming elements on the inside periphery thereof, means to support said cylinder during rotation, power means to rotate said cylinder, and power means to energize said arc-forming elements, and means to disconnect said power means, including at least one control

6

switch actuated by the opening and closing of the feed opening into said housing.

9. A device for disintegrating metal containers, comprising a housing, having a feed opening therein, closely spaced means in said housing for electrically disintegrating said containers, and means for collecting and removing the remains of said disintegrated containers, said first named means including a rotatable cylinder having a plurality of conductive bars positioned axially on the inside periphery thereof, every other bar being connected in series to a slip ring, each slip ring being in contact with a brush holder, which brush holders are electrically connected to a variable output, low voltage, high amperage transformer.

10. A device for disintegrating metal containers, comprising a housing, having a feed opening therein, closely spaced means in said housing for electrically disintegrating said containers, and means for collecting and removing the remains of said disintegrated containers, said first named means including a rotatable cylinder having a plurality of conductive bars positioned axially on the inside periphery thereof, every other bar being connected in series to a slip ring, each slip ring being in contact with a brush holder, which brush holders are electrically connected to a variable output, low voltage, high amperage transformer, there being a relay positioned in the electrical circuit connected to said transformer for controlling the output of said transformer to said bars.

11. The method of disintegrating a metal container which consists of placing the container in a dielectric receptacle, having conductive elements therein, feeding electricity to said elements, tumbling said container in said receptacle so that said container repeatedly may fall across a pair of said conductive elements, whereby intermittent arcs are developed between said container and said conductive elements, and continuing the process until said container is completely disintegrated by said arcs.

References Cited in the file of this patent

UNITED STATES PATENTS

1,070,337	Greene	Aug. 12, 1913
2,039,853	Stenhouse	May 5, 1936
2,490,302	Holfelder	Dec. 6, 1949
2,693,774	Knowles	Nov. 9, 1954
2,823,626	Raucher	Feb. 18, 1958
2,850,618	Rudorff	Sept. 2, 1958