



Beverage Cans Crusher Machine Patents: A Review: Part VI

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Abstract

One of the first step for inventors to avoid repetition of existed inventions is to study all previous inventions in the area. In view of that, we summarized here all early inventions for CAN crusher machines within years 1988 to 1991, while other periods will be presented in separate work. The study covered about 38 patents. A summary of each patent is presented in a very brief way. However, details about each patent could be presented in a separate study.

Keywords: Review; patents; CAN crusher machines; period 1988-1991

A Brief Summary of Can Crushers Patents

A brief summary of patents for CAN crusher machines is highlighted here; It is important to clear that in our early review studies, see e.g. [1-8], we presented more about the CAN crusher machine patents.

Apparatus Having Pivotal Arm for Crushing Cans, Patent Number: 5069121

The CAN smashing gadget revealed thus contains two sections. One section utilizes a moderately limited bar to twist deep down the center of the can, ideally one made of aluminum. This progression additionally tilts the finishes of the CAN deep down, along these lines making it more powerless to be all the more effortlessly smashed into one minimized, moderately level piece. This second step is affected by a second part which involves a construct parcel in light of which the incompletely twisted CAN is situated and an upper versatile bit which is crucially associated with the base segment [9].

Aerosol Can Recycling Apparatus and Methods, Patent Number: 5067529

A multi-stage, group or ceaseless, manual or computerized process and contraption for securely depressurizing, de-topping (decrimping in addition to pulling tops), and reusing airborne

jars, charges, solvents, synthetic compounds, plunge tubes, and CAN tops. The mechanical assembly incorporates a synchronized arranging and stacking unit for managing the jars onto a propelling line. The jars are first depressurized by a vacuum head until the point when including a vacuum seal and a reciprocable empty needle which punctures the CAN recessed best top and evacuates the forces by suction for later reuse or transfer. The jars are progressed to a decapping until where the top part is expelled by decrimping to split the close taken after by being vertically pulled without harm to the can's moved lip [10].

Can Crusher, Patent Number: 5067398

A CAN crusher involving a compartment, a reversible engine mounted in that, a pinion equip driven by said engine and an apparatus driven by said engine and a rigging of more noteworthy breadth driven by said pinion adapt. A strung shaft, having right hand strings on one side and left-hand strings on the contrary side, is given as the rigging of more prominent distance across. A couple of can-squashing arms, one equipped to the correct hand strings and the other outfitted to one side hand strings, impacts smashing of a CAN therebetween. A turning around switch is worked by one of the can-squashing arms after foreordained development the devastating way to divide the arms [11].

Means to Extract Oil from Used Automotive Oil Filter, Patent Number: 5060564

A press, in a car benefit office to separate oil from a utilized car oil channel, mounted by sections on a waste transfer band over an opening in the highest point of the barrel. An entrance way to the press having a cam following up on a press control handle to counteract activity of the press when the entryway is open. A pressure driven barrel in the press and a plate under the chamber and oil channels being stored on the plate and being squeezed to remove oil by the water powered chamber lifting the plate against the base of the chamber. The press being controlled by low weight air in the administration office which is changed over to high weight water driven weight by a numerous stroke pumping framework that incorporates a bigger breadth air cylinder, in an air chamber, connected to a littler distance across pressure driven cylinder [12].

Structure of Aluminum CAN Crusher, Patent number: 5058498

An aluminum CAN crusher of the sort having a driving rigging mounted on a mobile hub, which is transversely arranged inside a lodging, and drew in with an apparatus rack on the back of the vertical surface part of a significantly L-formed squashing plate. A significantly U-molded handle is coupled to the mobile pivot to convey it to turn. Bringing down the handle makes the driving apparatus move the devastating plate descending against the base of the lodging for squashing a mediated aluminum CAN [13].

Can Crushing Apparatus, Patent Number: 5048413

A stage is upheld on uprights on a base and stretches out finished the highest point of an open best waste container organized to be bolstered on the base. A CAN squashing compartment is upheld on the stage and has a controlled plunger masterminded to smash jars in the compartment to a lessened size. The compartment in which the jars are pounded has a base opening which is of confined size whereby to keep up jars in the compartment before pressing yet which enables jars to fall by gravity into the waste repository subsequent to being smashed. Fixing structure is given between the stage and the waste container and furthermore between a cover on the devastating compartment. Venting channels and outlets are given on the stage that concede natural air and that divert exhaust from the waste repository [14].

Collection and Recycling Unit for Used Containers, Patent Number: 5042634

A framework for gathering and reusing utilized holders produced using metal and plastic materials, having two distinctive agent cycles for handling the compartments in a shut work area compartment gave two openings for presenting holders while pre-isolating the plastic from the metal holders; bring down entryways give access to the desk area to expulsion of prepared holders, a door including a focal opening for getting the neck and just permitting

section of the plastic holder detected by a neck sensor and for working an electrically worked cylinder barrel get together to work the entryway and allow the whole plastic jug to be passed on to a first roller set for crushing thereof including moderate rollers situated between two pressing rollers, the halfway rollers having diverse breadths for decreasing the measure of the compartment, and the metal holder is likewise passed on to a second arrangement of crushing rollers and the two sorts of compartments pass a sensor for tallying the number thereof [15].

Can Crusher with Crimping Member, Patent Number: 5038677

A CAN crusher for compacting jars, for example, aluminum soda jars, into a considerably level arrangement for capacity, reusing or transfer. The CAN crusher incorporates a base with restricting spines and a handle which pivots about the ribs. The handle incorporates a broadening pleating part which packs the focal point of the CAN downwardly, and furthermore powers the closures of the CAN internally. The handle likewise incorporates a level surface which at that point straightens and pivots the closures of the CAN towards a mid-segment of the CAN into a generously level arrangement. The main activity of the expanding pleating part against the CAN and the second activity of the level surface against the CAN smash the CAN into a considerably level CAN, which is earth and naturally valuable in reusing forms. The smashed CAN devours less space in reusing tasks or transfer, and earth and naturally introduces itself in an additionally satisfying way to recycle or transfer [16].

CAN Crusher, Patent Number: 5033375

An enhanced CAN crusher gadget including a loop spring, shaping a chamber, joined at its upper end to a considerably level plate. At the point when compel is connected to the circle a CAN set inside the chamber is squashed. Preferably, the loop spring is flared logically toward its lower end to present solidness to the gadget amid the CAN squashing task and advance ideal CAN pressure. The favored plate has a fringe edge and annular divider on its lower surface which work with the loop spring to hold the CAN set up. One favored exemplification has holes in the annular divider to discharge gathered pneumatic force. At the point when not being used, the CAN crusher might be compacted for capacity or transportation with holders situated through the plate and under the loop. The gadget is light weight, yet sturdy, advances speedy, proficient CAN pressing, and improves the monetary ethics related with reusing void jars [17].

Apparatus and Crushing Disposable Containers, Patent Number: 5025995

A reduced mechanical assembly to process dispensable compartments at their gathering site utilizes a solitary combine of counter-turning squashing rollers mounted one over the other. The compartments are dropped against the upper surface of an indented sustaining roller parallel and adjoining the lower pressing

roller. The jars are gotten by the fringe spaces of the encouraging rollers and on a level, plane kicked between the consolidating surfaces of the devastating rollers. An indented take-up roller on the contrary side of the most minimal smashing roller gets the pounded compartments and drives them at a slant upwards into a gathering canister [18].

Can Disposal Apparatus, Patent Number: 5010810

A device including a transfer conductor mounted in basic relationship to a plate. The plate incorporates a passageway opening in arrangement with the course, and wherein the channel incorporates a lowermost terminal end and an arcuate chute mounted to the lower terminal end of the conductor and coordinated downwardly and forwardly of the course and situated to store a related CAN forwardly of a reciprocable slam. The smash is coaxially lined up with a help chute, wherein the help chute incorporates a forward terminal end divided from a side mass of an encompassing lodging a separation short of what one-a large portion of a foreordained length of the related can. A CAN saved inside the help chute incites a change to stimulate the smash and in like manner pounds the CAN to along these lines store the CAN in fundamental stockpiling compartment of the lodging [19].

Can Crusher for Household Use, Patent Number: 5009155

A gadget, appropriate for family use, to crush normal aluminum drink jars between a versatile and a stationary pressure plate. The versatile pressure plate moves by and large parallel to a can's pivot, at first captivating the CAN at an edge thereof to apply pressing power along one side of the CAN and having a tendency to conquer the can's basic honesty. The mobile plate turns somewhat as it travels through a pressure stroke. Toward the finish of the stroke the two pressure plates are parallel to each other and dispersed separated adequately to influence the pounded to CAN as smaller as could be expected under the circumstances and to limit the likelihood of damage which may result from, for instance, shutting the plates on human fingers when a CAN isn't set up. The working parts of the gadget are mounted to a back plate which is adequately long to give use to enable the gadget to be worked without being mounted to a surface, for example, a divider [20].

CAN Flattening Machine, Patent Number: 4995314

The CAN smoothing machine of the present innovation includes a first transport for conveying the jars to the upper end of a container situated over a couple of belt gatherings. The belt congregations are lengthened and are situated with respect to each other in order to make a V-formed score therebetween. The jars fall between the belt gatherings and are smoothed between the lower closures of the belt congregations. One of the lower closures of the belt gatherings is spring mounted regarding the other in order to be yieldable portable far from the other belt get together [21].

Collector for Empty Used Recyclable Beverage Cans, Patent Number: 4989507

A huge round and hollow fenced in area molded to resemble an immense refreshment CAN has a recessed territory in its external divider containing an administrator's board and an opening into the inside for embedding's void recyclable drink jars. Inside the walled in area is a transport for getting the embedded jars, implies for recognizing ferrous and non-ferrous recyclable jars, implies for tallying the quantity of ferrous and non-ferrous jars and pneumatic transporting implies for conveying the jars to a mechanical crusher which compacts the jars separately and releases them into a brief stockpiling zone from which they are expelled every once in a while for reusing. The administrator's board incorporates physically operable catches for starting activity of the components in the inside of the structures and may incorporate different visual readouts and also a container for encouraging out coins, printed credit slips and receipts [22].

Compaction of Aluminum Beverage Cans, Patent Number: 4976196

A straightforward family compose CAN crusher to be utilized on aluminum drink jars causes a devastating activity in which the finishes of the CAN are pivoted so they lie level on an upper surface of the smashed CAN with the fringe mass of the CAN staying in civility on one side of the pressed CAN for examination of the written word so the inception of the CAN be resolved. The CAN crusher incorporates a couple of handles which, when pivoted to the vertical position carries two bars into contact with the upper surface of the CAN while it lies flat along these lines wrinkling the CAN and causing the closures of the CAN to turn towards the wrinkled segment. At the point when the handles are pivoted to the level position this carries two oars into contact with the somewhat turned finishes of the CAN and, with negligible weight on the handles, the CAN is compacted into a promptly salvageable state of four creeps by six inches. The handles are then turned to the first clear position which permits simple expulsion of the compacted CAN [23].

Can Crushing Apparatus, Patent Number: 4970951

An electrically activated CAN squashing mechanical assembly having a lodging, a reversible engine mounted inside the lodging, a strung shaft coupled for turn with the yield shaft of the engine, and an arm threadingly connected with to the strung shaft. An anti-rotation gadget precludes the arm from turn in this way allowing the arm to move upwardly and downwardly, subordinate upon the heading of revolution of the strung shaft. A highest weight plate is anchored to the arm at an edge skewed to the longitudinal hub of the vertically arranged strung shaft. The lodging underpins a lowermost weight plate which is appended in an even plane and is adjusted with an upwardly guided bulge to suit the discouragement generally found in the base of jars to be pressed. Upon the activation

of the engine, the highest weight plate, which is always kept up at a slight rakish association with the longitudinal hub of the strung shaft, approaches the lowermost weight plate [24].

Bypass Mechanism for Magnetic Separator, Patent Number: 4967912

A strategy using a basic instrument to bypass the impact of the attractive transport leader of an attractive separator, whereby ferrous material, for example, steel jars CAN be occupied from the stationary reject chute to go rather to where nonferrous materials go. The component, called a versatile chute, is really a mobile augmentation of the stationary reject chute and rotates up or down on a pivot gadget that associates it to the stationary reject chute. It tends to be anchored in the up position by a locking gadget. It tends to be kept up at a consistent point in the down position by a ceasing gadget. Edges to the portable chute are given to keep material from tumbling off the sides. These edges are mounted either on the portable chute or on the sides of the attractive separator. In the last case they are called stationary aides. At the point when the versatile chute is in the up position it frames a straight augmentation to the stationary reject chute [25].

Beverage Can Crusher, Patent Number: 4962701

A crusher is accommodated pounding run of the mill refreshment jars to abbreviate their tallness for encouraging transfer and reusing. An upright divider mounted magazine conveys a section of jars arranged with their lengths on a level plane and the jars move gravitationally, one by one, into a devastating chamber in which a physically worked plunger capacities to pound each CAN pivotally to an abbreviated length empowering it to drop from the devastating chamber into a holding up repository [26].

Automatic Reverse Vending Machine for Aluminum Can Recycling, Patent Number: 4953682

A device smashes aluminum jars at a quick rate and administers pay for the squashed jars. The device pounds the jars on the longitudinal pivot instead of longwise which results in a more conservative unit therefore sparing storage room. The device likewise forms the jars speedier than most existing machines. The device contains a fenced in area with an opening for getting jars prompting a chute for the jars to fall each one in turn with the round and hollow pivot significantly vertical. A container discharges one CAN at once from the chute past an indicator to dismiss any jars that are not aluminum, through an entryway which closes and allows a platen to squash the CAN on the shut door. The pressed CAN is shot out into a release compartment and remuneration proportionate with the quantity of jars prepared is issued [27].

Device for Compressing Empty Cans, Patent Number: 4942812

Exhibited is a CAN pressing gadget which might be physically worked by utilizing a foot-worked cylinder to force a compressive

power on the finish of a CAN contained inside a tube-shaped cavity. A handle is given on the gadget to balance out the gadget and give a help by which the administrator may adjust himself amid utilize [28].

Apparatus for Recycling Oil Filters, Patent Number: 4927085

A specific crusher has an upright compartment estimated to get an individual oil channel laying on a mesh at the base. A crusher plate over the channel is guided for vertical sliding development in the compartment and is climbed and around a pressure driven jack. Descending development of the crusher plate crumples the oil channel packaging to smaller condition and oil contained in it goes through the base mesh into a gush prompting a repository. At the point when a coveted weight has been achieved, the jack consequently lifts the crusher plate and the fallen packaging CAN be expelled for rescuing. All segments of the mechanical assembly are consolidated in a conservative bureau which CAN have a base cabinet for the oil repository and a container in which the fallen housings CAN be gathered [29].

Apparatus and Method for Handling Returnable Beverage Container, Patent Number: 4919274

A mechanical assembly to separate returnable drink compartments from non-returnable refreshment holders incorporates a V-molded repository for getting the compartment, an entrance entryway and a leave entryway. A downwardly slanting incline manages the compartment from the repository to a couple of rollers for turning the holder. First and second boards broaden horizontally apparently and upwardly of the rollers for ceaselessly directing the holder back onto the rollers amid revolution. A sweeper arm moves in a way over the rollers to discharge the holder rearwardly toward a couple of avoidance entryways for guiding the compartment to either an acknowledge station where the compartment is pressed or a reject station where the holder is come back to the administrator [30].

Crusher for Battery Cathodes, Patent Number: 4917313

A crusher for battery anodes having a divider, a majority of crusher heads inverse the divider, a belt conveyed by the crusher sets out toward moving battery cathodes through the crusher, and an opening characterized between the primary floor and the second floor through dividers released from pressed battery cathodes [31].

Pressing Device, Patent Number: 4909141

A gadget for squeezing barrel shaped compartments holding atomic office squander materials into plate pellets incorporates an underlying press and a fundamental press. In the underlying press, the compartment is disfigured by a game plan of versatile bites the dust and pressure easing rams into a shape appropriate to fit into a compaction chamber in the fundamental press. After

the compartment is crumpled by the bites the dust and slams of the underlying press, the underlying press is opened and the fell holder is kept into the compaction council of the fundamental press where it is compacted into a plate like pellets and released from the compaction chamber [32].

Can Crusher, Patent Number: 4890552

A CAN crusher includes a base plate and a handle that pivot about a first hub. A best plate is slidable along the handle. A connection significantly interfaces the best plate to a second pivot balance from the main hub. Turning the handle and base plate has a tendency to rotate the best plate far from the second hub, however the connection keeps the best plate at a settled separation from the second hub by controlling the best plate to slide along the handle toward the base plate. A CAN or other question set between the best and base plates is squashed between them as the handle turns. The handle regularly pivots from a vertical disposition toward a level demeanor amid the devastating activity. The handle and base plate CAN pivot to a steady rest arrangement underneath the main hub [33].

Metal Container Crushing Device, Patent Number: 4884502

A metal holder pounding gadget containing a base part and an arm which are each pivotable appended to each other toward one side. The arm steadily underpins a smaller part adjoining the turned end of the arm and an imprint part. The conservative part incorporates a lip which, alongside the minimal surface, attentively draws in with one end of the holder. The metal holder squashing gadget is lightweight and physically worked so metal compartments and such CAN be advantageously pounded in a three-stage activity [34].

Apparatus for Crushing Cans, Patent Number: 4862796

A mechanical assembly is for squashing no less than one of a majority of metal jars having a foreordained distance across and a foreordained length not exactly about double the foreordained width. The contraption incorporates a couple of barrel shaped rollers mounted for pivot in inverse ways about parallel level tomahawks with a foreordained separation therebetween. Every one of the rollers has a foreordained roller distance across more noteworthy than four times the foreordained breadth of the can. A variety of expansions on the round and hollow surface of every one of the rollers expands a foreordained range from the barrel shaped surface and is isolated from neighboring augmentations on the tube shaped surface to make the augmentations of the exhibit cover under 10% of the tube shaped surface to permit general arrangement of and situating of the metal jars therebetween [35].

Process and Device for Opening by The Median Zone of Their Bodies, Emptying And Flattening Hermetically Closed Metal Or Composite Containers, Patent Number: 4859132

Mounted in an edge are:

- a. a container having at its base an opening and spaces delimiting alternatively explained, slanted and vertical dividers which open into the opening
- b. a slanted transport or chute for providing the container with compartments through a bolt; and
- c. an apparatus controlling one or a majority of blades for cutting the holder, which instrument is mounted in the casing in order to be dislodged against the compartments and is given a manual actuator, the blade having a form adjusted to the state of the compartments and being situated in order to mostly and transversely separate the compartments in the average locale of their bodies;
- d. the device including a slam for opening and leveling the holders against the slanted dividers of the container, after the holders have been cut by the blade, while making the compartments be discharged into a repository set under the container [36].

CAN Crusher, Patent Number: 4827840

A CAN crusher consisting of a vertical hopper for receiving empty CANS laid horizontally in a vertical stack one above the other, with the bottom CAN positioned in the stack at the end-to-end registration with a plunger head which reciprocates horizontally between the withdrawn position out of contact with the bottom CAN and the extended position for crushing and compressing the bottom can. When the plunger is removed, the crushed CAN falls through a discharge opening that is just large enough to allow the compressed CAN pass through but small enough to prevent the uncrusted CAN from slipping through. The crushed CAN falls into the container below the discharge opening, and the next CAN drops into the vertical stack [37].

Aluminum Can Crusher, Patent Number: 4821969

In a CAN crusher, jars lying in a semi barrel shaped compaction chamber are pressed between a mobile slam and a stationary iron block plate. The slam is driven by a smash bar reaching out from the smash, a slam pole wrench arm turned to the slam bar and pivoted by a power-driven crankshaft. Squashed jars are shot out from between the smash and iron block plate subsequent to being pounded, and uncrushed jars are encouraged to the long way position in the compaction chamber each time the slam moves once more from the blacksmith's iron plate. The uncrushed jars are

bolstered, end to end, into the compaction chamber from a feed tube situated over the chamber. The feed tube has a stick getting to open gave in it, and a stick holding sleeve reaches out from the feed tube in encompassing relationship to the opening. The stick wrench arm is steadily mounted on the crankshaft in settled precise association as for the smash pole wrench arm [38].

Compression Apparatus for Solid Waste, Patent Number: 4817521

A pressure mechanical assembly to reduce strong waste in volume, including: a base; a hub pressure component for pivotally compacting a columnar holder containing the strong waste, the hub pressure system including a punching instrument having first teeth anticipating radially outwards from an external fringe thereof at parallel rakish interims around a hub thereof, a base shape component mounted on the base, and a drive system for driving the punching system toward the base form component for hub pressure; and a shape adjusted to be put on the base shape instrument to be concentric with the punching system and having a cavity divider for coaxially getting the compartment, the pit divider including a majority of shape projections anticipating radially inwards consequently and expanding pivotally at measure up to precise interims about the hub, each form projection including a slanted internal face slanted to the hub and in contact with a funnel shaped plane decreasing toward both the hub and the base mole [39].

Compression Apparatus Having Precompression Device and Main Compression Device, Patent Number: 4809600

A pressure device for strong waste incorporates a precompression gadget and principle pressure gadget. A precompression gadget incorporates a precompression sleeve for accepting in that a barrel shaped vessel loaded up with the strong waste and a press slam orchestrated above said precompression sleeve and mobile upward and descending for packing, at high weight, the round and hollow vessel in the precompression sleeve. The pressure sleeve incorporates an upper straight huge measurement partition, and a middle of the road decreased bit, along these lines compacting the round and hollow vessel and diminishing its volume in three dimensional ways by packing the vessel radially deep down at the decreased internal surface of the moderate decreased segment. The primary pressure gadget incorporates a principle pressure squeeze smash and a fundamental pressure sleeve having an inward measurement close to the internal width of a lowermost end of the middle-decreased bit [40].

Compacting Apparatus with Precompaction Tamper, Patent Number: 4787308

A mechanical assembly to compact articles including a compaction chamber adjusted to get articles to be compacted. An article chute is situated to encourage articles into the compaction

chamber. An alter is mounted in the article chute for precompacting articles in the compaction chamber. A compaction platen is mounted for forward and backward development in the compaction chamber. In one exemplification, the power connected by the platen to the articles in the compaction chamber is estimated when the platen is at a chosen purpose of development in the compaction chamber. In the event that the power estimated is not as much as a chose sum, extra articles are added to the compaction chamber. In the event that, then again, the power is at any rate equivalent to a chose sum, the articles are shot out from the compaction chamber. Another epitome, the alter is versatile between an open and a shut position [41].

Method and Apparatus for Selective Scrap Metal Collection, Patent Number: 4787495

A piece metal accumulation framework having device for isolating ferrous from non-ferrous material for which the weight surpasses a pre-decided sum and isolating metallic materials from non-metallic materials. The subsequent material staying after these partitions is run of the mill aluminum jars. The jars are compacted by a devastating mechanical assembly weighed and circulated in a capacity zone. Coins are come back to the administrator of the mechanical assembly dictated by the weight and adjusted to the closest penny for the aggregate weight. Device is unveiled for deciding the too much substantial material by enabling the unnecessarily overwhelming material to fall and effect a plate. The detachment of ferrous material has been actualized in a way to abstain from sticking of the transport line. The dispersion is of the compacted material in the capacity compartment. Different enhancements in the mechanical assembly and in the control of the contraption with respect to earlier piece metal gathering frameworks are portrayed [42].

Can Compacting Apparatus with Selectable Exit Ports and Method Therefore, Patent Number: 4771685

An enhanced electrically controlled CAN compacting mechanical assembly including a cylinder compose plunger to longitudinally squash jars and after that store them either in a holder there below or onto the surface whereupon the compactor is bolstered. The enhanced compacting device fuses a programmed feed security container and is controlled by a non-switching electric engine which drives a progression of low-contact decrease equip congregations. The last decrease outfit get together, thusly, equally drives the compacting cylinder [43].

Apparatus for Crushing Small Waste Containers, Patent Number: 4771686

Mechanical assembly to crush squander holders, for example, jars, oil channels, and so forth. The mechanical assembly incorporates a stage having a deplete prompting a store beneath the stage; a vertical help outline anchored to the stage and having

two divided separated vertical sections combined, close to the best thereof, by a level part; a pressure driven slam mounted on said even part, a smash go to the lower end of the water powered slam adjusted for descending and upward development; and a compartment for getting waste holders. The base of the compartment is anchored to the stage and the sidewalls thereof are anchored to the vertical help outline. The compartment has an opening for presenting a waste holder onto the stage and expelling the compartment in the wake of pounding and a penetrating gadget for puncturing compartments put in the compartment. A water driven draw mounted on the stage and associated with the pressure driven slam causes upward and descending development of the smash head [44].

Can Crusher, Patent Number: 4735367

Mechanical assembly to crush jars or the like includes a transport framed from a majority of unlimited chains coordinating with a settled slanted pressing plate uniting toward the release end of the transport. The devastating plate incorporates an actuator strip-like part pivoted to the plate which when discouraged draws in an electrical change to work a drive component for the transport. A CAN stored into the mechanical assembly discourages the actuator which works the electrical change to begin the drive component. The CAN is grasped by the chain transport and pulled descending between the transports and squashing plate straightening the can. At the point when the smoothed CAN exits the devastating mechanical assembly the actuator is discharged ceasing the drive component. A help lodging for the mechanical assembly is given an opening for accepting jars which is dispersed a separation from the devastating plate and transport to decrease the danger of damage [45].

Portable Can Crusher, Patent Number: 4722269

A versatile CAN crusher for reprocessing jars, for example, lager jars and so forth. The crusher incorporates a container in which a confound is accommodated coordinating jars towards a lengthen opening framed between a packaging base and a determined reprocessing wheel. The wheel has distortion implies on its outskirts not exclusively to pack jars bolstered to the gap yet in addition to aid the encouraging of jars through the gap. The CAN crusher might be trailer or vehicle mounted [46].

Summary and Conclusion

The study provides a review outline for patents of crusher/press machines. Such review work is implausibly useful for any designer/inventor to urge an in-depth data of the early patents for such machines. The review here lined the patents between the restricted yours from 1988 to 1991. The study given an overview for concerning thirty-eight patents, however, careful descriptions for each patent progressing is to given at a separate study. This study offers a title of each patent, patent issued date, name of the creator and patent's summer.

References

1. Elfasakhany A, Marquez J, Rezola EY, Benitez J (2012) Design and Development of an Economic Autonomous Beverage Cans Crusher Int. J of Mech Eng Tech 3(3): 107-122.
2. Elfasakhany A (2018) A new Patent of Beverage Cans Crusher Machine. Current Alternative Energy 2: 1-9.
3. Elfasakhany A (2018) Beverage Can Crusher Machine Patents: A Review: Part I. Asian Review of Mechanical Engineering, 7(2): 62-69.
4. Elfasakhany A (2018) Beverage Can Crusher Machine Patents: A Review Part II. Asian Review of Mechanical Engineering 7(2): 76-82.
5. Elfasakhany A (2019) Beverage Can Crusher Machine Patents: A Review Part III. Asian Review of Mechanical Engineering 8(1): 1-7.
6. Elfasakhany A (2019) Beverage Can Crusher Machine Patents: A Review Part IV. Asian Review of Mechanical Engineering 8(1): 11-17.
7. Elfasakhany A (2019) Beverage Can Crusher Machine Patents: A Review Part V. Asian Review of Mechanical Engineering 8(1):31-38.
8. Elfasakhany A (2016) Beverage cans crusher machine, Patent number: 4610.
9. Fletcher JS (1991) Apparatus having pivotable arm for crushing cans, Patent number: 5069121.
10. Gonzalez Miller WE, Dulin JM (1991) Aerosol can recycling apparatus and methods, Patent number: 5067529.
11. Thoma NE (1991) Can crusher, Patent number: 5067398.
12. Buford CG, Dawson TJ (1991) Means to extract oil from used automotive oil filter, Patent number: 5060564.
13. Chen J (1991) Structure of aluminum can crusher, Patent number: 5058498.
14. Deiters FJ (1991) Can crushing apparatus, Patent number: 5048413.
15. Gulmini C (1991) Collection and recycling unit for used containers, Patent number: 5042634.
16. Wittman B, Gregerson BL (1991) Can crusher with crimping member, Patent number: 5038677.
17. RE Reeves (1991) Can crusher, Patent number: 5033375.
18. Smith LF (1991) Apparatus and crushing disposable containers, Patent number: 5025995.
19. DeLorme DJ (1991) Can disposal apparatus, Patent number: 5010810.
20. KA Christianson (1991) Can crusher for household use, Patent number: 5009155.
21. Buer JJ (1991) Can flattening machine, Patent number: 4995314.
22. Rhoades WM, Bailey LD (1991) Collector for empty used recyclable beverage cans, Patent number: 4989507.
23. Phillips WC, Germann A, Olm OJ (1990) Compaction of aluminum beverage cans, Patent number: 4976196.
24. Katz PR (1990) Can crushing apparatus, Patent number: 4970951.
25. Schonberg DJ (1990) Bypass mechanism for magnetic separator, Patent number: 4967912.
26. Stralow CJ (1990) Beverage can crusher, Patent number: 4962701.
27. Helbawi S (1990) Automatic reverse vending machine for aluminum can recycling, Patent number: 4953682.
28. Williams JR (1990) Device for compressing empty cans, Patent number: 4942812.
29. Oberg GD (1990) Apparatus for recycling oil filters, Patent number: 4927085.

30. Hammond NJ (1990) Apparatus and method for handling returnable beverage container, Patent number: 4919274.
31. Morris DW (1990) Crusher for battery cathodes, Patent number: 4917313.
32. Blenski HJ, Janberg K, Rittscher D (1990) Pressing device, Patent number: 4909141.
33. Yelczyn L (1990) Can crusher, Patent number: 4890552.
34. Stacey WS (1989) Metal container crushing device, Patent number: 4884502.
35. Lodovico FJ, Wagner JW, Cerra RD (1989) Apparatus for crushing cans, Patent number: 4862796.
36. Chasseray Y (1989) Process and device for opening by the median zone of their bodies, emptying and flattening hermetically closed metal or composite containers, Patent number: 4859132.
37. Kane RJ (1989) Can crusher, Patent number: 4827840.
38. Fox VJ, Fox DG (1989) Aluminum can crusher, Patent number: 4821969.
39. Katada K, Sakata Y (1989) Compression apparatus for solid waste, Patent number: 4817521.
40. Yamamoto K, Torita K (1989) Compression apparatus having precompression device and main compression device, Patent number: 4809600.
41. Newsom HR, Lockman MW, Boren KB (1988) Compacting apparatus with precompaction tamper, Patent number: 4787308.
42. Tuten WJ, Crosby KD (1988) Method and apparatus for selective scrap metal collection, Patent number: 4787495.
43. Wagner CM (1988) Can compacting apparatus with selectable exit ports and method therefor, Patent number: 4771685.
44. Triantos JF (1988) Apparatus for crushing small waste containers, Patent number: 4771686.
45. Brutosky AJ (1988) Can crusher, Patent number: 4735367.
46. Watkinson JW (1988) Portable can crusher, Patent number: 4722269.

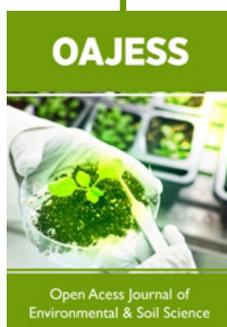


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