

## Beverage Cans Crusher Machine Patents: A Review (Part V)

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**Abstract** - One of the requirements for any inventor for can crusher machines is to study all previous inventions in the area all over the world. In view of that, the study aims at presenting brief summary of the previous inventions for can crusher machines. We presented here the inventions within years from 1992 to 1993, i.e. couple of years since there are many inventions for such machines around the world; however, other duration periods were already covered in the early papers.

**Keywords:** Can Crusher, Patents, Review Machines, Period 1992–1993

### I. A BRIEF SUMMARY OF CAN CRUSHERS PATENTS

This study summarizes the early patents for can crusher machines, as shown below. The study here is dedicated for review study within the period from 1992 to 1993; however, in our early studies [1-7], we covered different time.

#### 1. Apparatus and Method for Removing Contents from Compressed Gas Cylinder, Patent Number: 5269352

The present creation involves a mechanical assembly and strategy for evacuating and generally dealing with the substance of packed gas barrels and different unsafe holders. The creation incorporates a specifically sealable chamber that gets a compartment to be adjusted. A shearing gadget, for example, a saw or shaper is given inside the chamber. Once the chamber is fixed, the shearing gadget draws in the barrel and shears off a part thereof. Such a task allows the whole substance of the barrel to be discharged into the chamber. A favored epitome of the present creation incorporates a gadget for controlling the situation of the chamber to encourage gravitational seepage of the substance. The present creation additionally incorporates a purification framework that conveys sterilization or purging liquids to both the inside of the opened barrel and the chamber. The present innovation additionally incorporates a departure framework that expels all gases from the chamber and the barrel in an earth safe way [8].

#### 2. Plastic Bottle and Can Crusher, Patent Number: 5265530

A gadget for compacting empty aluminum or plastic compartments including a base having a curved bend formed surface having a first span, an arm having an arched circular segment molded surface having a second sweep, significantly equivalent to or littler than the principal range,

and a pivot for hingedly anchoring a first end of the arm contiguous a first end of the base whereby the arm is urgently portable on the pivot in respect to the base between a shut position in which the raised surface is gotten and settled in the span of the inward surface break and the sunken and curved surfaces are considerably parallel along their particular curves [9].

#### 3. Environmental Crusher Cooler, Patent Number: 5263338

The creation is essentially a cooler that has been intended to wipe out the issues of what to do with the lager, pop or other drink jars after they are vacant. In the favored exemplification of the creation a person who has drank his drink can from the cooler segment of the innovation just places his can in the crusher segment of the development and shuts the cover. This pounds the can which falls with the assistance of gravity into a canister for stockpiles. The canister can be discharged later so the individual can discard his can in an earth sound way. The creation has a cooler segment which is a thermally protected box like structure with a thermally protected cover. Essentially appended to the cooler area is a crusher be able to segment which is rectangular with a semi-roundabout base. The area has a smash that is connected to the cover of would crusher be able to segment with the end goal that when the top is shut the slam presses the can against the finish of the wood crusher be able to segment [10].

#### 4. Crushing Apparatus, Patent Number: 5257576

The device is for pounding utilized car oil channels, and for pressing out and gathering the grimy oil. The utilized channel is set on the platen of a cylinder, which is impelled straightforwardly by pneumatic weight. The cylinder has a region of 400 cm<sup>2</sup>, giving a smash power of 3 to 4 tones. There are no other moving parts related with the development of the cylinder. The cylinder platen is set in a chamber with a window for getting the channel, and an entryway stops the chamber amid pressing. A pneumatic outing valve is impelled by the demonstration of shutting the entryway, to pressurize the cylinder. The cylinder is guided in direction, containing pieces of hostile to grinding material set in the chamber dividers, which rub on indistinguishable surface from the pneumatic seal. The cylinder is overwhelming and returns under its own particular weight when weight is discharged. The seal/bearing surface of the cylinder is very much greased up by being sprinkled with oil from the pounded channel.

Notches in the platen coordinate streaming oil far from the entryway [11].

*5. Handling and Compacting of Empty Beverage Cans, Patent Number: 5251546*

A framework for recognizable proof, division and compacting of void refreshment jars including a first gadget for recognizing jars to be acknowledged and not acknowledged and dismissing non-worthy jars, and for identifying no less than one measurement of a can to be compacted, and for deciding a would redemption be able to esteem in light of such discovery, and a second gadget for compacting the can through communication of a three arm gadget, a first arm reaching a mid-segment of the can and packing that mid part, and second and third arms following up on end areas on either side of the mid-bit to pack the rest of the bits of the can. The arm gadget is withdrawn and the compacted can is expelled after the packing activity is finished by the arm gadget [12].

*6. Handling and Compacting of Empty Beverage Cans, Patent Number: 5249689*

A framework for ID, division and compacting of void refreshment jars including a first gadget for recognizing jars to be acknowledged and not acknowledged and dismissing non-adequate jars, and for identifying no less than one measurement of a can to be compacted, and for deciding a would redemption be able to esteem in view of such discovery, and a second gadget for compacting the can through collaboration of a three arm gadget, a first arm reaching a mid-segment of the can and packing that mid segment, and second and third arms following up on end areas on either side of the mid-bit to pack the rest of the segments of the can. The arm gadget is withdrawn and the compacted can is expelled after the packing activity is finished by the arm gadget [13].

*7. Can Crusher Apparatus, Patent Number: 5239920*

Can crusher contraption incorporates a barrel shaped lodging and a can accepting space in a lower segment of the round and hollow lodging. Jars fall into a transport line which transmits or transports the jars to a channel which passes on the jars upwardly and to a crusher. Ferrous jars stay in the transport by attractive components and get off the transport and are disposed of. In the wake of being smashed, the jars are transported upwardly via gaseous tension or a moving air stream to the upper bit of the lodging where they stay until the point when they are transported out of the contraption. The jars are moved out of the contraption via pneumatic stress which is the fumes bit of the gaseous tension connected to the course which transports the jars from the transport to the crusher [14].

*8. Plastic Bottle Crushing Device, Patent Number: 5233917*

A plastic jug smashing gadget that squashes the side of a jug in two ways in the meantime. The gadget incorporates an

empty lodging encompassing the plastic container which incorporates a couple of inverse divided separated pounding individuals mobile between a vacant position and a shut position that combine toward each other in a first course. Collapsing boards pivoted to each other and to the edges of the devastating plates move all the while with the devastating plates amongst open and shut positions to merge internally a second pressing way which is opposite to the principal smashing course. Rigging driven strung individuals are used to drive the devastating plates and pressing boards between their separate open and shut positions [15].

*9. Household Separating Compactor, Patent Number: 5221052*

A family unit compactor and separator uses straight movement in squashing glass and metal deny for comminution and division. A devastating component arranged on a worm shaft presses reject against a steel grind, broken glass falling there through into a glass container. Pressed metal jars fall into a metal container when the mesh is discharged to swing downwardly. The mesh is reestablished to its unique position by pulling control lines by means of a handle, and the mesh is anchored by solenoid worked hooks. The worm shaft is driven by an electric engine working through an apparatus box. The compactor is housed in a walled in area having upper and lower entryways and pushbutton controls situated in the front. Decline is embedded through the upper entryway into a compaction chamber. The glass and metal containers are expelled through the lower entryway for purging. Wellbeing switches sense entryway, mesh, and pounding component positions, restraining task if a perilous condition is detected [16].

*10. Can Crushing and Vacuuming Apparatus, Patent Number: 5218902*

A can crusher mechanical assembly having an end divider plate and a generally portable press plate specifically guided onto the end divider plate to pound can individuals there between. The end divider plate having longitudinally adjusted breaks contained there inside helpful with squeeze plate breaks to position can individuals to be pressed there between. An alteration of the creation incorporates vacuum complex structure to take out leftover liquids from inside can individuals to be smashed [17].

*11. Apparatus for Recycling Used Oil Filters, Patent Number: 5214830*

A mechanical assembly to recycle utilized oil channels is unveiled wherein oil channel canister of the sort having a base segment and a cover parcel encasing a creased channel component is put in an isolating means wherein the channel cover is isolated or sliced from the channel base to uncover the creased channel component. The oil channel cover is sent to a crusher, while the creased channel component is

sent to a turn means or rotator to expel abundance oil there from. Incidental parts are then expelled from the oil channel and sent to scrap receptacle. The creased channel component, having the oil expelled, is appropriate for use in landfills. The isolating means and the turn implies accommodate the accumulation of utilized engine oil in an oil store [18].

*12. Can Crusher Including a Ripper Tooth, Patent Number: 5213031*

A can crusher for smoothing jars is given which has a barrel shaped body having a first upstream end and a second downstream end. A liquid chamber having a cylinder bar is associated with the primary end of the body and a cylinder bar is mounted inside the body and joined to the cylinder pole for development from withdrew upstream position to an expanded downstream position. A release opening is given in the body adjoining the downstream end thereof. A can accepting opening is given in the body separated a separation from the release opening in any event equivalent to the most extreme can stature to be obliged by the can crusher. A ripper tooth broadens longitudinally inside the body from the can getting opening to the release opening. A control gadget specifically supplies pressure driven liquid to inverse finishes of the liquid barrel to move the cylinder between the withdrawn position and the stretched out position to at the same time empty fluid out of the can as it is pressed [19].

*13. Beverage Can Crusher, Patent Number: 5211109*

A drink can crusher has a couple of rollers which turn toward each other to squash a can between them. The crusher has a store window and chute which put the jars over the rollers and guarantee that the jars are straightened from the sides as opposed to crushed from the best. This accommodates a repeatable, bale able pressed can. An actuator put short of what one can length over the rollers in the chute invigorates the drive engine to pivot the rollers and keeps on having the rollers turning insofar as there is a can drawing in the actuator. The rollers have an extraordinary accepting surface and connecting with surfaces which hold the sides of the can to limit slipping so that the can will be pulled down between the rollers. What's more, pins expand radially outward from the external surface of the rollers to additionally grasp the can [20].

*14. Can Baling Machine and Method, Patent Number: 5203261*

A baling machine has an external lodging framing an extend, rectangular primary baling chamber with a release opening toward one side and a helper baling chamber crossing the fundamental baling chamber. A channel opening coordinates jars into the chambers at the convergence. An assistant cylinder is proportionally mounted in the helper baling chamber to pack jars to a first pressure weight in an underlying compaction organize,

while a principle cylinder is correspondingly mounted in the fundamental baling chamber to pack the compacted jars to a second pressure weight in a last compaction arrange in which a bunch of foreordained measurements and weight is shaped with no requirement for pre-measuring the jars [21].

*15. Can Crushing Apparatus, Patent Number: 5203262*

A lever-arm can pounding gadget including a base having a transfer opening broadening there through, a lever arm hingedly anchored to the base by a pivot with the end goal that the lever arm is mobile between a vacant position and a shut position, a can bolster surface for supporting a can neighboring the transfer opening before pressing and a can drawing in part on the lever arm for connecting with the can as the lever arm is progressed from the vacant position to the shut position. As the lever arm is progressed to the shut position, the drawing in part presses the can and propels the focal point of gravity of the can from being vertically situated over the help surface to over the transfer opening with the end goal that the can falls through the transfer opening when the lever arm is consequently exceptional to the vacant position. The can connecting with part draws in the can on an upper surface thereof on a side of the would upper be able to surface nearest the transfer opening [22].

*16. Assembly for Perforating, Crushing and Baling Crushable Objects, Patent Number: 5195429*

A get together to perforate, pounding and baling crushable items incorporates a container for accepting crushable articles at a first area. A transport moves the crushable articles from the main area to a second area. At the second area, a puncturing and pounding mechanical assembly gets the crushable questions and punctures them while pressing them to a level, plate-like setup. The items at that point move, under the power of gravity, to a baling mechanical assembly which packs the squashed articles into a bundle of foreordained arrangement [23].

*17. Can Crusher, Patent Number: 5188024*

A can crusher incorporates a ratchet bar having a majority of ratchet teeth longitudinally shaped on the bar and having a cylinder part anchored on a front end bit of the bar reciprocatively held in a pressing chamber framed in a base of the can crusher, a lever vitally anchored to a driving box anchored on a back bit of the base having a first pawl significantly mounted on a lower end segment of the lever engageable with the ratchet teeth on the ratchet bar, a second pawl urgently shaped on the driving box for keeping a rearward withdrawal of the ratchet bar, whereby upon an upward pulling of the lever, the principal pawl will encourage a ratchet tooth of the ratchet bar forwardly to crush a can embedded in the middle of the cylinder part and a pressure end plate anchored on the base, in this way progressively irregularly pushing the cylinder part forwardly to crush the can with a lighter power [24].

*18. Countertop Can Crusher, Patent Number: 5188022*

A mechanical assembly to crush work pieces incorporates a drive component having a rigging decrease prepare and a moveable rack part which is focused over a pressure plate for even, direct power transmission. Power is transmitted to the rack part on two inverse sides thereof by a couple of pinions which connect inverse columns of rack teeth. The pressure plate is basic with a couple of inverse guide sleeves, which are mounted for sliding development as for vertically broadening guideposts. A crimper component is mounted to the pressure plate for creasing the work piece before pressure. The blend of the enhanced drive prepare, which counteracts sticking of the mechanical assembly because of uneven power transmission, and the crimper instrument enables a generally little engine to be utilized in the unit, which expands its versatility, economy and reasonableness [25].

*19. Oil Filter Crusher, Patent Number: 5182988*

Device for smashing and seriously lessening the general measurements of utilized liquid channels previously they are disposed of incorporates a lodging get together having a base bit, a head part, and side divider partitions joining the base segment to the head parcel. First and second barrel shaped sleeves situated inside the lodging significantly totally encase each channel amid the devastating task. Amid the devastating activity, each channel lays on the base segment and a using pressurized water worked slam gathering powers a cylinder against the channel and pounds the channel between the base part and the cylinder. The side dividers parcels and the principal tube shaped sleeve confine parallel development of the cylinder and channel amid the devastating task. A lot of utilized liquid is re-guaranteed from the channels because of the devastating activity [26].

*20. Oil Filter Disassembly and Recycling Apparatus, Patent Number: 5182842*

A persistently cycling oil channel dismantling and reuse device and strategy including couple transport of channels and channel parts in a given divided connection to and from a dismantling office where the channels are cut while rotatably held by specifically depressible pins, and the dismantled segments moved to reuse containers orchestrated to get the segments dispersed as expelled from the dismantling office [27].

*21. Disposal Compactor for Aerosol Cans, Patent Number: 5181462*

A programmed compactor-crusher for handling spent vaporized shower jars securely depressurizes, clears, and presses jars for consequent naturally stable transfer as well as reusing. Liquid buildup is securely caught inside a repository. A vertically upright, supporting edge anchored to a story in the work zone underpins an extending can recipient gathering. The recipient get together matingly gets jars for preparing. A water powered crusher gathering

situated over the casing packs jars against the collector get together with an extensible smash. The collector get together involves a tubular sleeve which coaxially gets a displaceable barrel. An unbending association at the base of as far as possible travel of the chamber, and sets up a liquid stream way into a holding tank. An unbending valve direct anticipating from the association mounts a liquid control valve for specifically blocking liquid escape from the collector, and an inflexible, can piercing spear which punctures jars after adequate slam relocation [28].

*22. Can Crushing and Storage Unit, Patent Number: 5179893*

A gadget for squashing aluminum jars has a cover that can be locked in with a repository, and an opening through which smashed jars can drop is framed in the top. A lodging is mounted on the top, and the lodging shapes a channel. The lodging has a shut surface situated against the top, an open side inverse the shut surface, and a shut end. An opening is framed through the shut surface and is compared with the gap of the top. A devastating plate is correspondingly arranged in the channel and can be advanced toward the shut end of the opening. At the point when a can is to be smashed, it is laid on its side in the channel, and the plate is moved to pivotally pack the can against the shut end of the lodging. At the point when the can has been adequately packed, it drops through the opening into the container [29].

*23. Hand Held Aluminum Can Crusher, Patent Number: 5176072*

A hand held and hand worked gadget for compacting and pressing an aluminum refreshment can is unveiled. The gadget includes a prolong handle that is gotten a handle on by the client's hand. An aluminum can is held in a gripper component toward one side of the handle. The free end of the aluminum can reaching out from the gripper component is then beat against a strong protest in a way like beating one's held clench hand against a table best subsequently pounding and compacting the aluminum can [30].

*24. Apparatus for Crushing Articles such as Oil Filters or the like, Patent Number: 5174199*

An oil channel crusher incorporates a lodging inside which a cylinder gathering is mounted for responding development. The crusher is connectable to an outer wellspring of pressurized air, and an air valve is situated in the inside of the lodging for controlling supply of pressurized air to the cylinder get together. An entryway is mounted to the lodging for development amongst open and shut positions. An actuator course of action is given between the entryway and the air valve, for impelling the air valve after shutting of the way to start a devastating stroke of the cylinder gathering. A locking course of action is given between the cylinder get together and the entryway, to keep the entryway from being moved to its vacant position amid the devastating stroke of the cylinder get together [31].

*25. Compacting and Selecting Machine for Solid and Ferrous of Non-Ferrous Metallic Refuse such as Containers, Cans, Bottles, and Similar, Patent Number: 5167184*

A compacting and choosing machine for strong decline, for example, compartments and comparative incorporates a stacking container furnished with a finder and guide of articles, a devastating press toward the finish of the container, a parallel transport line to which the question leaving the press is coordinated by a horizontal ejector, the transport line being situated over an attractive plate for the maintenance of ferrous or comparable items, and no less than two gathering receptacles for the chose objects, one of these canisters being for non-ferrous materials and the other for ferrous materials chosen by the attractive plate, the machine cycle being completed with the guide of assistant control gadget [32].

*26. Apparatus for Recycling Oil Filters, Patent Number: 5165334*

A change for a contraption for reusing oil channels empowers squashed oil channels to be expelled from the compartment, in which they are pressed to expel utilized oil there from and to render them securely dispensable, by a mechanical means. The change includes the utilization of a U-formed part arranged through an opening at the base of the devastating compartment. Mechanical means pull the arms of the U-molded part from the devastating compartment, subsequently empowering the base of the U-formed part to clear pressed oil sift through the opening. The devastating compartment has an entryway which require just be opened to acquaint oil channels with be smashed [33].

*27. Food Press, Patent Number: 5163362*

A sustenance press, having an extended body incorporating a forward end with holes through which squeezed foodstuffs can pass, and chamber implies nearby said forward end for accepting and squeezing foodstuffs. A responding cylinder is slidably fitted inside the chamber implies for moving and squeezing foodstuffs, wherein the cylinder is adjusted to be situated rearward of the foodstuffs in the chamber implies in its withdrawn position and against said forward end for squeezing the foodstuffs through the holes in its forward position. The press additionally has a rotatable handle essentially associated with the stretched body rearward of the cylinder, and connecting implies which are associated with the handle and to the cylinder. At the point when the handle is turned one way the cylinder is moved to its withdrawn position to permit the chamber intends to get foodstuffs. At the point when the handle is pivoted the other way the cylinder is propelled to its situation for squeezing foodstuffs through the holes [34].

*28. Can Flattening Apparatus, Patent Number: 5158013*

A novel can straightening mechanical assembly and process is given including a for the most part rectangular lodging

having side dividers and a front compaction plate with the lodging characterizing a passageway opening and a leave opening, a rotate pole stretching out through the lodging, a couple of arms steadily connected to the turn pole and having rollers appended at the contrary closures thereof, a flattener plate arranged inside the lodging and being critically joined to the lodging to such an extent that the flattener plate can fit flush against the front compaction plate, a structure for pleating the center of a can mounted to the highest point of the flattener plate, a hostage plate mounted to the structure for creasing the center of a can [35].

*29. Reverse Vending Apparatus having Improved Article Crushing Mechanism, Patent Number: 5152387*

A turn around distributing mechanical assembly to receive returnable refreshment compartments incorporates a lodging having an opening through which an unfilled drink holder is embedded in exchange for a redeemable coupon. Inside the lodging, a V-formed help trough supports the compartment while a transport line pivots the holder. An optical scanner examines the pivoting compartment to distinguish its inception, and upon acknowledgment that the holder is appropriately returnable electronically flags the contraption to issue a coupon. The compartment tumbles from the help trough and is redirected by a moveable diverter plate to both of two compaction roller sets, contingent on the material piece of the holder. Wedge-formed aides pipe the holder into the focal point of the touch between a first and a second, compaction roller to straighten the compartment. A cleared steel band encompasses the primary compaction roller [36].

*30. Apparatus having a Pivotal Arm for Crushing Cans, Patent Number: 5142974*

The can smashing gadget revealed thus includes a base plate which has an upper mobile arm essentially associated toward one side of the base plate, said base plate having an arm unbendingly associated with said base plate with the inflexible arm having its upper surface generously in indistinguishable plane from the upper surface of said base plate and said arm being associated with said base plate at a position other than the finish of said base plate where said portable arm is associated. The mobile arm has a bar inflexibly associated thereto and broadening considerably oppositely in this manner and in a situation to descend on said arm unbendingly associated with said base plate [37].

*31. Wooden Crusher for Recyclable Metal Cans, Patent Number: 5138941*

There is unveiled a can crusher framed completely of wood parts that can be effortlessly manufactured by a novice carpenter. The can crusher has a channel body which, at its upper end, gives a slide to a mechanical wooden smash and, at its lower divide, a devastating station to get and press aluminum refreshment jars. The front of the crusher is secured with a defensive plate which limits access to the slide over the can, along these lines forestalling one, for

example, a tyke, from embedding's fingers between the can and the smash. The smash is carried on the finish of a push bar which is connected to a lever which has its support at an area, in respect to the turn interface between the pole and the lever, which safeguards that the slam moves over focus toward the consummation of the stroke, along these lines pulling back the smash from the can and counteracting sticking of the devastating system [38].

*32. Compactor for Automotive Oil Filter with Support Frame, Patent Number: 5136934*

A compactor for car oil channels is outlined wherein an upright water driven chamber D is its lower end upon a vertical lodging An open on one side for gathering of an oil channel and for evacuation thereof after compaction with a focal path F in a lower bolster C for alleviating pneumatic force created amid pressure and compaction [39].

*33. Aluminum Can Crushing Apparatus, Patent Number: 5133252*

A physically worked aluminum can pressing device is unveiled. The mechanical assembly includes an upper surface and a lower surface. A midway found upwardly expanding bulge is unveiled and characterizes a cavity in the lower surface of the mechanical assembly. First and second arrangement implies are given that are adjusted to contrastingly get an aluminum can to be squashed and to adjust a similar opposite to the hub of the connected pounding power. Discretionary handles and grasping surfaces might be given [40].

*34. Device for Crushing Cans and Cutting Plastic Containers, Patent Number: 5125333*

A gadget for pounding jars and slicing plastic holders to encourage proficient, space-sparing capacity, conservative transfer, and reusing of the material. The gadget incorporates an unbending base part adjusted for situation on a level surface, a handle plate divide crucially associated with the base part and adjusted for squashing jars, a handle anticipating apparently from the handle plate partition and adapted for manual grasping, and a longitudinally-broadening groove situated on the base part. A couple of oppositely-arranged etched breaks for holding a can upright while the handle plate parcel is turned descending for connecting with and smashing the can are found contiguous the depression. A removable pounding plate is adjusted for situation over the notch to help a can situated the long way subsequently to crush by the handle plate partition. Anticipating up through the notch is a rotational cutting edge which is driven by an engine unit situated inside the base part [41].

*35. Device to Crush and Extract Oil from Oil Filters, Patent Number: 5125331*

The created gadget incorporates a chamber in which articles to be pressed are set, a bulkhead toward one side of the chamber, a plunger working in the chamber to pack articles

against the bulkhead, a gathering region adjoining the chamber for gathering fluid extricated from the articles and furthermore to collect the articles after they have been squashed, and a plate that compasses any fluid and the articles from the accumulation territory into suitable repositories [42].

*36. Can Crusher, Patent Number: 5121685*

A can crusher contraption is displayed for smashing aluminum jars into a pressed relationship wherein the upper and lower roundabout end faces are for the most part unaltered and adjusted in a co-planar position, the pounded design achieved by the aftereffect of putting the can in an opposite position to a lengthened rectangular squashing plate for wrinkling a middle segment taken after by moving a slam plate and can into contact with a vertical divider. The devastating movements of the crusher are accomplished through double cam and space implies agreeably drivable associated with a power exchange square which grants a foreordained connection interpretation movement of the plates in light of turn of the exchange square [43].

*37. Automated Recycling Machine, Patent Number: 5111927*

A refreshment holder reusing machine is uncovered. The machine incorporates a first module for getting and dealing with plastic compartments, a second module for accepting and taking care of glass holders and a third module for getting and taking care of metal compartments. Every one of the three modules is contained in a similar lodging or capacity unit. Ideally, the machine incorporates at least one coupon containers for administering redeemable coupons and the machine is strategically placed almost a store or other outlet at which the coupons can be reclaimed. Every one of the three modules is independently gotten to yet their activities are, ideally, under the basic control of a solitary processor unit. The lodging likewise contains a different coin apportioning unit for every one of the three modules and in one exemplification, the two coins and a coupon are endless supply of an adequate compartment in the suitable module [44].

*38. Oil Filter Crusher Unit, Patent Number: 5109763*

An enhanced oil channel crusher unit is given to use in recouping utilized engine oil from an oil channel of the sort utilized in car vehicles and for diminishing the volumetric size of an oil channel before transfer with other waste in a landfill or something like that. The crusher unit incorporates a devastating cylinder gathering having a pneumatic cylinder associated by means of a bearing less cylinder shaft to a channel pressing head. An air circuit framework gives pressurized air to the cylinder gathering to propel the devastating head into commitment with an oil channel arranged inside a devastating chamber. A control lever outwardly of the unit mechanically interlocks with a security way to avert access to the devastating chamber amid unit task. What's more, the geometry of the

devastating head joins at least one projections which start channel squashing by pleating limited zones of the channel and in this way debilitate the channel so smashing can be expert with generally low pinnacle pound powers [45].

*39. Aluminum Can Recycling Appliance and Method, Patent Number: 5103721*

A family unit reusing apparatus for reusing aluminum jars. The apparatus has a lodging containing a vertical pressing chamber with a frontal opening into which an unfilled aluminum can is to be embedded. The base plate of the devastating chamber, filling in as a plunger or cylinder, is progressed upwardly by an engine and ringer wrench get together to smash the can against the settled best plate. As the base plate retreats, a spring-worked lever discharges the smashed can rearward through a channel into a can capacity container which is estimated to hold a specific number of pounded jars. Any lingering liquid depleting from the smashed can is gathered in a liquid stockpiling container situated underneath the can capacity repository. The can and liquid stockpiling containers are removable for exchanging the squashed jars and discarding the liquids [46].

*40. Scraping Device for Can Crushing Apparatus, Patent Number: 5095815*

A gadget is accommodated discharging jars sticking to an external divider surface of a devastating roller and additionally an inward divider surface of a tubular drum in a can pressing mechanical assembly. To evacuate jars clung to the roller, a scratching instrument is customizable mounted on a help arm of the can squashing device. To expel jars from the internal divider surface of the tubular drum, a second scratching instrument is flexibly mounted on a help of the can pounding mechanical assembly [47].

*41. Can Crushing Machine, Patent Number: 5094157*

A can pressing machine containing a first crusher gadget for smashing a can from a side of the can with the end goal that a first side of the can is constrained towards a second side of the can and to such an extent that closures of the can are caused to rotate deep down towards each other and towards the second side, a second crusher gadget for following up on the turned finishes of the can to additionally squash the can, an attractive separator for holding steel based jars yet not aluminum based jars whereby the attractive separator can isolate steel based jars from the aluminum based jars amid utilization of the can pounding machine, and an agent gadget for moving all jars set in the can pressing machine against a stop part [48].

*42. Rotating Drum Container Crusher, Patent Number: 5092234*

A compartment crusher for pressing aluminum refreshment jars, two-liter plastic drink bottles, and so forth utilizes an engine driven rotatable drum in a lodging. Mounted on the fringe of the drum are a majority of calculated crusher arms which contact holders brought into the lodging and press

them between the turning crusher arms and the dividers of the lodging. Mounted over the lodging is a roundabout plate into which compartments to be squashed are set. The plate has a feed opening into the crusher lodging which is secured by a wellbeing spread which, thus, has a channel opening dislodged from the feed opening. Holders are brought into the feed opening of the security cover which is measured and situated in order to keep an administrator's hand from entering the crusher lodging. The crusher unit can be specifically appended to an ordinary 40-gallon junk can, or, on the other hand, can be set inside a traditional 55-gallon drum [49].

*43. Aluminum Can Compactor Fed with Bulk Cans, Patent Number: 5090308*

An aluminum can compactor incorporates a primary body settled on a settling plate mounted on a divider for accepting a can to be compacted stacked into a trough of the principle body from a container mounted on the fundamental body, a squeezing part asked by a driving gadget associated with a handle bar, and a collection pack hung under the principle body, whereby upon a bringing of the handle bar down to forward the squeezing part to crush a can in the trough, the compacted can be released and gathered into the accumulation sack for an effective can-compacting activity [50].

*44. Method for Disposal of Aerosol Spray Containers, Patent Number: 5088526*

A strategy for transfer of vaporized gadgets and the substance thereof, which includes cooling of the airborne container and its remaining substance to a temperature beneath which the fuel shows a generous vapor weight (i.e., underneath the bubbling point(s) of the propellant(s)). It is then conceivable to cut the holder without peril of an uncontrolled arrival of the substance. The chilly melted charge and any extra fluid substance of the splash compartment may then be depleted, with no risk of fuel discharge to the climate, into a gathering holder prepared to do in this manner pleasing the vapor weight of the force at surrounding temperature. The compartment is fixed while its substance are as yet cool and the fluid is permitted to achieve surrounding temperature, whereby the charge recovers its vapor weight and a portion of the fuel blend comes back to a vaporous shape [51].

*45. Apparatus for Collecting Articles, Patent Number: 5085308*

A device for gathering articles is housed in a parallelepiped packaging, on the front board of which is orchestrated a show some portion of a having influence. An article-return part with an article-accepting compartment is additionally given in the device. The front board of the packaging is subdivided into various fields of which one field shapes an entryway for an entrance to an article gathering holder. A gaming machine is orchestrated in another field, and the article-return part in the third field. The gaming machine is in any event somewhat unmistakable through a window so

its amusement can be seen. Expanded utilization of the mechanical assembly results from the perceivability as well as perceptibility of the diversion [52].

#### 46. Can Crusher Apparatus, Patent Number: 5078060

A device is given slanting an upper lodging containing separated parallel side dividers, with the side dividers including adjusted spaces. A crusher bar is organized to squash a can between stories of the lodging as the bar is coordinated through the spaces. A push bar is critically mounted to a back upper mass of the lodging to extend a pressed can into a capacity holder removable mounted to a lower forward mass of the lodging [53].

## II. SUMMARY AND CONCLUSION

The point of this paper is to introduce a review study for patents for can crusher machines. This work is extremely helpful for any designer to get a natty gritty data of the early patents for the can crusher machines. The work here is limited between the period from 1992 to 1993. The examination exhibited a rundown for 46 inventions. The inventions are displayed via titles, patent number, name of the designer, the patent issued date and a summary overview. This survey work is thinking to be helpful for innovators took a shot at patents for can crusher machines.

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