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Beverage Cans Crusher Machine Patents: A Review: Part I

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***Abstract* - The aim of this paper is to present a review study for patents of can crusher machines. This review is very useful for any inventor to get detailed information of the early patents for the can crusher machines. The review here covered the patents between the period from 2008 to 2018 (include my patent in 2016). The study presented a summary for 45 patents, however, detailed descriptions for each patent are going to be presented in a separate study. The current study presented title of each patent, patent number, name of the inventor and the patent issued date. This review work is thinking to be useful for inventors worked on patents for can crusher machines.**
Keywords: **Patents, Can Crusher, Machine, Review, Period 2008−2018**

I. A BRIEF SUMMARY of CAN CRUSHERS PATENTS

Different patents for can crusher machines are summarized in the current review article, as discussed below. The study here is dedicated for an overview of patents, however, details of patents could be shown in separate studies; you may see, e.g., [1,2].

1. Disposable Patient Tag, Patent number: 9965657

A mechanical assembly, framework and strategy to track area, the contraption including: a considerably planar dispensable lodging involving a gadgets compartment; an auxiliary innovation sensor arranged along a fringe of the expendable lodging; a hardware module arranged inside the gadgets compartment, the hardware module containing: a processor coupled to a memory; a RF handset coupled to a RF receiving wire and to the processor; an optional innovation handset coupled to the processor; and a battery coupled to the device, wherein the battery isn't field-replaceable. The device may additionally incorporate a checking to show a foreordained timeframe that the device is operable. Encapsulations additionally incorporate an unattended shrewd compartment to self-sufficiently gather a majority of the device and to report status to a focal screen framework [3].

2. Apparatus for Purging and Rinsing A Chemical Container, Patent Number: 9873138

A mechanical assembly to purge and flushing a compartment having longitudinal finishes, an upper sheet, parallel dividers, and a lower divider, the device having an edge characterizing a preparing space; a punch situated to overlie the holder's upper sheet; a kick the bucket situated to underlie the compartment; a majority of twist opposition mitigating compartment divider cuts situated for sectioning the holder between its longitudinal closures; a majority of direct movement actuators associated operatively to the punch or associated operatively to the bite the dust for reducing the pass on descending relocation from the punch, for bowing the compound holder's upper bendable sheet about the punch, and for spreading the holder's longitudinal finishes; and a majority of wash spouts associated operatively to the edge for showering water into the opened holder [4].

3. Vending System with Recyclable Packaging having Automated Deposit And Return, Patent number: 9454869

Candy machines and allocators, gadgets, contraption, frameworks, and strategies for giving and utilizing a candy machine that apportions merchandise in recyclable and reusable bundling having mechanized stores and returns for the bundling. Clients buy things, for example, items, products, fluids and gasses in reusable compartments having electronic labels from mechanized candy machines. Clients pay for the things at time of procurement alongside an additional cash store expense for utilizing the reusable compartment. Electronic activator labels fixably appended reusable holders are distinguished when the compartments are returned which triggers a sensor taking into account the stores to be come back to the client [5].

4. Modular Garbage Collection Apparatus, Patent Number: 9272842

This invention gives a mechanical assembly to recognizing and arranging some portion of reusing plastic jugs and aluminum jars. The creation facilitates the way toward arranging recyclable material at the reuse receptacle to maintain a strategic distance from the arranging later all the while. Subsequent to arranging the material, the reuse container packs the jugs or the jars to suit more material into the relating material compartment. The innovation is a measured plan permitting simplicity of supplanting any of the three units of the contraption: pressure, characterization, and capacity [6].

5. Vending System with Recyclable Packaging having Automated Deposit and Return, Patent Number: 9245404

Candy machines and distributors, gadgets, mechanical assembly, frameworks, and techniques for giving and

utilizing a candy machine that administers merchandise in recyclable and reusable bundling having robotized stores and returns for the bundling. Clients buy items, for example, kindling in recyclable holders having electronic labels from mechanized candy machines. Clients pay for the item at time of procurement alongside an additional cash store expense for utilizing the recyclable holder. Electronic activator labels fixably appended recyclable compartments are recognized when the holders are returned which triggers a sensor taking into account the stores to be come back to the client [7].

6. Beverage Cans Crusher Machine, Patent Number: 4610

In this invention, a new outlined machine to smash jars with substantially less powers than others. The new plan applies two powers in level and third one in vertical ways; the even powers are connected initially amidst the can (in focuses just) and subsequently the can ends up feeble and needs a little vertical power to be squeezed to the coveted size. Moreover, the machine utilizes an inexhaustible wellspring of vitality as a power source, i.e. no charge of its task. The machine comprises of multi cylinders, two level and one vertical, sun based cell framework to work the machine, pneumatic framework, sensor, servo engine, controller, programming, and a wooden structure to contain all the machine parts. The machine is intended to be utilized in numerous spots (more often than not uncontained such machines, for example, in air ships, bathrooms, workplaces and even in autos; this innovation, in perspective of that, may constrain tossing refreshment jars in avenues or junk [8].

7. Compacting Device, Patent Number: 8910567

This development identifies a compacting gadget for compacting void compartments, specifically drink jugs or jars of plastic or metal, including no less than one rotatable roller, which is intended for packing and puncturing void holders, wherein the roller has a roller base body and no less than one stick component distending from the roller base body, wherein the stick component is framed as an empty stick, at any rate the end face of the empty stick that is confronting far from the roller base body is open [9].

8. Pneumatic Container Compacting Apparatus, Patent Number: 8904927

A pneumatic can crusher for compacting a metal can has an empty pipe. A cylinder get together is situated inside the pipe with a make a beeline for a first end of an associating bar and a base air chamber associated with a second end of an interfacing pole. In a few encapsulations, an opening is situated in the pipe close to the best end, for permitting the metal can to be embedded into within the pipe and set on a best surface of the leader of the cylinder get together. The pneumatic can crusher has a physically actuated security interlock worked by a foot of a client. Air from the air blower pushes the air barrel upward toward the best end of the pipe so to pound the metal can on the best surface of the leader of the cylinder get together [10].

9. Method of Reducing the Volume of a Non-Returnable Blow-Molded Brewery-Specific Beer Keg and Other Non-Returnable Containers, Patent Number: 8881647

This invention is a method of reducing the volume of containers such as a non-returnable blow-molded brewery-specific beer keg and other non-returnable containers [11].

10. Apparatus for Compacting Waste Objects, Patent Number: 8813643

A mechanical assembly to compact waste items incorporates a seat furnished with a help get together to support the waste question be compacted; a push part being moveable inside the seat for compacting being used of the contraption the waste protest against an end mass of the seat; the help get together including two help individuals that pivot far from each other for releasing the compacted protest through a gap. The help individuals can obstruct release of a compacted protest of a particular sort through the opening to gather the compacted question of the particular kind in a committed compartment. Projections can be connected to the push part and an end mass of the seat for creating dejections in the compacted protest so that the compacted question does not lose the compacted condition once weight connected by the push part is evacuated [12].

11. Device for Compressing of Empty Deformable Containers, Patent Number: 8783173

A device for packing void holders, specifically of drink jugs or refreshment jars made out of plastic, specifically out of polyethylene terephthalate PET, or tin plate. The mechanical assembly has a cutting and squeezing unit and in addition implies for driving and for controlling the cutting and squeezing unit, wherein the cutting and squeezing unit contains no less than two collaborating, oppositely pivoting rollers arranged at a separation in respect to each other concerning their revolution tomahawks, wherein every roller has a few circles for each situation arranged towards each other with a hub remove (free space). As indicated by an extraordinary further advancement it is suggested that in any event in the working area of the two rollers there are arranged pivotally alongside each other a first working locale for a compacting of holders made out of plastic and a second working district for a packing of compartments made out of metal [13].

12. Modular Apparatus and Method for Compacting Trash, Patent Number: 8776680

A junk compaction framework incorporates a waste container through which junk is input; a compaction chamber in which junk is compacted; and a compactor instrument operatively combined with the compaction

chamber to reduced junk toward a path for the most part opposite to a heading in which the compaction chamber gets the junk. The compaction chamber has a closeable accepting opening in correspondence with the waste container to get junk into the compaction chamber. The closeable getting opening is closeable by a portable cover situated between the junk container and the compaction chamber. The compaction chamber likewise has a closeable launch opening through which the compacted waste is catapulted [14].

13. Power Drill Operated Can Crusher, Patent Number: 8516956

A power penetrate worked can crusher includes a casing, a plate, and a screw drive system. The edge involves an empty round and hollow structure having an inward span estimated to contain a standard aluminum can and an opening on a base end for the inclusion of an aluminum can into the inside of the edge. The plate contains an inflexible roundabout plate with range equivalent to the internal span of the edge. The screw drive system includes a screw component which creates a straight mechanical activity of the plate by means of rotational movement of the screw instrument. The plate is associated inside the casing and parallel to the round countenances of the edge by means of the screw drive system. The best end of the screw driver component contains a power penetrate connector, which enables a client to turn the system with a standard power bore [15].

14. Soda Can Crusher, Patent Number: 8479647

A can squashing device for pounding a can is displayed. The can pounding device incorporates a lengthened structure, a cylinder drive get together, a can pressing chamber, a can holding plate, a redirector direct, a control, a security switch, a push catch switch and a connection implies. The cylinder drive get together incorporates a cylinder intended to pound the can. The cylinder incorporates a mallet connected with a sledge plate and a round and hollow lodging for anchoring the cylinder. The sledge is extendable a descending way and retractable an upward way. The redirector direct exchanges a pounded can to a can gathering receptacle. The control gives electric capacity to the can pounding mechanical assembly. The security switch anticipates hand wounds caused by the unintentional situating of hands by a client on the crusher [16].

15. Container Crusher, Patent Number: 8453564

A device that pounds refreshment jars and comparative compartments to lessen squander volume in reusing containers involves two metal platens held when shut by a pivoting system that permits one of the platens to be moved far from the other. The surfaces of the platens which confront each other are furnished with a finished or ribbed surface to keep the protest be pounded from slipping out from between the end platens. A first platen is mounted onto a couple of mounting sections and a second platen is connected onto a couple of moving connections. A couple of parallel working arms is interconnected by a handle and works the associated pivoting component. The pivoting system gives a flip activity which creates a satisfactory power between the platens to squash the compartments. At the point when the handle and the pivoting system are come back to the beginning position, the opening between the platens enables the pounded question drop out into the reusing canister [17].

16. Portable Electric Can Crusher, Patent Number: 8448570

A versatile electric can crusher is uncovered that squashes jar, at the "purpose of gathering". The can crusher squashes jars into a smashed relationship wherein the upper and lower round end faces are for the most part unaltered and adjusted in a co-planar position, the pounded design achieved by the consequence of putting the can in an opposite position contiguous a slam plate and a prolonged rectangular pressing plate which is utilized for wrinkling a middle bit of the can took after by moving the smash plate against the can into contact with an inflexible vertical divider. The devastating movements of the crusher are accomplished through double cam and opening means agreeably drivably associated with a power exchange square which gives a foreordained connection interpretation movement of the plates because of pivot of the exchange square. A powerful battery-powered battery gives the power important to pound jars quicker and all the more gainfully [18].

17. Apparatus for Assembly of a Press-Fit Modular Work Piece, Patent Number: 8424194

A mechanical assembly to assemble a press-fit secluded work piece is depicted that incorporates a surface part having a focal opening. A bring forth part is arranged on one side of the surface part, and is moveable between a first position where it doesn't cover the opening and a second position covering the opening. A work piece getting part is arranged proximate the opposite side of the surface part opposite the focal opening for accepting segments of the press-fit measured work piece. An actuator moves the work piece getting part toward the opening so segments of the work piece press against the incubate part when the bring forth part is moved into the second position. The actuator moves the work piece getting part to a situation to get segments of the work piece when the bring forth part is in the principal position [19].

18. Bottle Compactor, Patent Number: 8342084

A compactor gadget includes a round and hollow lodging having a prolong channel for accepting a jug to be compacted in that and lengthen manage openings, an end top joined to a first end of the lodging for seating the jug

and securing the neck end of the jug, a cylinder slidably arranged inside the channel and having a forward slam for stuffing the jug, and a lever for activating direct development of the cylinder inside the channel, regardless of whether physically or computerized [20].

19. Can Crusher, Patent Number: 8307763

This can crusher is a gadget fit for compacting aluminum and steel jars. The gadget fuses a wheeled base that backings subsequently a get together that incorporates a holder for lodging the jars and components for pressing the jars. The devastating instruments incorporate a water driven jack, a sliding wrench framework, augmentation springs, a solitary stage, outfitted engine, a versatile plate and a weight measure [21].

20. Method and Apparatus for Forming Self-Supporting Bales of Metal Cans, Patent Number: 8171846

Mechanical assembly to form a self-supporting brew of metal jars involving a baler adjusted to smaller metal jars into a parcel. Inverse side dividers of the baler incorporate a cluster along each side mass of parallel open-confront grooves. A platen having characterized along every one of its contrary sides dividers, a variety of projections adjusted to be gotten inside separate ones of the divider grooves in cross section relationship whereby development of the platen along the length of the baler capacities to minimized the jars arranged inside the depressions to a higher level of densification than the level of densification of jars proximate the focal segments of the parcel [22].

21. Pneumatic Can Crushing Apparatus, Patent Number: 8122824

This invention includes a pneumatic can pounding mechanical assembly to compact jars containing a pipe having a cylinder get together, wherein the cylinder gathering is associated with an air blower by means of hoses and valves. Compacted air makes the cylinder gathering move and squashes a can or bottle inside the pipe [23].

22. Container Compression Device and a Method for Implementing Same, Patent Number: 8074567

A compartment pressure gadget and a technique for partner a drink holder with the holder pressure gadget is given, wherein the holder pressure gadget is configurable between a broadened setup and a compacted arrangement, compartment pressure gadget including a first handle partition, wherein the main handle parcel incorporates a majority of first handle divide connecting individuals pivotably connected with the principal handle parcel. The compartment pressure gadget additionally incorporates a second handle partition, wherein the second handle parcel incorporates a majority of second handle divide connecting individuals pivotably connected with the second handle divide. Also, the majority of second handle parcel connecting individuals are rotatably associated with the majority of first handle partition connecting individuals by means of no less than one releasable locking gadget, wherein the no less than one releasable locking gadget is configurable between a drawn in design and a separated arrangement [24].

23. System to Form Repeatable Shaped Slugs from a Plastic Bottle, Patent Number: 7971524

A robotized framework for delivering a slug having a repeatable shape from a plastic container, the mechanized framework involving: a lodging having a prolonged shape, a hub toward a path of extension, and an opening arranged to get the jug in a by and large coaxially introduction with the lodging; a compacting subsystem adjusted to minimized the jug considerably in a first bearing inside the lodging; and a slug handling subsystem adjusted to frame a slug having a basically predefined shape from the compacted bottle, the slug preparing subsystem adjusted to shape the slug by use of power in no less than a second course, significantly typical to the main heading; wherein the slug preparing subsystem is adjusted to shape a slug from a solitary compacted bottle; wherein the slug handling subsystem is designed to shape a slug having a leveled geometric shape; wherein the smoothed geometric shape is a polygon having a trademark measurement under 90 millimeters [25].

24. Plastic Bottle Crushing System and Method, Patent Number: 7913617

A compartment with an entryway shapes a working chamber. A devastating zone inside the chamber is characterized beneath by a help or more by a vertically reciprocable smash. A driving get together raises and brings down the smash to smaller a plastic jug in the devastating zone. A warming component mollifies the plastic container. A software engineer is operatively coupled to a majority of controls for getting working guidelines and to the warming component and the driving gathering to in this manner cause a proper cycle of task for smashing and compacting the plastic jug [26].

25. Can Crushing Apparatus, Patent Number: 7806047

A can compacting mechanical assembly incorporates a base and an accepting container with an end divider and a couple of side dividers expanding upwardly from the base. The base has a gap situated nearby the end divider. A drive get together is mounted to the base. The drive gathering incorporates an arm having a free end that stretches out into the getting canister and pushes toward the end divider when the drive get together is activated in a first course and far from the end divider when the drive get together is incited in a second heading. A can is situated in the getting container and squashed between the free end of the arm and the end divider when the drive get together is activated in the main heading. The can then falls through the gap when the drive gathering is impelled in the second bearing [27].

26. Can Crusher, Patent Number: 236430

This can crusher is a gadget equipped for smashing aluminum and steel jars. The gadget fuses a wheeled base that backings consequently a get together that incorporates a compartment for lodging the jars and systems for smashing the jars. The devastating instruments incorporate a water driven jack, a sliding wrench framework, augmentation springs, a solitary stage, outfitted engine, a portable plate and a weight check [28].

27. System to Form Repeatable Shaped Slugs From a Plastic Bottle, Patent Number: 255421

A framework for creating a slug having a repeatable shape from a plastic jug, including: a lodging having a lengthened shape, a pivot toward stretching, and an opening arranged to get the container in a by and large coaxially introduction with the lodging; a compacting subsystem adjusted to minimized the jug significantly in a first course inside the lodging; and a slug preparing subsystem adjusted to frame a slug having a predefined shape from the compacted bottle, the slug handling subsystem adjusted to shape the slug by use of power in no less than a second heading, generously ordinary to the main bearing [29].

28. Compressing Device For Plastic Bottles Optimized for Recycling Machines, Patent Number: 7591222

A compacting gadget for plastic containers improved for reusing machines giving painstakingly formed first and second plates with one being for the most part arched while the other being curved in order to mate all the more totally and give a leveled bottle, prepared for reusing. Likewise, a tail serves to adjust the base of the container with the goal that the scanner tag stays noticeable when the jug is gone through a robotized reusing machine. There are two exemplifications one has as part a stand and a tongue while another epitome is without a stand and has a hingedly versatile tail. Additionally, the tongue and the tail are arranged and formed to acknowledge an assortment of jug base setups and are likewise utilized for definitely adjusting the base of the container for enhancing the manner in which the jug is compacted [30].

29. Power Operated Container Crushing Device, Patent Number: 7552676

A power worked compartment pounding gadget, the gadget involving: an upper lodging; a lower lodging indispensable with the upper lodging; and a devastating system containing an engine connected to and held in upper lodging, wherein said engine incorporates an engine hear for rotational commitment with a drive adapt; a drive hub with the drive equip fixably joined toward one side for turn thereof and intends to append the drive hub to a strung sleeve at the other; a prolonged strung sleeve fixably joined to the drive hub for revolution thereof; a strung shaft for threadably captivating the strung sleeve; and a devastating plate fixably connected to the strung shaft; wherein when the engine pivots the engine outfit one way, the devastating plate moves a descending way, and when the engine turns the other way, the devastating plate moves an upward way [31].

30. Domestic Plastic Bottle Shredder, Patent Number: 7546965

The innovation is a local plastic jug destroying machine. The machine has a pressure driven smash get together situated over the destroying component so any plastic, glass, paper, or aluminum that is acquainted will be leveled earlier with being destroyed. A waste receptacle is situated underneath the destroying system with the end goal that the capacity procedure is driven by gravity. The machine is intended for household uses with the end goal that the state of the machine takes after a little refuse can. The essential component of this creation is to help the reusing procedure by destroying plastic, glass, paper, or aluminum ahead of time of the reusing procedure [32].

31. Device for Pressing Empty Containers Together and Method therefor, Patent Number: 7540235

A strategy for squeezing together void compartments, particularly drinks jugs or jars made of plastic, particularly PET or tinplate, involves a lodging with a fill opening and an outlet, a cutting and squeezing arranged in the lodging, and a gadget for driving and controlling the cutting and squeezing unit. The cutting and squeezing unit contains no less than two rollers whose tomahawks of revolution are orchestrated at a separation from each other. Every roller has no less than two areas. Adjoining areas along a similar roller have diverse distances across. At the point when the rollers are mounted, the segments having the bigger breadth are balanced in respect to each other and the fringe surfaces thereof mostly cover with each other, shaping cutting circles whose fringe surfaces have no less than one furrow [33].

32. Can Crushing Device, Patent Number: 7536948

A can squashing gadget, which presses the can along its round and hollow pivot, bolsters the can on a can stage, scratches the side of the can and levels the can. A can chute or feed container sustains jars to the press chamber, while different gathering gadgets get the pounded jars [34].

33. Waste Compactor with Interior Basket, Patent Number: 7490545

A framework and mechanical assembly to crush squander material that is manual and versatile. On the underside of the top to the contraption is a separable handle with a plate appended thereto that has a progression of harsh edges. The handle can plummet down the stature of the mechanical assembly through a couple of parallel channels situated down the front and back of the contraption. At the base of the contraption on the inside is a mating plate that has a second arrangement of harsh edges that fit like a zipper with

the edges of the best plate for pressing of waste. The handle is lockable through hooks to the top of the device when not being used. A second secure holds the idea about the back of the mechanical assembly when not being used. An inside removable bin with foldable handles as well as grasping openings as an afterthought. The inside container has channels on the front and back dividers that compare to the fundamental body parcel [35].

34. Bottle Crushing Device, Patent Number: 7475633

A commendable strategy, mechanical assembly and arrangement of smashing a jug may incorporate a barrel for encompassing a jug. The barrel may have a fundamental body with a strung external surface. A plate might be slidably drawn in with an internal surface of the barrel at a first end of the barrel. A nut might be operably drawn in with the strings on the external surface of the barrel. A tab part might be indispensable with the plate and the tab partition drew in the nut. A top might be repeatably appendable to a finish of the barrel inverse the plate. Development of the nut may encourage development of the plate and moving the plate toward the top may smash a jug inside the barrel [36].

35. Wall Mounted Can Crusher, Patent Number: 7461592

A divider mountable can pounding mechanical assembly for self-bolstering and quickly rehashing manual smashing of drink jars or the like through client striking incorporates a lodging area for nourishing jars through a chute and keeping jars in a squash chamber before pressing. A punch cushion for accepting the client strikes is appended to a versatile bit conveying a squash cylinder from a withdrawn position into a pound position crashed into contact with a can in a smash chamber. The cylinder is one-sided to be come back to the withdrawn position after a can is smashed and a release permits a pressed can to freefall out of the mechanical assembly. Oddity highlights, for example, a weight enacted sound card or publicizing mounts might be added to the can crusher for limited time request [37].

36. Portable Can Crushing and Pickup Device, Patent Number: 7444931

A mix can squashing and recovering gadget having a roundabout or tubular lodging containing a plunger and having a rectangular opening in its side divider. The lodging has a blade edged marginally sunken indent on the base of the lodging, which indent for the most part adjusts to the curve area of the necked down bit of a drink can. At the point when the inward indent is set on the lip of a can laying on its side and constrained down the can will "snap" upright, through the rectangular opening and into the lodging. The can is then held in the lodging around the necked down part by a froth/elastic covering situated at the lower inside end of the lodging. At that point the weighted plunger is constrained down onto the can, pressing the can. By setting the finish of the gadget holding the can into a bigger repository the can may then be shot out from the gadget by squeezing an ejector bar [38].

37. Propane Bottle Recycler, Patent Number: 7434506

A propane bottle recycler including a jug station, first and second propane gathering tank, blower, fluid propane stockpiling tank, bottle crusher, and smashed container stockpiling compartment. The container station includes a jug complex and jug station outline, and the jug complex is urgently associated with the jug station outline. Propane bottles are put in getting cavities in the jug complex and held set up with cam levers, and the container complex is raised to a vertical position. The propane depletes out of the propane bottles, through propane hoses into a propane complex, into the first and second accumulation tanks, and to a blower, which repressurizes the propane. The propane is then put away in a fluid propane stockpiling tank. The utilized propane bottles are pounded by the container crusher and put away in the pressed jug stockpiling compartment [39].

38. Two Stage Oil Filter Press, Patent Number: 7421946

A two phase oil channel press having a lodging with a precompression chamber and a principle pressure chamber together with a vertically responding precompression slam and an on a level plane responding fundamental pressure smash controlled by singular liquid barrels. A feed chute with a scoop is brought through a void up in the container made by a perplex which protects bolstering a deliberate amount of spent oil channels to the precompression chamber through a feed window. A principle pressure chamber is characterized at the lower end of the precompression chamber by the lower flat end surface of the precompression slam, the floor, a couple of side dividers of the precompression chamber, the push end of the primary pressure smash and a release entryway [40].

39. Container Closer, Patent Number: 7401447

A closer to press a cover onto a compartment incorporates a presser foot mounted for responding development into and out of power applying commitment with the top; an actuator moveable amongst withdrawn and expanded positions; and a power duplicating get together arranged in agent relationship moderate the presser foot and the actuator for increasing an information compel from the actuator to a foreordained greatest top squeezing power at the broadened position [41].

40. Container Crusher and Method of use thereof, Patent Number: 7395755

A tasteful and valuable gadget for encasing a vacuum pump inside a confined nook for the departure of air from utilized compartments is thus revealed. A walled in area for a vacuum pump includes a locking access entryway, a top, and a holder arranging region that expands descending,

viably lodging a vacuum draw bolstered by an inside rack. A vacuum chamber for gathering any entrained fluids or solids from utilized compartments is coupled toward one side to vacuum plumbing reaching out from the gulf of the vacuum pump and at the opposite end to a holder connector. The compartment connector has a ventured female width opening to oblige different estimated holder mouths. A fixed and locked get to entryway keeps up the honesty of the vacuum chamber and additionally gives a tasteful and defensive cover for the vacuum pump [42].

41. Waste Compactor, Patent Number: 7395757

A framework and mechanical assembly to crush aluminum jars, plastic holders and other crushable waste that is manual and versatile. On the underside of the top to the contraption is a separable handle with a plate joined thereto that has a progression of harsh edges. The handle can drop down the stature of the mechanical assembly through a couple of parallel channels situated down the front and back of the contraption. At the base of the mechanical assembly on the inside is a mating plate that has a second arrangement of harsh edges that fit like a zipper with the edges of the best plate for squashing of waste. The handle is lockable through hooks to the cover of the mechanical assembly when not being used. A second secure holds the idea about the back of the device when not being used. The base of the mechanical assembly has at least one sets of wheels to take into consideration simple convenientce [43].

42. Cylindrically-Shaped Can Collection Bin for Use with Aluminum Can Compacting Mechanism, Patent Number: 7387066

An enhanced can compacting component incorporates a would collection be able to container involving a body having a vitally framed and circularly formed sidewall. Downwardly from the tube shaped sidewall is a story. The sidewall and floor are necessarily framed into a solitary structure. Upwardly from the sidewall is a body neck and opening. The body neck is, in cross-segment, a by and large rectangular-molded structure and the body opening is a for the most part rectangular-formed gap through which compacted jars are expected to go as they drop by gravity from the can compacting system of earlier innovation. The sidewall is a bearer for indicia connected to the sidewall or to a name or wrap that encompasses the sidewall [44].

43. Self-Standing Aluminum Can Crushing Device, Patent Number: 7360484

The present innovation is a self-standing unit intended to minimal aluminum jars. A stand is associated with a vertical lodging, which is dug out and contains a can space, an opening for a handle, and a majority of openings for a majority of springs to work. Associated with the vertical part are the springs, which additionally interface with a devastating gadget. The devastating gadget fits inside the empty segment of the vertical part and has the handle situated close to its highest point. The innovation is spring stacked so that the can space ordinarily remains open for putting a can inside to be smashed [45].

44. Mechanized Can Crushing Apparatus, Patent Number: 7322285

A contraption for smashing articles incorporates a channel for serially encouraging items to the mechanical assembly and a driver roller that is rotatably determined about a first pivot by a power input instrument, wherein the driver roller has a first score. The contraption additionally incorporates an idler roller rotatably coupled to the driver roller in order to be rotatably determined about a second pivot that is significantly parallel to the primary hub. The idler roller has a second indent wherein the first and second scores facilitate to at any rate halfway get the protest in that all through a bit of individual unrests of the driver roller and the idler roller. The contraption may additionally incorporate a smashed protest outlet [46].

45. The Can Crusher, Patent Number: 0006160

The display creation identifies with a gadget that is fit for pressing paper and aluminum and steel jars. The machine is collected utilizing the accompanying parts: water powered jug jack, expansion springs, single-stage adapted engine, sliding contact component, and weight check. The information framework comprises of two noteworthy parts, the driving framework and the sliding contact system. The driving framework is an electric engine with a gearbox. This equipped engine is single-staged so it very well may be used in living arrangements and eateries. The sliding contact is isolated to three fundamental parts: the wrench, slider and lever. The pressure driven jack is a lifting gadget that utilizations fluid oil to raise substantial items, yet for this situation its goal is to squash the jars while being raised. The edge is separated into four fundamental parts: compartment, vertical casing, bring down plate and upper plate [47].

II. SUMMARY AND CONCLUSION

As an inventor for can crusher machine, we should scan all previous inventions in this area where it is a very hard work and time consuming. This study summarizes the inventions that introduced in the last two decades, from 2008 to 2018 (i.e., about one decades). The study is dedicated to present a brief summary of inventions, however, a detailed description of inventions might be presented in a separate study. A total of 45 patents were covered in the chosen time period. It is planned in the next papers to present the inventions for other time intervals.

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