Nov. 28, 1961 R. R. JOHNSON 3,010,662

WASTE RECEIVER AND DISPOSER FOR MOVING VEHICLE

Filed Feb. 15, 1960 2 Sheets-Sheet 1

FIG_1

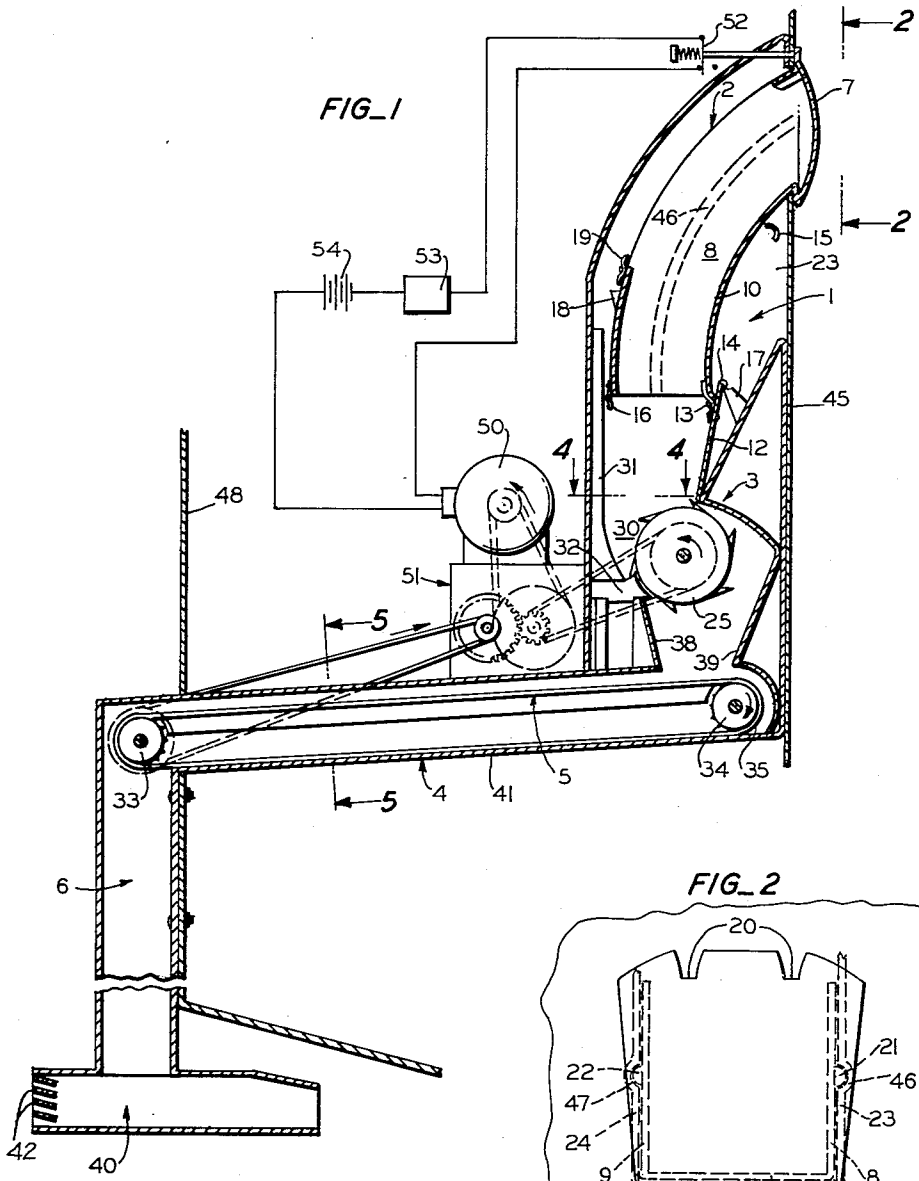


FIG_2

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FIG_3

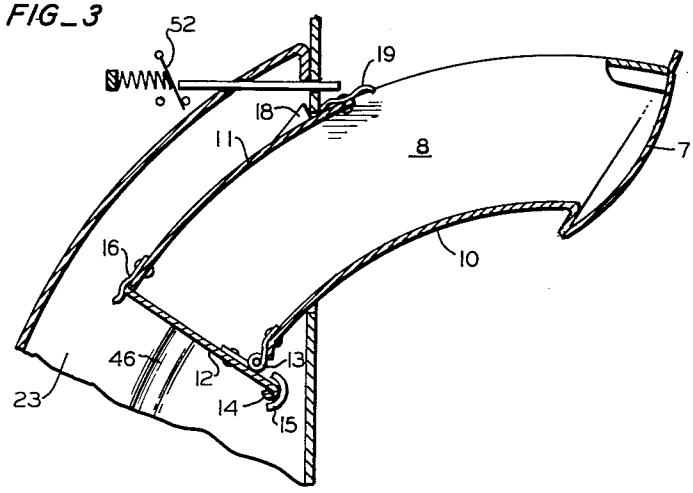
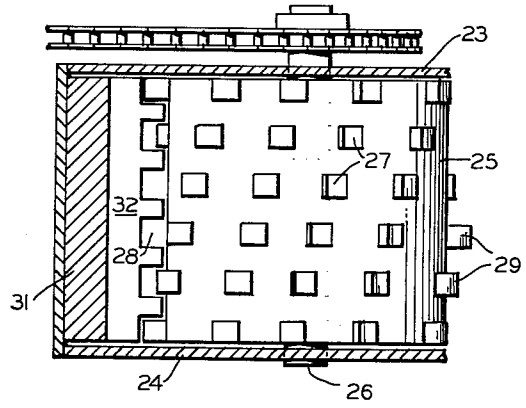


FIG_4



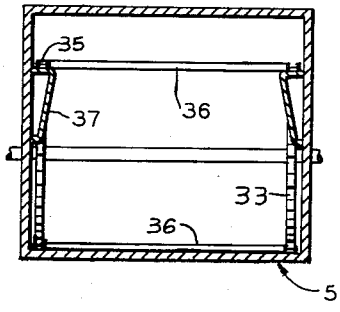


FIG_5

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WASTE RECEIVER AND DISPOSER FOR MOVING VEHICLE

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6 Claims. (Cl. 241—36)

This invention relates to apparatus for disposing of waste material as cigarettes, cigars, candy wrappers and the like from moving vehicles.

An important object of this invention is the provision of a vehicular accessory which can safely be used to dispose of lighted cigarettes and cigars.

Another object of this invention is a vehicular accessory which can disintegrate waste materials such as paper facial tissue, candy wrappers and cigarette packages into such small pieces that they can be released from a moving vehicle without objectionably littering the countryside.

Another object of this invention is the provision of waste disposing apparatus which helps prevent the formation of odors which are given off by stale cigar and cigarette stubs.

It is another object of this invention to provide apparatus for disposing of waste materials from a moving vehicle, which apparatus is automatic in operation and safely disposes of material that was once burning.

Other objects and advantages will become apparent from the description and drawings, in which;

FIG. 1 is a vertical sectional view of the apparatus of this invention in a preferred form incorporated in an automobile;

FIG. 2 is an enlarged elevational view as seen generally from line 2—2 of FIG. 1;

FIG. 3 is an enlarged, fragmentary vertical sectional view of the upper portion of the apparatus of FIG. 1, showing the waste material receiver in an open position;

FIG. 4 is an enlarged sectional view of the comminutor taken along line 4—4 of FIG. 1; and,

FIG. 5 is an enlarged cross sectional view of the conveyor taken along line 5—5 of FIG. 1.

This invention comprises (FIG. 1) a vertically extending enclosed chamber, generally designated 1, adapted to house a removable tray or waste materials receiver 2 and a comminutor, generally designated 4, housing a conveyor, generally designated 5; and a connected vertically disposed extension unit or discharge chute 6 having an escape housing or discharge means 40.

The enclosed vertical chamber 1 is adapted to fit on the back of an instrument panel 45 of a vehicle or similar facade with the tray 2 aligned with and projecting through a suitable opening in said panel in a manner similar to a conventional automobile ash tray.

The tray 2 has front end panel 7 which is adapted to be flush with the instrument panel when the tray is closed (FIG. 1). Attached to said end portion are two side members 8, 9 (FIG. 2), and a bottom member 10. At the end opposite panel 7, a top member 11 connects and spaces apart the side members 8, 9 and said top member extends approximately to the mid-point between the ends leaving the top of the tray, between said mid-point and panel 7 open for the insertion of cigarettes and the like. This provides tray or receiver 2 with an inlet end adjacent panel 7 which is adapted to open upwardly into the passenger compartment of the vehicle in which the same is mounted, and an outlet end remote from panel 7 which is adapted to open outwardly downwardly behind the instrument panel 45. The end panel 7 may have grooves 20 in the top thereof for holding lighted cigarettes.

The members 8, 9, 10, and 11 of receiver 2 are preferably shaped to an arcuate form and supported between the side walls 23, 24 or chamber 1 (FIG. 2). Projecting beads 21, 22 or side members 8, 9 are respectively received in corresponding arcuately extending recesses 46, 47 in walls 23, 24 for slidably supporting tray 2 for movement between a first position (FIG. 3) in which the inlet end is open into the vehicle passenger compartment and a second position (FIG. 1) in which panel 7 closes the tray opening in the instrument panel.

A stop 18 on the upper end of tray top member 11 prevents the tray from being pulled out an excessive distance. A spring catch 19 is provided at the upper end of member 11 near the mid-point between the tray ends to hold the tray in the extended or first position. Members 8, 9, 10, 11 may be integral with end 7.

The tray being mounted for arcuate sliding movement causes it to be disposed in a generally horizontal position when extended as shown in FIG. 3 and in a generally vertical position when closed as shown in FIG. 1.

A gate 12 is attached by hinge means 13 to the tray bottom 10 (FIG. 3) for closing the inner open end remote from panel 7. The gate has an extended end portion 14 which abuts with a stationary stop 15 when tray 2 is fully extended to the first position. As the tray is pulled through the last increment of outward travel stop 15 holds the end portion 14 but the hinge means 13 continues to move outwardly with the tray thereby swinging gate 12 to the closed position (FIG. 3).

Spring catch means 16 holds the gate 12 closed until the spring pressure of said catch is overcome by gate end 14 coming in contact with a stationary stop 17 (FIG. 1). Stop 17 is so located that when the tray 2 is moved into the closed or second position such movement causes gate end 14 to strike stop 17 and release the gate 12 from spring means 16 to open the inner, lower end of receiver 2.

In this position the lower, outlet end of receiver 2 opens outwardly downwardly to discharge its contents into the comminutor 3. Said comminutor comprises a cutting wheel or drum 25 (FIGS. 1, 4) having teeth 27 projecting from the periphery thereof and meshing with a fixed anvil or cutter bar 32. Said teeth are arranged in circumferential rows 29, each row having a plurality of teeth equally spaced around the periphery of drum 25 and each row is circumferentially offset from an adjacent row by an amount less than the teeth spacing.

At the bottom of throat 30, formed by back plate 31 and the drum 25, is a cutter bar 32 which has recessed slots 28 aligned with the cutter teeth 27 which travel therein, said slots 28 being of sufficient width and depth to provide a preferred clearance of 1/64 inch between the teeth and the cutter bar slots 28 and between the drum 25 and the cutter bar 32.

As the drum rotates the above described arrangement of teeth causes teeth passing cutter bar 32 at any one given time to be circumferentially displaced which greatly facilitates the steady movement of waste material through the comminutor. Said movement of waste matter is further facilitated by the employment of wedge-shaped teeth with the apex a thereof projecting forward in the direction of drum rotation, as best seen in FIG. 1.

Rectangular opposed members 38, 39 are located downwardly from the comminutor 3 and inclined inwardly at their lower ends, providing a deflecting surface for the torn materials which are funneled downwardly to the conveyor floor 41.

A conveyor 5 is provided in the horizontal chamber 4 to transfer the torn materials horizontally forward past the fire wall 43, one end of said conveyor being directly below the comminutor 3 and the other end thereof extends past the fire wall 43 into the vertically disposed

extension unit or discharge chute 6. The conveyor is comprised of drive sprockets 33 located at the end forward the fire wall and idler sprockets 34 located at the end below the comminutor with chains 35 running thereon, said chains are connected at regularly spaced intervals by elongated slats 36 (FIG. 5) which carry the waste matter along the conveyor floor 41 as said slats move from sprocket 34 to sprocket 33. Supporting members 37 are elongated strips fastened opposedly to the inner sides of the conveyor chamber 5 and support the chain and slats during passage between the drive sprocket 33 and the idler sprocket 34.

Extending below sprocket 33 is an extension unit 6 which comprises an elongated, enclosed, vertically disposed chamber leading to an escape housing 40 which is located in the wind stream when the vehicle is in motion.

The escape housing is an open-ended boxlike structure disposed with its open ends facing the front and rear of the vehicle, fastened at its top to the extension unit 6 and open at its top to permit refuse to fall through the extension unit and onto the bottom of said escape housing where such refuse will be carried away by the wind stream. At the forward open end of the escape housing, vanes 42 are provided to deflect the air onto the bottom of the housing.

A conventional motor 50 is employed to drive the comminutor 3 and the conveyor chain 35. Standard gear reduction means 51 are utilized to obtain proper drum 25 and conveyor 5 speeds. In practice the apparatus of this invention has been found to work most satisfactorily with a drum 25 one and one-half inches in diameter turning at 100 revolutions per minute. The preferable conveyor speed is obtained by using a drive sprocket 33 which is eleven-sixteenths of an inch in diameter and driving it twenty-five revolutions per minute.

A conventional switch 52 (FIG. 1) is employed in conjunction with the tray end 7 so as to supply current from the storage battery 54 to the motor 50 when the tray is closed. A conventional timer 53 is incorporated into the circuit to turn off the motor 50 after it has run a predetermined time. The timer reset mechanism incorporated into the timer 53 normaly operates to reset the timer when the tray 2 is opened with resulting opening of the contacts in switch 52, but a time delay is provided in the reset mechanism to prevent the same from being reset within some desired interval, such as 15 minutes, from when the timer interrupted the circuit. Using a conveyor chain speed as before described, ten seconds is the proper duration that the motor should run in each interval.

Operation of this invention is accomplished in much the same manner as one would use an ordinary ash tray. When the tray 2 is to be used, it is manually opened to its fully extended position as shown in FIG. 3. As the tray is extended the last fraction of an inch the resistance of stationary stop 15 against the up-moving gate end 14 causes the gate 12 to close, the latter then being held in said closed position by spring member 16.

The open tray 2 can be used for depositing ashes or other material and grooves 20 can be used to hold lighted cigarettes.

After the waste material has been deposited in the tray it is pushed inwardly so that the end panel 7 is flush with the surrounding instrument panel 45. As the tray nears the closed position gate end 14 strikes fixed stop 17 causing the gate 12 to lower and release the contents of the tray, such contents falling into throat 30. Simultaneously with said gate opening, tray end 7 presses against a conventional electrical switch (52) which causes the motor 50 to start, which in turn rotates the drum 25. The motor continues to operate for an interval, preferably 10 seconds until its circuit is interrupted by the timer 53, during which time all the waste matter is drawn between the drum 25 and the cutter bar 32. The clearance between said drum and the cutter bar being relatively small causes the waste material to be torn into many small bits as it is drawn between the bar 32 and the wheel 25. These torn bits are then deflected downwardly by inclined members 38 and 39 to the conveyor floor 41 where they can be transported by slats 36.

A conveyor means 5 is utilized to transport the waste bits in a horizontal plane. The speed of the conveyor chain 35 is such that during each interval of motor operation the chain will move less than the length of the conveyor, but more than half the length thereof. This timing of the motor 50 in relation to the traversed distance of the conveyor chain 35 provides an important safety factor in that any possible sparks or smoldering tobacco remaining after the multilating effect caused by the comminutor 3 will die out as it rests on the conveyor floor 41 before being deposited into the escape housing 40. In addition, use of a solid webbed belt in place of a slatted conveyor chain 35 will help to smother the waste material between such belt and floor 41. Waste material that has been cut into minute particles during one period of operation will lie on the conveyor floor 41 until such time as the tray is again opened and closed, but in no case less than 15 minutes. This delayed disposal is an absolute check on the possibility that any burning material may be deposited where it might create a fire harzard.

Located below and connected to the conveyor end opposite to idler wheel 34 is a vertically disposed extension unit 6 which provides a chamber wherein the rubbish may fall downwardly to the escape housing 40.

The escape housing serves as a collection unit for any waste that may pass through vertical extension unit 6 while the vehicle is parked. This prevents littering the garage or other parking areas. When the car is in motion any matter on the bottom of said escape housing or falling thereon will be carried away by the wind passing through the open ends in the front and rear of said housing.

In summary, the simple operation of this apparatus entails the closing of the tray 2 which starts the motor and opens the tray gate allowing the contents of the tray to fall into the comminutor which cuts such contents into very small pieces. The conveyor moves the cut pieces along a conveyor but will not reach the end thereof before the timer stops the motor. When the tray is again opened and closed the previously cut bits of waste will be carried to the end of the conveyor and dropped, via an extension unit, into an escape housing where the wind stream caused by vehicle movement will disperse the cut fragments.

Although it has been described and illustrated in detail, the invention is to be construed as broadly as the spirit and scope of the appended claims permits.

I claim:

1. Apparatus for disposing of waste materials from a moving vehicle, comprising: a waste material receiver mounted in a vehicle and having an inlet end adapted to open into the passenger compartment of the vehicle and an outlet end adapted to open outwardly downwardly, a comminutor supported at said outlet end for receiving and comminuting waste material from said receiver, a generally horizontally extending conveyor supported to receive comminuted waste material from said comminutor and having discharge means opening outwardly of the vehicle, and intermittently operable motor means connected to said conveyor for driving the same a distance less than its length for each operation of said motor means.

2. Apparatus for disposing of waste materials from a moving vehicle, comprising: a waste material receiver mounted in a vehicle and having an inlet end adapted to open into the passenger compartment of the vehicle and an outlet end adapted to open outwardly downwardly, a comminutor supported at said outlet end for receiving and comminuting waste material from said receiver, a

generally horizontally extending conveyor supported to receive comminuted waste material from said comminutor and having a discharge end opening outwardly of the vehicle, and intermittently operable motor means connected to said conveyor for driving the same a distance less than its length for each operation of said motor means, said receiver being supported for movement between a first position in which said inlet end opens into the passenger compartment and a second position in which said inlet end is closed and said outlet end is open outwardly downwardly, and switch means operable by said receiver in moving to said second position and connected to said motor means for initiating operation thereof.

3. Vehicle waste disposing apparatus, comprising: a waste material receiver supported in a vehicle for movement between a first position opening into the passenger compartment of the vehicle and a second, closed position, said receiver opening outwardly downwardly at its end behind the vehicle instrument panel, a comminutor supported below said receiver for receiving waste material therefrom and for reducing the same to small particles, a generally horizontal conveyor extending from beneath said comminutor to a point forwardly of the firewall of the vehicle for receiving waste material from said comminutor and conveying the same, an intermittently operable motor for driving said conveyor a distance less than its length for each operation of said motor, and a discharge chute at the end of said conveyor, remote from said comminutor opening outwardly downwardly of the vehicle for discharging the waste material from said conveyor during successive operations of said motor.

4. Vehicle waste disposing apparatus, comprising: a waste material receiver supported in a vehicle for movement between a first position opening into the passenger compartment of the vehicle and a second, closed position, said receiver opening outwardly downwardly at its end behind the vehicle instrument panel, a gate swingably supported at said end of said receiver closing the same, means operable for opening said gate when said receiver is in said second position and for closing said gate when said receiver is in said first position, a comminutor supported below said receiver for receiving waste material therefrom and for reducing the same to small particles, a generally horizontal conveyor extending from beneath said comminutor to a point forwardly of the firewall of the vehicle for receiving waste material from said comminutor and conveying the same, an intermittently operable motor for driving said conveyor a distance less than its length for each operation of said motor, and a discharge chute at the end of said conveyor, remote from said comminutor opening outwardly downwardly of the vehicle for discharging the waste material from said conveyor during successive operations of said motor.

5. Vehicle waste disposing apparatus, comprising: a waste material receiver supported in a vehicle for movement between a first position opening into the passenger compartment of the vehicle and a second, closed position, said receiver opening outwardly downwardly at its end behind the vehicle instrument panel, a comminutor supported below said receiver for receiving waste material therefrom and for reducing the same to small particles, a generally horizontal conveyor extending from beneath said comminutor to a point forwardly of the firewall of the vehicle for receiving waste material from said comminutor and conveying the same, an intermittently operable motor for driving said conveyor a distance less than its length for each operation of said motor, and a discharge chute at the end of said conveyor, remote from said comminutor opening outwardly downwardly of the vehicle for discharging the waste material from said conveyor during successive operations of said motor, and central means for said motor including a switch in the motor circuit operable by moving said receiver to said second position for starting said motor and time delay interrupting means in the motor circuit for stopping said motor after travel of said conveyor said distance.

6. Vehicle waste disposing apparatus, comprising: a waste material receiver supported in a vehicle for movement between a first position opening into the passenger compartment of the vehicle and a second, closed position, said receiver opening outwardly downwardly at its end behind the vehicle instrument panel, a comminutor supported below said receiver for receiving waste material therefrom and for reducing the same to small particles, a generally horizontal conveyor extending from beneath said comminutor to a point forwardly of the firewall of the vehicle for receiving waste material from said comminutor and conveying the same, an intermittently operable motor for driving said conveyor a distance less than its length for each operation of said motor, and a discharge chute at the end of said conveyor, remote from said comminutor opening outwardly downwardly of the vehicle for discharging the waste material from said conveyor during successive operations of said motor, said conveyor including upper and lower runs and a stationary floor member supported below and adjacent said lower run for receiving said waste material on said floor member for movement therealong by movement of said lower run.

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