March 6, 1956 S. G. CRAIG 2,737,350

COMBINED ASH RECEIVER AND POWER OPERATED CIGAR AND CIGARETTE BUTT PULVERIZER AND EXTINGUISHER

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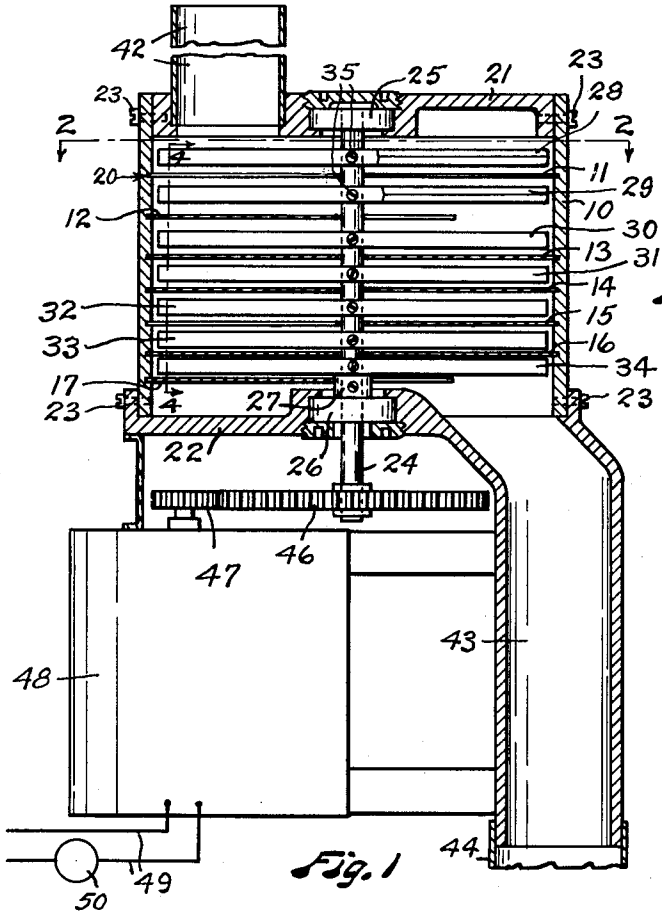


Fig. 1

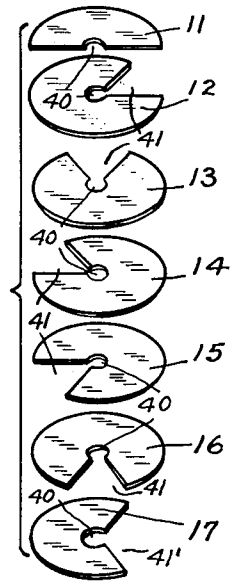


Fig. 3

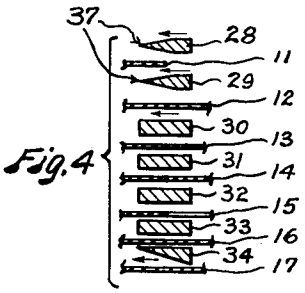


Fig. 4

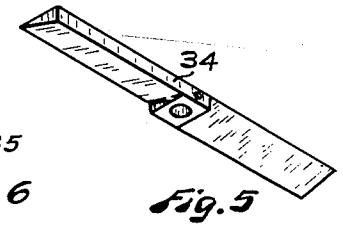


Fig. 5

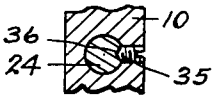


Fig. 6

Fig. 2

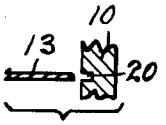


Fig. 7

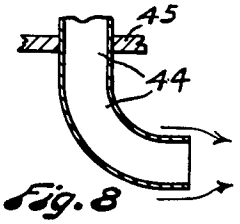


Fig. 8

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COMBINED ASH RECEIVER AND POWER OPERATED CIGAR AND CIGARETTE BUTT PULVERIZER AND EXTINGUISHER

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5 Claims. (Cl. 241—154)

This invention relates to a combined ash receiver and power operated cigar and cigarette butt pulverizer and extinguisher for use in a passenger compartment of a motor vehicle.

The butts or stubs of cigars and cigarettes, when left in the ash trays of automobiles or similar closed passenger compartments of motor vehicles, are particularly objectionable due to their strong and unpleasant odor. Also these butts are liable to be placed in the ash trays in a burning condition so that they continue to smoke and smoulder and constitute a fire hazard.

An object of this invention is to provide means for finely pulverizing and completely extinguishing all of the fire in these cigar and cigarette butts and disposing of the same at the time they are discarded thus eliminating danger of fire and removing the source of the objectionable odor which arises if they are allowed to smoulder or lie in ash trays.

A further object is to minimize fire danger due to the presence of lighted cigar and cigarette butts in the ash trays of motor vehicles by making it possible to finely pulverize and disintegrate and dispose of these cigar and cigarette butts as soon as they are placed in the ash receptacles.

Another object is to provide a cigar and cigarette butt pulverizer device which will pulverize the said butts or stubs finely and which will push and drag and pummel the pulverized or partly pulverized matter sufficiently to insure that all live fire and sparks have been completely extinguished and that the discharging pulverized matter is incapable of starting fires.

Another object is to provide a cigar and cigarette butt pulverizing device which will create a suction tending to draw air and smoke and odors out of the motor vehicle passenger compartment in which it is used.

Other objects of this invention are to provide a device of this nature which is simple in construction, reliable and efficient in operation and not expensive to manufacture.

Other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings.

In the drawings:

Figure 1 is a view in vertical section taken substantially on broken line 1—1 of Fig. 2 and showing a cigar and cigarette butt pulverizing and extinguishing device constructed in accordance with this invention, parts being shown in elevation and parts being broken away.

Fig. 2 is a view in cross section of the same taken substantially on broken line 2—2 of Fig. 1, parts being shown in plan and parts being shown in a different position than they are in Fig. 1.

Fig. 3 is a somewhat diagrammatic exploded perspective view, on a smaller scale than Figs. 1 and 2, showing a series of non-rotatable pulverizer plates embodied in this device.

Fig. 4 is a fragmentary sectional view taken substantially on broken line 4—4 of Fig. 1 showing pulverizer plates and pulverizer bars.

Fig. 5 is a detached perspective view of a rotary suction creating pulverizer bar.

Fig. 6 is a detached fragmentary sectional view showing means for attaching a pulverizer bar to a shaft.

Fig. 7 is an exploded sectional view showing fragments of a housing and pulverizer plate.

Fig. 8 is a fragmentary sectional view showing the outlet end portion of a discharge conduit for pulverized matter.

Like reference numerals designate like parts throughout the several views.

This device comprises a cylindrical housing 10 having therein a plurality of spaced apart fixed transverse pulverizer plates 11 to 17 inclusive. To facilitate assembly the housing 10 may be formed of two semi-cylindrical parts having outwardly extending flanges 18 along their edges which are secured together by bolts or screws 19. The spaced apart pulverizer plates 11 to 17 inclusive preferably are formed of thin but stiff and durable sheet metal and the peripheral portions of these plates 11 to 17 inclusive are herein shown as seated in suitable annular grooves 20, Fig. 7, in the inner wall of the housing 10. The plates 11 to 17 inclusive are fixed and immovable within the housing and the distance between successive contiguous plates decreases in a downward direction in the housing 10, the uppermost plates being farther apart than the lowermost plates are.

The housing 10 is provided with a top end member 21 and a bottom end member 22, both rigidly attached to the housing 10 as by screws 23. A shaft 24 extends axially through the housing 10 and is journaled in two bearings 25 and 26 in the top end member 21 and bottom end member 22 respectively. The shaft 24 may have a collar 27 rigidly secured thereto just above the lower bearing 26 and the bearing 26 may function as a combined thrust and radial bearing.

A plurality of rotatable pulverizer bars 28 to 34 inclusive are secured to the shaft 24 in spaced apart relation and operate between and in close proximity to the several pulverizer plates 11 to 17 inclusive. Screws 35, see Fig. 6, seating in depressions 36 in the shaft 24 may be used to secure the bars 28 to 34 inclusive to the shaft 24. Preferably the two uppermost pulverizer bars 28 and 29 have the edges thereof, which are foremost as said bars rotate, sharpened as shown in Fig. 4 to provide cutting edges 37 on each half of said bars, see also Fig. 2. These cutting edges 37 will cut up the incoming material into small pieces and the pieces will be pulverized by the successive bars 29 to 34 in cooperation with the successive plates 11 to 17. Preferably at least one of the bars, such as the lowermost bar 34 is beveled on its lower side, as shown in Figs. 4 and 5, so that when it is rotated in the direction indicated by the arrows it will act like a fan blade to create a downward flow of air through the housing 10. This will tend to draw out smoke and foul air from the passenger compartment in which this device is located and thus will provide better ventilation. Obviously the number of plates and the number of rotating bars in this device may be varied. Also the number of bars having sharpened edges may be varied and the number of bars which are pitched to provide flow through housing 10 may be varied.

The pulverizer bars 28 to 34 inclusive do not contact the pulverizer plates 11 to 17 inclusive but move freely in close proximity to said plates. The distance between successive pulverizer plates 11 to 17 inclusive is gradually reduced to provide for decreasing clearance between the pulverizer plates and the pulverizer bars from the upper toward the lower end of the housing.

Each pulverizer plate 11 to 17 inclusive has a centrally positioned recess 40 to provide clearance for the

shaft 24. Preferably the uppermost plate 11 is semi-circular in shape. Each plate 12 to 16 inclusive is provided with a V-shaped notch 41 extending from the periphery of the plate toward the center thereof and formed by removing a section of the plate about sixty degrees in extent. The lowermost plate 17, being the plate over which the pulverized material discharges preferably has a section more than sixty degrees in extent removed therefrom to provide a notch 41' which allows a free discharge of pulverized material. The removal of sectors of metal from the plates 11 to 17 inclusive leaves these plates with radially extending edges which cooperate with the rotating bars in cutting up and pulverizing downwardly moving material.

An inlet tube 42 for ashes, cigar and cigarette stubs or butts, burned matches and the like is connected with the top end member 21 and communicates with the interior of the housing 10. This inlet tube 42, which is shown partly broken away in Fig. 1, may be of any desired shape and may have its top end portion positioned at any suitable location where it is convenient to place discarded cigar and cigarette butts, burned matches, ashes and the like in it.

The bottom end member 22 has a suitable outlet conduit 43 which communicates with a discharge pipe 44. Preferably the discharge pipe 44, see Fig. 8, extends down through the floor 45 of the passenger compartment of a motor vehicle in which this device is installed and curves toward the rear of the vehicle. When the vehicle is moving forwardly air which is moving past the end of the discharge pipe 43 in the direction indicated by arrows will tend to create a suction through the pipe 43 and conduit 42 and housing 10. This suction will tend to remove ashes and pulverized material from the device and will further tend to withdraw smoke and foul air from the passenger compartment in which the device is located.

The shaft 24 is connected by speed reduction gears 46 and 47 with an electric motor 48. Electric current for operating the motor 48 is supplied through conductors 49. A time delay relay 50 is provided in the circuit which includes conductors 49. The time delay relay 50 is a well known and readily obtainable device which, after the motor circuit has been momentarily energized, as by the closing of a self opening switch, will maintain said motor circuit closed for a predetermined period of time and will then break said motor circuit and stop the motor. This insures operation of the motor for the correct period of time each time it is energized.

The inlet tube 42 communicates with the housing 10 at a location as indicated by dot and dash lines 42' in Fig. 2 so that the incoming material is dropped on the second pulverizer plate 12 adjacent an edge of the semi-circular top pulverizer plate 11. The two top pulverizer bars 28 and 29, moving clockwise as respects the showing in Fig. 2, force the incoming material against the edge of the plate 11 and cut it into pieces. This cut up material is pushed around on the plate 12 by the bar 29 until it reaches the notch 41 in said plate 12 and then drops down onto the plate 13 where it is contacted by the bar 30 and is pushed and dragged around on the plate 13 until it drops through the notch in said plate 13 onto the plate 14. The notches 41 are preferably relatively positioned and offset so that the material is pushed and dragged around for a distance of approximately three hundred degrees on each pulverizer plate except the top plate 11 and bottom plate 17 before it drops onto the next plate. This thoroughly pummels and breaks up and pulverizes the material and extinguishes all of the fire and sparks in the same before the material finally drops off of the lowermost plate 17 into the discharge conduit 43. The pulverizer bars continuously shear past the edges of the pulverizer plates and thus insure the cutting and breaking up of all solid matter before it reaches the conduit 43.

The foregoing description and accompanying drawings clearly disclosed a preferred embodiment of my invention but it will be understood that this disclosure is merely illustrative and that changes may be made within the scope and spirit of the following claims.

I claim:

1. A combined ash receiver and power operated cigar and cigarette butt extinguisher and pulverizer comprising an upright cylindrical housing; a plurality of horizontal spaced apart parallel pulverizer plates fixedly mounted in said housing at least some of said plates having V-shaped notches extending from the periphery to the center thereof with the notches in successive plates progressively offset, whereby material will drop on the plates and may be moved over substantially the entire surface of each plate before reaching the notch therein; an axial shaft rotatively mounted in said housing; power operated shaft driving means connected with said shaft; a plurality of pulverizer bars positioned between said plates and secured to said shaft in spaced apart relation crosswise of the shaft; whereby rotation of said shaft will rotatively move said bars between said plates; an inlet conduit for cigar and cigarette butts connected with the upper end portion of said housing; and an outlet conduit for pulverized material connected with the lower end portion of said housing.

2. The apparatus as claimed in claim 1 in which at least the uppermost pulverizer bar is provided with sharp forward edges to initially contact and cut up the incoming cigar and cigarette butts.

3. The apparatus as claimed in claim 1 in which at least one of said pulverizer bars is provided with pitched suction creating blade surfaces providing a suction downwardly through said housing and withdrawing smoke and foul air from the passenger compartment when the bars are rotated.

4. A combined ash receiver and power operated cigar and cigarette butt extinguisher and pulverizer, comprising an upright cylindrical housing; a plurality of horizontal spaced apart parallel pulverizing plates fixedly mounted in said housing, the uppermost plate being substantially semi-circular in shape and the plates below said uppermost plate having V-shaped notches extending from the periphery toward the center of the plates, the V-shaped notch of each succeeding plate being angularly offset relative to the V-shaped notch of the plate above it, whereby material dropping from one plate will fall on the next plate below at a point removed from the notch in said next plate below; an upright shaft rotatively supported axially of said housing; power operated shaft driving means connected with said shaft; a plurality of pulverizer bars positioned between said pulverizer plates and secured to said shaft in spaced apart relation crosswise of the shaft, whereby rotation of said shaft will rotatively move said pulverizer bars between said plates and will move material over said plates to the notches in said plates; an inlet conduit connected with the upper end portion of said housing; and an outlet conduit connected with the lower end portion of said housing.

5. The apparatus as claimed in claim 4 in which the plates are positioned at successively decreasing distances apart from top to bottom of the housing.

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