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SANDING DEVICE

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This invention relates generally to the class of sanding devices and is directed particularly to a new and novel device designed primarily for use by motorists, but not necessarily restricted to such use, as it is adaptable to use in association with any wheeled vehicle where the application of sand to a road surface or track surface may be desired.

The use of sand on slippery road surfaces, as on icy surfaces, is general in commercial vehicles and public utility vehicles and in such vehicles provision is frequently made for carrying the sand in a permanently installed receptacle from which it may be discharged as desired onto the pavement surface in advance of the driving wheels. Private passenger vehicle operators do not have in their vehicles the advantage of installed apparatus for sanding the road or pavement surface, and accordingly it is a common practice for the owners or operators of such private vehicles to carry a bag or box of sand in the trunk compartment for use when needed. This arrangement requires that when the sand is to be used, the vehicle operator or someone else must shovel out the sand from the container onto the road surface and if only one person is available to do this and to operate the vehicle, then, of course, such person must allow the vehicle to stand while the sand is placed on the pavement surface and in order for the sanding to be effective, it has to be shoveled in close under the wheels so that when the vehicle is started, some gripping action will be obtained.

A particular object of the present invention, in view of the foregoing, is to provide a device or apparatus designed so that it can be used on a private passenger vehicle in such a way that sand can be discharged or dispensed onto the road or pavement surface immediately in advance of the driving wheels while the vehicle is in operation or while the wheels are rotating, thus making it possible for the vehicle operator to dispense the sand onto the pavement surface without having to leave the vehicle.

Another object of the invention is to provide a sand dispenser which can be mounted in operative position on a private passenger vehicle for use and which, when not desired for use, can be dismounted and stored in the vehicle trunk compartment or somewhere within the vehicle until again needed for use.

Still another object of the invention is to provide a sand dispensing device designed to be suspended on a vehicle body in a position where sand can be dispensed onto the pavement surface in the manner above stated and wherein the discharge of the sand from the device can be regulated or controlled by an occupant of the vehicle while the latter is operating, or while the driving wheels are rotating.

A still further object of the invention is to provide a device of the above described character wherein an electrically operated control valve forms a part for opening and closing an outlet of a receptacle and wherein said electrically controlled valve may be connected with and conveniently operated from the conventional socket form-

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ing a part of the vehicle instrument board mechanism and employed for heating a cigarette lighter.

The invention broadly contemplates the provision of a receptacle in the form of a flexible bag having a means connected therewith for suspending the bag on a side of a motor vehicle body, as for example, from the sill of the window of a rear door, and such bag having connected with a bottom opening a flexible tube which may be placed in proper position and secured, for the discharge of sand from the receptacle downwardly onto the underlying pavement immediately in front of a rear or driving wheel.

Associated with the receptacle and located within the same is a valve mechanism controlled by an electric solenoid with which solenoid are connected electric current conductors leading to a plug adapted to be inserted in the cigarette lighter socket. A switch in the wires provides a means for energizing the solenoid to effect the opening of the valve.

Means is also provided upon the sand conducting pipe or tube for securing the latter at its lower or outlet end in operative position, such means being preferably in the form of a strong permanent magnet attached to the tube and by which the tube can be held tightly against a part of the metal body or framework of the vehicle.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawing forming part of the specification, with the understanding, however, that the invention is not confined to a strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Fig. 1 is a view in side elevation of a portion of a conventionally illustrated motor vehicle showing a sander constructed in accordance with the present invention mounted on one side thereof and a portion of the structure being broken away to show electrical connection between the device and the cigarette lighter;

Fig. 2 is a view in perspective of the sander device with a portion of the bag broken away to show the magnetically actuated valve;

Fig. 3 is a vertical sectional view through the magnetically actuated valve and a portion of the sand bag or receptacle showing one manner of connecting the valve and receptacle together;

Fig. 4 is a diagram of a circuit in which two of the magnetic valves are connected.

Referring now more particularly to the drawing, the numeral 10 generally designates a motor vehicle, the forward portion of the same being broken away. Numerals 12 and 14 designate respectively the front and rear doors on one side of the vehicle while one rear wheel is shown and designated 16.

The vehicle instrument panel or dash is designated 18 and the numeral 20 designates the cigarette lighter socket with which electrical connection is made by the conductors hereinafter referred to, for transmitting valve operating current to the solenoids of the electrically actuated valves of a pair of the sanding devices.

While in the preceding paragraphs reference has been made to the use of the present sander upon a private passenger vehicle, it will, of course, be understood that there is no intention to limit the use of the device to such a vehicle as it may be used on buses, trucks or delivery vehicles where the same may not have the built-in equipment for sanding the roadway.

It will also be understood that while only one of the devices is shown in use on the vehicle, the devices are intended to be used in pairs mounted on opposite sides

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of the vehicle, either on the rear doors, as shown in Fig. 1, where four door sedans or the like may be in use, or, in the two door type of body, the sanding receptacles would be mounted upon the front doors or suspended from any other part of the vehicle which may be available for such use.

The improved sander of the present invention embodies a suitable receptacle such as that generally designated 21. This receptacle may be in the form of a cloth or plastic bag or sack having a top opening 22 provided with a suitable closure means such as a conventional slide fastener of the type wherein a series of intersecting teeth are disposed along opposite edges of the bag opening or mouth and are designed to be brought into interlocking engagement to close the bag mouth or separate it for opening the same. This type of slide fastener which is here designated 23 is of well known construction and accordingly a further description of the same is not deemed necessary to an understanding of its use in the present case.

While the cloth or plastic receptacle or some other type of flexible readily foldable receptacle is preferred, it will also be understood that the receptacle may be of metal or stiff plastic, if desired, in which case any other suitable means would be employed for closing the top thereof so that the receptacle could be stored in the vehicle trunk compartment filled with sand and ready for use.

To facilitate suspending the receptacle from the sill of a car window in the manner illustrated, or from any other suitable part of the car or vehicle, the receptacle may have attached thereto a hook 24. In the present case the hook is shown as hingedly secured to a side of the receptacle by a sewed-on patch 25 but use might be made of a riveted metal clip or any other means for attaching the hook to the receptacle.

The receptacle is shown as tapering to the lower or bottom part thereof as indicated at 26 and in the central part of the tapered bottom 26 an opening 27 is provided for the extension therethrough of a part of the magnetically actuated feeder valve about to be described.

The electromagnetically operated valve is generally designated 28 and as here shown comprises an upright frame or spider having a top circular portion 29 and a lower substantially frusto-conical portion 30. This lower portion has the narrower or tapered end directed downwardly and the wall thereof is provided with openings 31 for the passage of sand into the middle part of the lower portion to the sand outlet.

The tapered lower part of the frame portion 30 is joined to a circular plate 32 and this plate in turn is formed integrally with a downwardly extending nipple 33 and the passage 34 of which opens at its top end through the plate 32 and is slightly enlarged to provide an annular shoulder 35 which forms a valve seat.

Externally the nipple 33 is screw threaded as indicated at 36 and when the nipple is extended downwardly through the bag opening 27, this screw threaded portion has engaged therewith below or on the underside of the bag bottom, a securing nut 37 which is drawn up against a washer or gasket 38 encircling the nipple and interposed between the nut and the bottom of the bag. Thus the bottom portion of the bag around the opening 27 will be firmly clamped between the plate 32 and the nut retained washer 38 so that the electromagnetically operated valve unit will be maintained in upright position within the bag when the latter is suspended for use.

The annular part 29 of the frame has fitted therein and is secured to, an upright electromagnet coil 39 having an axial passage 40 which is axially aligned with the nipple 33. Within the passage 40 of the coil is slidably positioned the armature 41 which functions as a valve element and which, when the coil is deenergized, drops down into the lower part of the frame 30 to enter the

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upper end of the nipple and rest or seat itself upon the seat 35.

Operatively connected with the lower end of the nipple 33 is a tube or conduit 42 which preferably is of flexible material so that it can be readily bent or curved into a desired operative position. Any suitable means may be employed for attaching an end of the tube 42 to the nipple 33, the means here illustrated comprising a collar 43 which is secured to the end of the tube and which has a pair of bayonet slots 44 therein one only of which is illustrated, the collar having a suitable inside diameter to snugly receive the lower end of the nipple and the nipple carrying a pair of pins 45 for engagement in the bayonet slots 44 when the collar is slipped on the nipple.

This slot and pin coupling illustrated between the tube and the outlet for the bag provides a quick means of attaching the tube or detaching it, but it is to be understood that any other suitable means may be used if desired.

The tube 42 has secured in a suitable manner on the outer surface thereof adjacent to the lower end, a means for fixing the lower end of the tube in a desired position with respect to the vehicle wheel, such means being here shown as a permanent magnet 46. By the provision of this magnet, when the bag is in position on the vehicle body, the lower end of the tube can be fixed to the body in the manner illustrated in Fig. 1, the magnet, of course, attaching itself to an adjacent metal part of the vehicle body.

As hereinbefore stated, the sanding device is intended to be used in pairs and Fig. 4 illustrates a simple electric circuit diagram showing the connections of two magnet coils with conductors leading to a plug formed for insertion into the cigarette lighter socket 20 on the vehicle instrument panel. As shown in this diagram, the two coils 39 are connected in parallel to conductors 47 and 48 which terminate at contacts 49 and 50 respectively in a plug body 51. This plug body, as previously stated, is suitably formed to be received in the cigarette lighter socket 20 and one of the conductors is provided with a suitable switch 52 by means of which the circuits to the coils may be established or broken, as desired.

While the circuit diagram forming Fig. 4 shows the coils of two sander units connected together, it will be, of course, understood that if desired, the sander devices may be provided with a single pair of conductors rather than having two devices electrically connected together so that one of the sander devices only may be used on one side of the car, if desired.

From the foregoing, it is believed that the manner of using the present invention will be apparent. As previously stated, the receptacles may be carried filled at all times with sand so as to be ready for use and to be put into use it is only necessary for one or two of the receptacles to be hung on the car in a suitable manner and at a good elevation above the rear wheels and the lower ends of the tubes 42 secured by the magnets 46 in the proper position to discharge the sand by gravity onto the underlying pavement beneath the front of the vehicle driving wheels. When the plug 51 is then inserted into the cigarette lighter socket, the driver of the vehicle or a passenger can readily effect the discharge of sand by closing the switch which will energize the coils 39 and lift the armature valve 41 from its seat, permitting the sand to flow in through the apertured lower part of the magnet supporting frame and down through the tube. On deenergization of the magnet coils, the armature valve will drop back by gravity on its seat to shut off the flow of sand, such downward movement being assisted to a certain extent by the movement of the sand downwardly through the nipple.

I claim:

1. A sanding device comprising a flexible receptacle, means secured to said receptacle for hanging the receptacle from a portion of a vehicle, said flexible receptacle

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having a central opening formed in the bottom portion thereof, a frame member including an upper portion and a lower substantially frusto-conical tapered portion, a laterally extending plate portion formed integral with the lower part of said tapered portion, a downwardly extending nipple formed integral with said plate and having threads formed on the outer surface thereof, said nipple extending through the opening in the lower part of said flexible receptacle, a portion of said frame member comprising a valve seat, means threaded on the exterior of said nipple for clamping the portion of the bag surrounding the opening therein against the under surface of said plate portion for supporting the frame at the bottom portion of the receptacle, a solenoid coil supported by the upper portion of said frame, said solenoid coil including a central bore therein, an armature slidably mounted in said bore, said armature having a lower end portion normally received within said valve seat whereby the armature serves as a valve member, said frame including openings formed therethrough adjacent said valve seat for permitting sand to flow therethrough, said nipple having a central bore formed therethrough said opening at said valve seat for conducting sand outwardly from

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the receptacle, and a flexible sand distributing tube connected to said nipple for conducting sand away from the receptacle.

2. Apparatus as defined in claim 1, wherein the bore of the solenoid coil, the armature and the opening in the nipple as well as the valve seat are in axial alignment with one another, the axis of these elements being disposed in an upright position such that the armature is normally urged into sealing engagement with the valve seat by the force of gravity.

3. Apparatus as defined in claim 1, including magnetic means secured to the flexible sand distributing tube for securing the tube to the external surface of a vehicle.

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