

Oct. 14, 1958

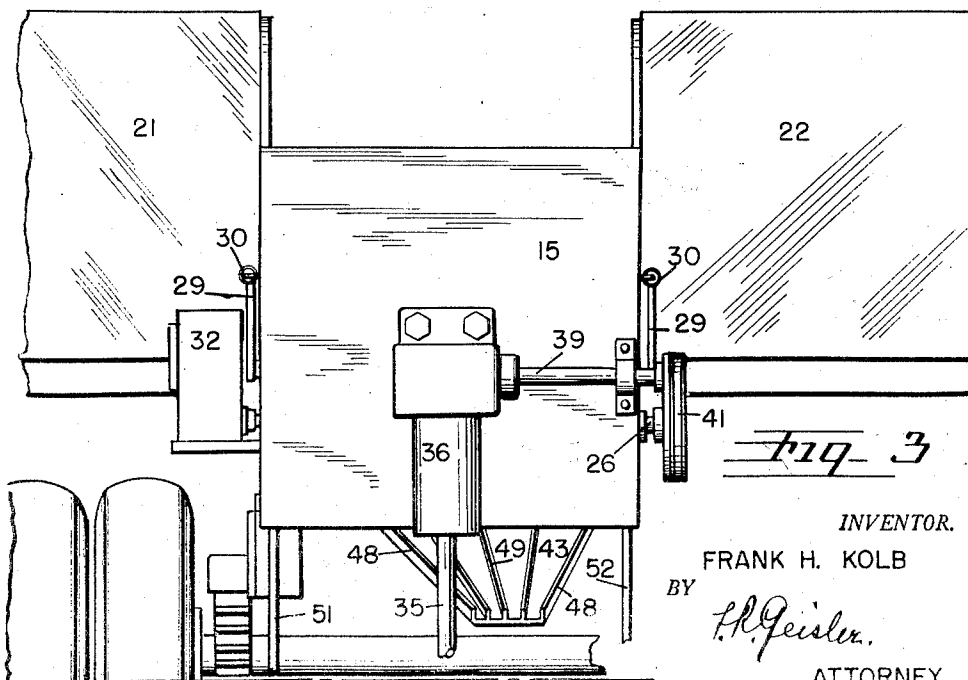
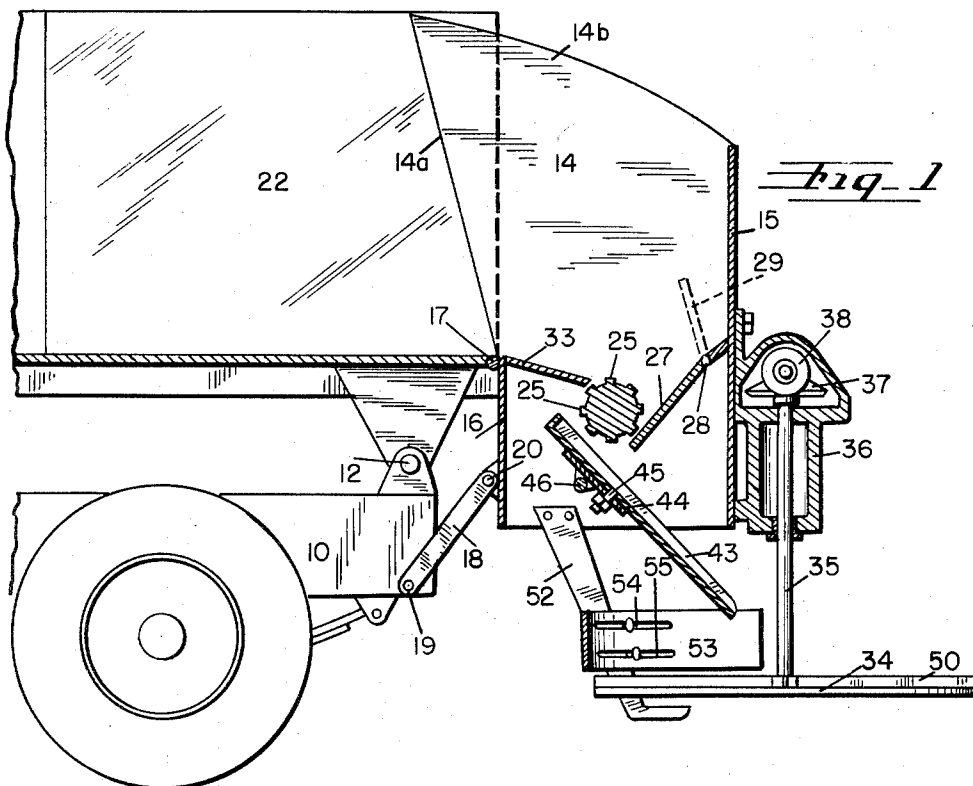
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ROTARY DISC ROAD SANDER

Filed Jan. 3, 1956

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

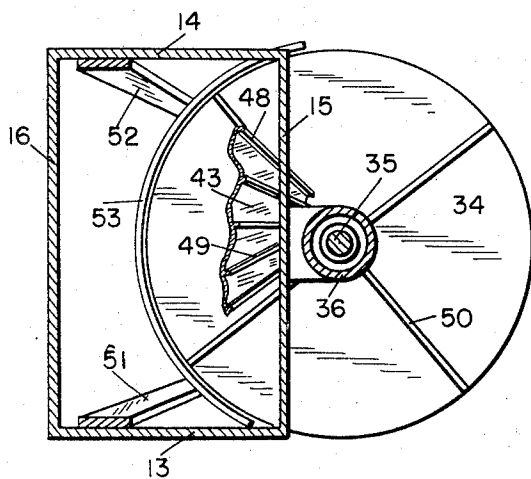
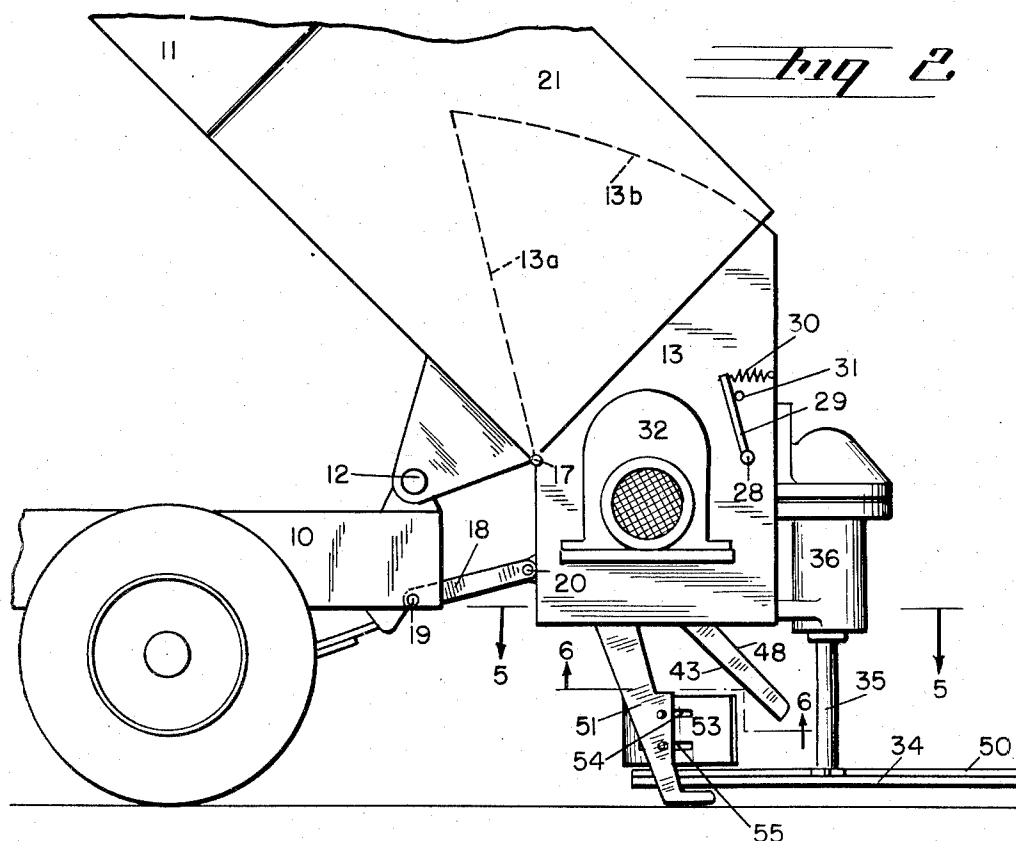


Fig. 5

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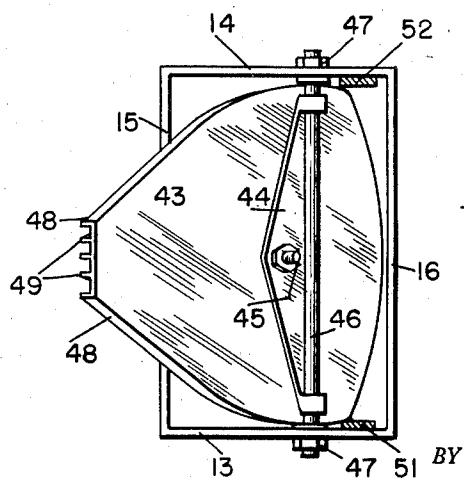
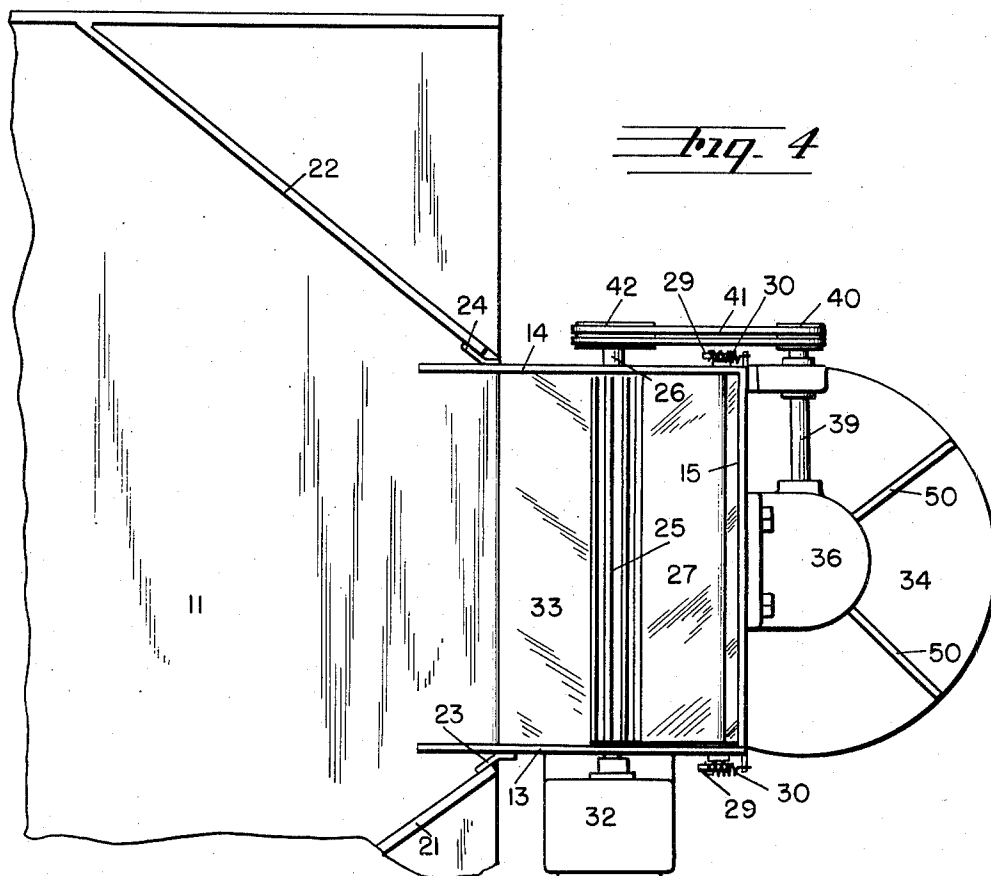
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3 Sheets-Sheet 3



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ROTARY DISC ROAD SANDER

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2 Claims. (Cl. 275—8)

This invention relates in general to devices for distributing or spreading sand or other materials of a similar nature over the surface of road beds, and relates in particular to devices or attachments mounted on the rear of trucks for distributing the sand, or other material carried by the truck, over the road surface during the travel of the truck.

As is well-known, the spreading of sand, cinders, rock salt or other granular materials on highways is often necessary, when icy or slippery conditions prevail, to prevent the slipping and skidding of vehicles and consequent hazards to highway travel.

One of the objects of the present invention is to provide an improved road sander adapted to be easily mounted on the rear of a dump truck type of highway vehicle and also capable of being easily and quickly removed from such vehicle when no longer required.

Another object of the invention is to provide an improved distributing device adapted for mounting on the rear of a truck which will require only a relatively small amount of space at the rear of the truck and which will be simple in construction, as well as compact.

A related object of the invention is to provide such a device which will be also lighter in weight than most of the sanders at present in use in highway maintenance.

In the customary sanding of highways one of the problems encountered is due to the fact that the driver of the sanding truck as a general rule heretofore has been able to control the distributing of the sand or other material over the road or road bed only to a limited extent, if at all. The result has been a considerable waste of material, for example, when only one side of the road needs any sanding. Similarly, when the sanding has to be done in parking areas or on a highway where vehicles are parked along the highway, the desirability of controlling the distribution of the sand or other material is even more important as a means of preventing the throwing of such material against the parked vehicles and the possibility of causing surface damage to such vehicles as a result. A further object of the present invention is, accordingly, to provide a sander in which the operator or driver of the truck will be able to exercise a greater amount of control of the area over which the distribution occurs as the truck is moved along in the sanding operation.

Not infrequently, if the sand to be distributed over an icy road bed is wet, there will be frozen clumps or lumps in the sand, and also there may be other objects such as blocks of wood and stones which have become inadvertently mixed with the sand. An additional object of this invention is to provide an improved distributing device which will crush most frozen clumps of sand or gravel but which at the same time will permit any material or objects which cannot readily be crushed to pass from the device without injuring the device in so doing.

Some of the sanding devices currently employed in highway maintenance use a pair of substantially horizontal rotating disks for scattering the sand or other material. A special object of the present invention is to accom-

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plish the same object in a more satisfactory and efficient manner with the employment of only one such distributing disk and with such single distributing disks limited to relatively small diameter.

A still further object of the invention is to provide an improved road sanding attachment for trucks which will be comparatively inexpensive to manufacture and also simple and easy to maintain in active service.

The manner in which these objects and other advantages are achieved with my improved device and the manner in which the device is constructed and operated will be readily understood from the following brief description with reference to the accompanying drawings:

In the drawings:

Figure 1 is a sectional elevation showing the rear portion of a truck equipped with the road sander, the section being taken approximately along the longitudinal center line of the truck;

Figure 2 is a side elevation of the same but showing the truck bed or dump body raised to maximum discharging position;

Figure 3 is a fragmentary rear elevation of the truck and sander taken from the right of Figure 1;

Figure 4 is a fragmentary top plan view of the same;

Figure 5 is a fragmentary plan section on line 5—5 of Figure 2; and

Figure 6 is a fragmentary bottom plan view of the discharging chute taken on line 6—6 of Figure 2.

Referring first to Figures 1 and 2, the chassis of the vehicle or truck is indicated at 10 and the truck bed or dump body is indicated at 11, this dump body 11 having a pivotal mounting at the rear of the chassis as indicated at 12, to enable the front end of the dump body to be raised in the usual manner for discharging the contents from the dump body.

The sander includes a housing formed of four vertical walls rigidly secured together at right angles to each other (see also Figures 3 and 4), and thus is formed of a pair of identical side walls 13 and 14, a rear wall 15 and a short front wall 16. The front wall 16, as shown in Figure 1, extends only up to the bottom of the dump body and the front wall, and therewith the entire sander housing is hinged to the dump body at 17. A pair of parallel links 18, 18, having their forward ends pivotally connected to the truck chassis at 19, 19, have their opposite ends connected to opposite sides respectively of the front wall 16 by the pivotal mountings 20, 20. As apparent from Figures 1 and 2, the axes of the pivotal connections 12 and 19 and the axes of the hinge and pivotal connections 17 and 20 are substantially in vertical alignment and spaced the same vertical distance apart and thus constitute a parallelogram mounting for the sander housing so as to enable the housing to retain its relatively vertical position while being lowered or raised as a result of the tilting of the dump body.

The width of the sander housing is much less than that of the truck and dump body, the width of the housing preferably, although not necessarily, being limited to approximately 24 inches, and the housing is centrally positioned between the sides of the truck. Consequently, in order to direct the sand or other contents of the dump body into the sander housing, a pair of rear wall partitions 21 and 22 (see Figure 4) are arranged in the rear of the dump body so as to extend obliquely from the main side walls of the dump body to the side walls 13 and 14 of the sander housing. In order to aid in preventing sand from escaping between the ends of these partitions 21 and 22 and the outside of the side walls 13 and 14 of the sander housing, and to allow for relative movement between these rear partitions and walls, the forward ends of the side walls 13 and 14 preferably are sloped for-

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wardly upwardly from hinged mounting 17 as indicated at 13a and 14a, respectively. Also preferably, although not necessarily, these walls have their top edges 13b and 14b curved to correspond more or less to the path of the top edges of the partitions 21 and 22 during the tilting of the dump body. Sealing strips 23 and 24 (Figure 4) of any suitable resilient or flexible material are preferably attached along the rear edges of the partitions 21 and 22 respectively to form more effective bearing surfaces for the side walls of the sander housing.

A ribbed roller 25 (Figures 1 and 4) is mounted in the sander housing and extends across the housing in the relative location indicated in Figure 1. This roller is secured on a shaft 26 which extends through suitable bearings in the side walls 13 and 14. A small gas engine 32, supported on the outside of the housing wall 13, drives the shaft 26 and roller 25, the rotation of the roller being clockwise as viewed in Figure 1.

A stationary baffle 33 extends inside the sander housing from the front wall 16 and terminates close to the ribbed roller 25 as shown in Figure 1. A hinged and spring-mounted control plate 27 is located in the housing on the opposite side of the roller 25. This control plate 27 is secured to a hinge shaft 28 which is rotatably mounted in the side walls of the housing and extends through the side walls and terminates at each end on the outside of the housing in an arm 29. A spring 30 is attached to the end of each of these arms 29, the other ends of the springs 30 being secured to the housing. These springs hold the arms 29 against stops 31 (Figure 2) and thus hold the control plate 27 normally in the position illustrated in Figure 1 with its lower or forward end located in close proximity to the roller 25.

From the arrangement thus far described, it will be apparent from Figure 1 that the sand or other material from the dump body will pass over the baffle 23 to the ribbed roller 25 and be carried by the ribbed roller down between the roller and the control plate 27. The springs 30 which maintain the control plate 27 normally at the position shown in Figure 1 are sufficiently strong and are placed under sufficient tension so that frozen clumps of sand or other material will be broken up between the roller and the control plate. As previously mentioned, frozen clumps or humps frequently occur if sand or gravel is wet and the temperature of the weather is considerably below freezing. But, while frozen clumps will be broken up in this manner, on the other hand, if such objects as stones, blocks of wood, or pieces of scrap iron, which often inadvertently become mixed in with sand or gravel and which cannot easily be broken, attempt to pass between the roller 25 and the control plate 27, the springs 30 for the control plate will permit the latter to move downwardly momentarily to permit these objects to be discharged between the roller and the control plate without damaging the roller.

A rotating disk 34 is secured on the bottom end of a rotating shaft 35 which is supported and rotatably mounted in a gear box and bearing support 36. The gear box and bearing support is bolted or otherwise rigidly secured on the outside of the rear wall 15 of the sander housing. A bevel gear 37 (Figure 1) secured to the top end of the disk shaft 35, meshes with a companion gear 38 secured on the end of a shaft 39 (Figures 3 and 4). A pulley 40 on the other end of shaft 39 is connected by a belt 41 with a driving pulley 42 secured to the outer end of the rib roller shaft 26. Thus, the operation of the motor 32 causes rotation of the ribbed roller 25 and also rotation of the distributing disk 34.

A discharging chute 43 has its upper end positioned inwardly from and below the ribbed roller 25 (Figure 1). At the top end the width of this chute is approximately equal to the width of the interior of the sander housing, as shown in Figure 6, but the width decreases from top to bottom so that the width at the lower or discharging end of the chute is considerably less and preferably from one

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half to one third the width at the top. This chute is adjustably secured on a supporting plate 44 by means of a central clamping bolt 45 mounted in the plate 44. The supporting plate 44, in turn, is secured on a bar 46 (Figures 1 and 6), the ends of which are threaded and extend through the side walls 13 and 14 of the sander housing and are provided with suitable clamping nuts 47 to enable the rod, and therewith the plate 44 and chute 43, to be held against rotation. Thus, the mounting of the chute 43 is such that, upon loosening the clamping nuts 47, the bottom or discharging end of the chute may be raised or lowered with respect to the disk 34, and, by loosening the clamping bolt 45, the discharging or bottom end of the chute may be moved a slight distance to one side or the other with respect to the center of the disk 34. This adjustability of the tapered chute is an important feature of the invention, as will be presently explained.

The chute 43 is provided with side walls 48 and with longitudinally extending guide fins or ribs 49 to direct the sand or other material deposited on the chute from the roller 25 and control plate 27, down to the lower discharging end of the chute and thence onto the disk 34. In this way all the material passing into the sander housing from the dump body of the truck is delivered onto the rotating disk 34, and the rapid rotation of the disk 34 causes the material as deposited on it to be thrown off by centrifugal force in the well-known manner. The disk 34 is provided with radial ribs 50 on its top face to aid in the throwing off of the deposited material.

By adjusting the position of the bottom or discharging end of the chute 43 with respect to the rotating distributing disk 34, it is possible to exercise considerable control over the distribution of the sand or other material thrown off by the disk onto the road. For example, assuming that the speed of rotation of the disk 34 is such that the sand deposited near the center of the disk will reach the disk periphery during 180° of rotation, then, by depositing more sand on one side of the disk center than on the other, the result will be that more sand will be distributed to the opposite side of the road. Similarly, by raising the discharging end of the chute more sand would be deposited on the disk at the rear of the disk center and similarly by lowering the discharging end of the chute more sand would be deposited on the disk in front of the center, thus in the direction in which the truck ordinarily travels. Of course, the resulting distribution of the sand or other material on the surface of the road in this manner will be determined by several variable factors, including the speed at which the distributing disk 34 is rotated, but, given certain fixed operating conditions, it will be apparent that adjustment of the discharging end of the chute, up or down, or to one side or the other, or by composite adjustment, will have a direct effect on the distribution made by the disk 34. The exact results under each set of operating conditions must be determined by test, but, once having been established, these results can be relied upon by the operator. As an example, it has been demonstrated that with a 24 inch disk rotating at the rate of 300 R. P. M., sand can be distributed fairly evenly over the entire width of an ordinary road, or can be confined to less than one half the width of the road, or the distribution can be variably adjusted in between these extremes.

As illustrated in Figure 2, the tilting of the dump body 11 of the truck results in lowering the sander housing and consequently causes the rotating disk 34 to be brought closer to the road surface. In order to protect the rotating disk against any inadvertent contact with any portion of the road surface upon the raising of the dump body to extreme discharging position, a pair of metal bars in the form of shoes or skids 51 and 52 are secured to the sander housing and extend down below and under the disk 34. These skids 51 and 52 serve additionally as mounting brackets for an arcuate shield 53 (Fig-

ures 1, 2 and 5) which is adjustably and removably secured to the skids. This shield 53 has a curvature of approximately the same radius as the periphery of the disk 34 and the length of the shield is preferably about 120°. The shield is provided with pairs of parallel elongated slots 54 and 55, one pair being shown in Figure 1, and clamping bolts carried by the skids 51 and 52 extend through these slots to provide adjustable mounting for the shield and to enable the shield also to be removed entirely when it is not needed. The shield can be used in conjunction with the adjustable chute 43 under certain conditions as for example for preventing any sand from being thrown forwardly towards the truck if this is not desired for one reason or another, and also the shield can serve similarly as additional protecting means for preventing any sand from being thrown to one side, as for instance when sanding is being performed in a parking area and the sanding truck must pass close to parked vehicles, in which case extra precaution is desirable to prevent any sand from striking any parked vehicle.

While some modifications could be made in the individual parts of this improved sander without departing from the principle of the invention, the sander when constructed substantially as illustrated and described herein is considered to be in the preferred form for the carrying out of the invention. The size of the distributing disk could, of course, be varied and corresponding changes made in the size of the other parts of the device, but I have found that the suggested diameter of approximately 24 inches is most satisfactory for ordinary road maintenance purposes and that the use of a larger disk is not necessary.

I claim:

1. A road sander attachment adapted for use with a truck having a dump body, including a housing hingedly attached to the bottom of said dump body at the rear of said body and centrally positioned thereon, said housing consisting of two side walls and front and rear walls all substantially vertical, said side walls and said rear wall extending above and below the bottom of said dump body and said front wall extending downwardly from said dump body bottom, the width of said housing being considerably less than the width of said dump body, side guide plates in said dump body extending from the side walls in said dump body into contact with said side walls of said housing, the bottom of said housing being open, a material-distributing disc positioned at a spaced distance below said housing and secured on a substantially vertical shaft, means on the rear wall of said housing for rotatably supporting said shaft, the diameter of said disc being not greater than the width of said housing, a motor supported on said housing, means connecting said motor with said shaft for rotating said shaft and disc, an inclined chute adjustably mounted in said housing extending downwardly and rearwardly and terminating between said housing and said disc, the width of said chute at the upper end in said housing corresponding approximately to the interior width of said housing and width of said chute at its lower end below said housing being considerably less than the width of said upper end of said chute, a chute-supporting member rotatably mounted in said housing on a horizontal axis, means for securing said chute on said member permitting pivotal

adjustment of said chute laterally on said member, means securing said member in desired rotated position and therewith said chute in desired tilted position on said horizontal axis, whereby said lower end of said chute may be adjusted to a limited extent in any direction with respect to the distributing disc so as to modify the directional distribution of material by said disc, and means in said housing above said chute for directing material to the upper end of said chute.

2. A road sander attachment adapted for use with a truck having a dump body, comprising a housing hingedly attached to the bottom of said dump body at the rear of said body and centrally positioned thereon, said housing consisting of two side walls and said rear wall extending above and below the bottom of said dump body and said front wall extending downwardly from said dump body bottom, the width of said housing being not more than half the width of said dump body, side guide plates in said dump body extending from the side walls in said dump body into contact with said side walls of said housing, the bottom of said housing being open, a material-distributing disc positioned at a spaced distance below said housing and secured on a substantially vertical shaft, means on the rear wall of said housing for rotatably supporting said shaft, the diameter of said disc being approximately equal to the width of said housing, a motor supported on said housing, means connecting said motor with said shaft for rotating said shaft and disc, an inclined chute adjustably mounted in said housing extending downwardly and rearwardly and terminating between said housing and said disc, the width of said chute at its upper end in said housing corresponding approximately to the interior width of said housing and the width of said chute at its lower end being not more than half the width of said upper end, longitudinally-extending material-guiding ribs on said chute, a horizontal shaft rotatably mounted in said housing, a chute-supporting plate secured on said horizontal shaft, means for adjustably securing said chute on said plate permitting pivotal adjustment of said chute laterally on said plate, means for securing said horizontal shaft in desired rotated position and therewith said chute in desired tilted position on said horizontal shaft, whereby said lower end of said chute may be adjusted to a limited extent in any direction with respect to the distributing disc so as to modify the directional distribution of material by said disc, and means in said housing above said chute for directing material to the upper end of said chute.

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