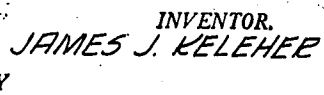


J. J. KELEHER
APPARATUS FOR DISPENSING SMALL ARTICLES
OVER A RESTRICTED AREA

3 Sheets-Sheet 1

Fig 1



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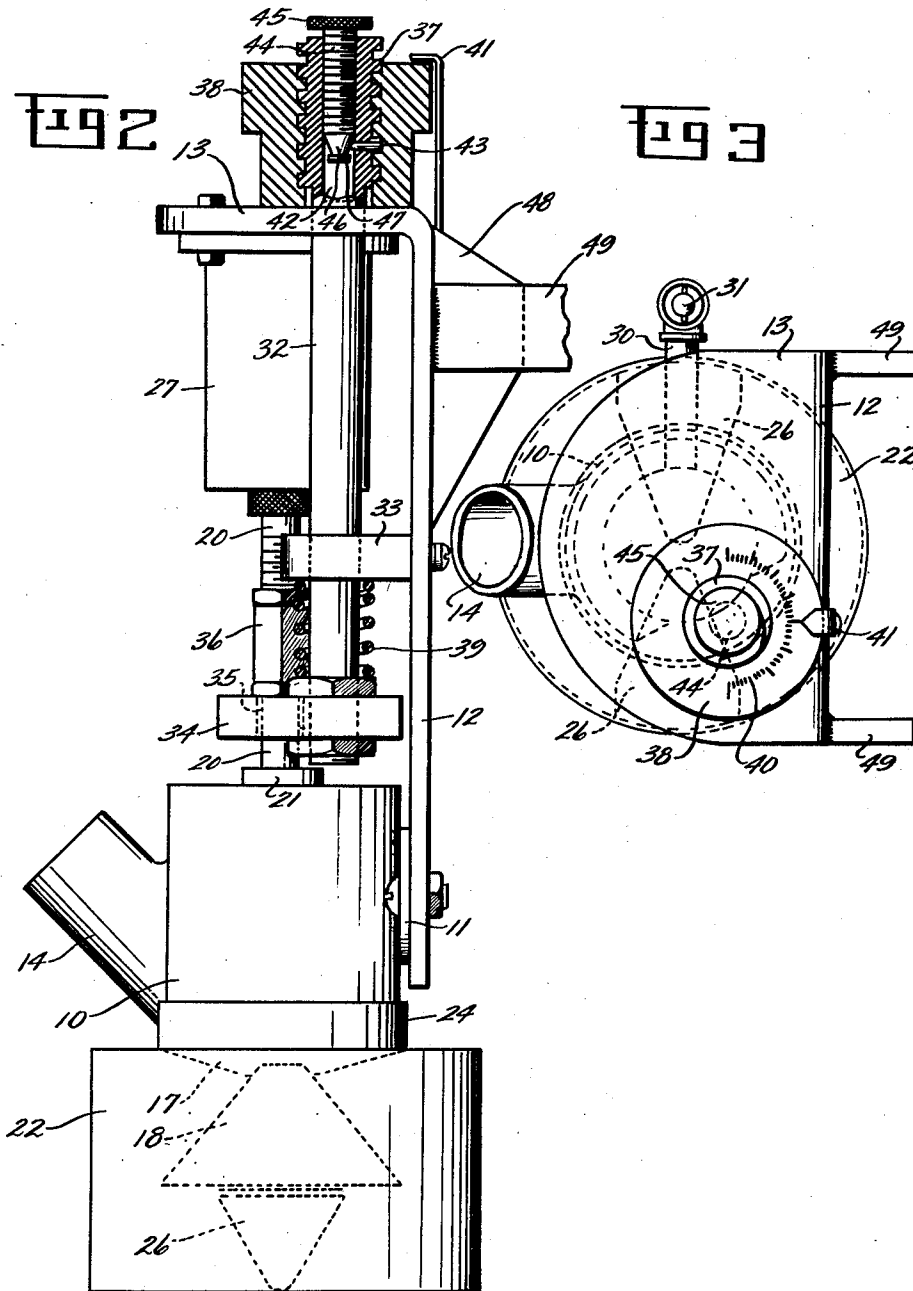
June 9, 1953

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2,641,476

Filed Jan. 14, 1948

3 Sheets-Sheet 2



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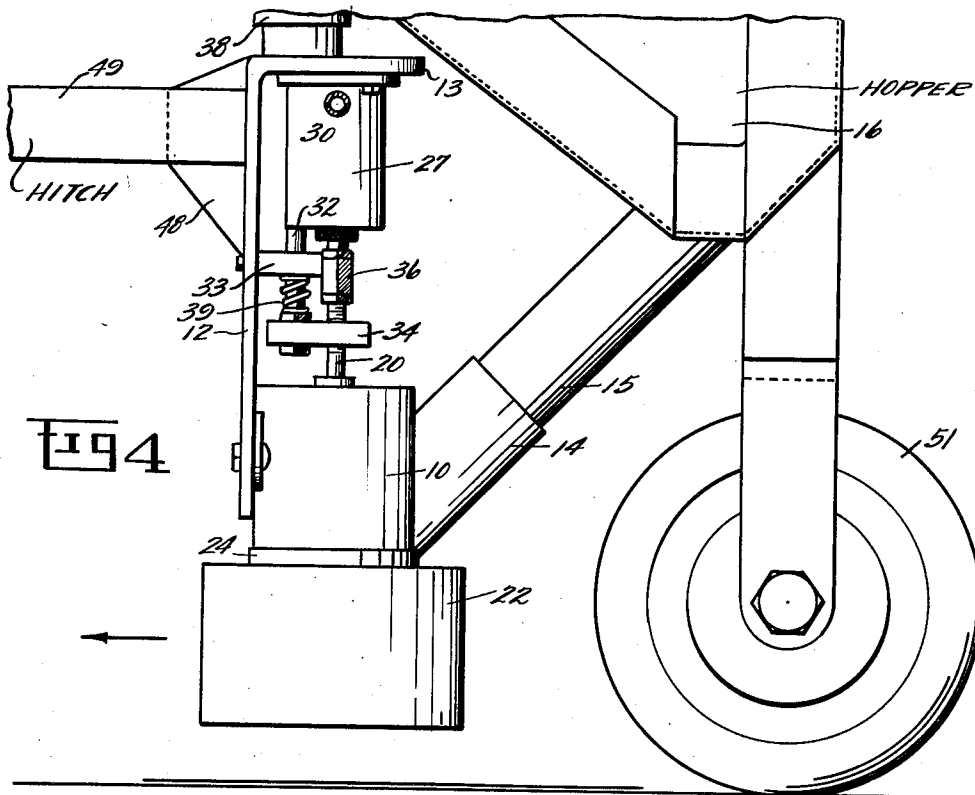
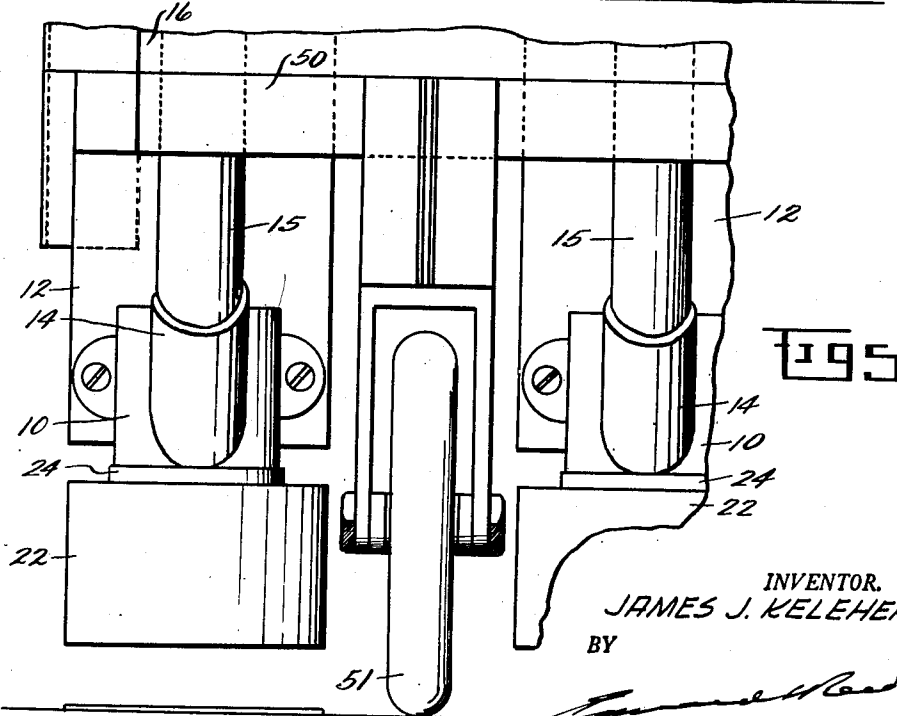
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,641,476

APPARATUS FOR DISPENSING SMALL ARTICLES OVER A RESTRICTED AREA

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Application January 14, 1948, Serial No. 2,338

8 Claims. (Cl. 275—2)

This invention relates to an apparatus for dispensing small articles over a restricted area, and is designed more particularly for distributing minute glass spheres over a binder to form a reflectorized traffic stripe on a highway or the like.

In the production of reflecting traffic stripes on a highway a stripe of a paint-like binder is applied to the highway and minute glass spheres are distributed over the binder while it is wet so that they will be partially embedded therein and will provide the stripe with a reflecting surface. Usually the binder is applied by a striping machine and the sphere dispenser is mounted on or connected with the striping machine in the rear of the binder applying nozzle, so that it is located directly above the applied stripe of binder. Heretofore such dispensers, for the most part at least, have included a rotatable element for discharging and distributing the glass spheres, and the quantity of spheres distributed over a given length of stripe was controlled by the speed at which that element rotated. The operation and control of such a dispenser required a mechanism for driving the rotatable element, clutch means for starting and stopping the rotation thereof and a change in gear ratio when the quantity of spheres distributed over a given length of stripe was to be changed. Consequently the cost of producing and maintaining such a dispenser is high.

One object of the invention is to provide a dispenser which discharges and distributes the glass spheres without the use of a movable element.

A further object of the invention is to provide such a dispenser in which the discharge and distribution of the spheres is effected wholly by gravity.

A further object of the invention is to provide a dispenser in which the discharge of spheres is controlled by the opening and closing of a relatively small outlet.

A further object of the invention is to provide a dispenser which distributes the spheres uniformly over the stripe of binder and confines the distribution thereof to the width of the stripe, so that there is no wasting of the spheres.

A further object of the invention is to provide a dispenser having adjustable means for limiting the extent to which the outlet may be opened, thereby enabling the quantity of beads distributed over a given length of stripe to be quickly and easily changed.

A further object of the invention is to provide

a dispenser which can be manufactured at a relatively low cost and which can be maintained at little or no expense.

Other objects of the invention may appear as the apparatus is described in detail.

In the accompanying drawings Fig. 1 is a rear elevation, partly in section, of a dispenser embodying my invention; Fig. 2 is a side elevation of such a dispenser, partly in section; Fig. 3 is a top plan view of the dispenser; Fig. 4 is a side elevation of a dispenser, including a portion of the supporting structure therefor; and Fig. 5 is a rear elevation of a portion of the supporting structure and of two dispensers.

In these drawings I have illustrated one embodiment of my invention and have shown the same as designed for attachment to a striping machine of a known construction, but it is to be understood that the dispenser as a whole, as well as the several parts thereof, may take various forms and that the dispenser may be propelled in various ways, without departing from the spirit of the invention. It is to be further understood that the dispenser is not limited to the dispensing of glass spheres, commonly called "beads," but may be used, with or without modification, for dispensing small articles of various kinds, either for road striping or for other purposes, and the term "beads" as hereinafter used is intended to include any articles capable of being dispensed by the claimed apparatus.

In the particular construction here illustrated the dispenser comprises a bead receptacle 10 which is preferably of relatively small capacity and is adapted to be connected with a hopper or other bead container of larger capacity. As here shown the receptacle is cylindrical in form and is provided with means, such as apertured ears 11, by which it may be secured to a suitable base, in the present instance an upright plate 12 adapted to be mounted on or connected with a supporting structure and having at its upper end a rearwardly extending part or flange 13. The receptacle is provided in the cylindrical wall thereof with an opening through which beads may be supplied thereto and with an inlet chute 14 leading to the opening and adapted to be connected as by a suitable conduit 15 with a source of supply of beads, such as the hopper 16 shown in Figs. 4 and 5. The receptacle is provided at its lower end with an outlet through which the beads may be discharged therefrom. Preferably the bottom wall 17 of the receptacle is concave in form and has at its center a circular outlet opening 17a through

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which the beads may move by gravity. This outlet is normally closed by a movable member, the opening and closing of which is under the control of an operator at a station more or less remote from the dispenser. The movable member is shown at 18 as located below the outlet and of such a character that it functions both as a valve member to control the flow of beads through the outlet and as a spreader to spread the beads which are discharged through the outlet. It is preferably frusto-conical in form and the upper end portion thereof is adapted to enter the outlet and to engage a valve seat surrounding the outlet. This valve seat may be the edge of the bottom wall but preferably the edge of the bottom wall about the outlet is provided with a sealing member 19, of rubber or other yieldable material, which will firmly engage the inclined surface of the valve member so as to prevent the passage of beads when the valve member is in its closed position, it being remembered that the beads used for road striping are often as small as .004 of an inch in diameter. The valve member is supported and actuated by a rod 20 secured to the upper end thereof and extending upwardly through the outlet and through a bearing 21 in the top wall of the bead receptacle, the rod being actuated in a manner which will be hereinafter described.

The distribution of beads discharged through the outlet is confined to a restricted area, in the present instance to a width closely approximating the width of the stripe of binder to which the beads are applied. For this purpose a skirt 22, preferably circular in form, is supported about the valve member with its upper edge slightly above the outlet 17a and with its lower edge extending downwardly below the lower edge of the valve member. The skirt is preferably carried by the receptacle 10, which extends slightly below the base plate 12, and has at its top an inwardly extending portion 23 provided with an annular flange 24 which extends upwardly about the lower portion of the receptacle. In the particular construction illustrated the bottom wall 17 is separate from the body of the receptacle and is provided with a flange 25 which is rigidly supported in the lower portion of the flange 24 of the skirt in abutting contact with the lower edge of the cylindrical wall of the receptacle, which extends into the upper portion of the flange 24. The diameter of the skirt is such as to define the lateral spread of the beads and in order to distribute the beads uniformly over the area thus defined baffles 26 are mounted within the skirt. In the present instance there are two baffles connected with the diametrically opposite sides of the skirt and extending inwardly and downwardly therefrom to points located below the valve member. The lateral edges of each baffle converge toward the inner end thereof. Thus portions of the beads leaving the valve member or spreader will fall upon the baffles and will be carried inwardly toward the center of the stripe and the beads as a whole will be uniformly distributed over the stripe.

The opening and closing movements of the valve member may be controlled in any suitable manner. Preferably the valve member is normally yieldably retained in its closed position and power means are provided for moving the same to its open position. In the present construction the rod 20 extends upwardly above the receptacle into a fluid cylinder 27, mounted on the upper portion of the base plate 12, and is connected with a piston 28 within the cylinder. A spring 29 confined between the lower end of the cylinder and

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the piston urges the latter upwardly and thus yieldably maintains the valve member on its seat. A fluid conduit 30 is connected with the cylinder above the piston and is adapted to be connected, as by a fitting 31, with a valve controlled conduit, not shown, which extends to a source of supply of fluid, preferably air, under pressure. Thus upon the admission of air to the cylinder the valve is moved to outlet opening position and is retained in that position as long as the air pressure on the piston is maintained. When the air pressure is cut off the spring returns the valve member to outlet closing position.

Means are provided for positively limiting the opening movement of the valve member so that the outlet will have a fixed capacity so long as the air pressure on the piston is maintained. To enable the capacity of the outlet to be varied and to thereby increase or decrease the quantity of beads distributed over a given area, the means for limiting the opening movement of the valve member is made adjustable. In the arrangement here shown a vertically movable adjusting rod 32 is mounted in a bearing 33 secured to the base plate and extends upwardly through the rearwardly extending part 13 of the base plate. Secured to the lower portion of this adjusting rod is a stop 34 having an opening 35 through which the rod 20 extends, and the rod 20 has a part arranged above the stop 34, and of greater width than the opening 35 so as to limit the downward movement of the rod with relation to the stop. In the present instance, to facilitate assembly, the rod is formed in two parts which are connected one to the other by a coupling device 36 and this coupling device is utilized as the part, or stop, on the rod 20 which cooperates with the stop 34 on the adjusting rod 32. That part of the adjusting rod which extends above the part 13 of the base plate is provided with thread 37 and a nut 38 is mounted on this threaded portion of the rod and contacts with the upper surface of the part 13 of the base plate. A spring 39 confined between the stop 34 and the bearing 33 urges the adjusting rod downwardly. The rotation of the nut 38 in one direction will move the stop 34 upwardly and the rotation of the nut in the other direction will permit the adjusting rod to be moved downwardly by the spring 39, thus enabling the stop to be moved to and retained in an exactly adjusted position. To facilitate the adjustment of the stop the nut 38 has on its top surface a series of graduations 40 with which cooperates a fixed pointer 41. The graduations are preferably calibrated in miles per hour so that the distribution of the beads can be regulated according to the speed at which the striping machine, or other movable support for the dispenser, moves. To avoid the possibility of the adjusting nut 38 being inadvertently rotated, by the vibration of the striping machine or otherwise, there is provided a positive lock for the nut. In the arrangement shown the threaded end portion of the adjusting rod 32 is provided with an axial bore 42 and a pin 43 extends loosely through one convolution of the thread 37 into the bore 42. A screw 44, having a knurled head 45, is threaded into the bore 42 and is provided at its lower end with a tapered portion 46 adapted to engage the pin 43 and move the same outwardly to cause the outer end of the pin to firmly engage the nut 38 and lock the latter against movement. After the stop 34 has been adjusted the screw 44 is moved downwardly to

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lock the nut. Preferably the tapered end of the screw 44 is provided with an enlargement or flange 47 which will engage the pin 43 and prevent the screw from being moved outwardly far enough to release the pin and permit it to escape from the opening in which it is supported.

The base plate 12 is provided with forwardly extending lugs 48 by which it may be connected by a supporting member or draft bar 49, with a part of the striping machine or other vehicle to which the dispenser is attached. In Figs. 4 and 5 I have shown one means for supporting the dispenser and attaching the same to the propelling vehicle. As there shown two dispensers are connected side by side to simultaneously apply the beads to parallel stripes of binder on the highway. The two dispensing units are rigidly connected one with the other by a cross bar 50 and are both connected with a single hopper 16. Supported from the cross bar 50 is a wheel 51 which supports the hopper and thus provides a rear support for the dispensers, the forward portions of which are connected with and supported by the draft bar or hitch by which they are connected with the propelling vehicle.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof, as various modifications may occur to a person skilled in the art.

Having now fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. An apparatus for dispensing beads over an elongate narrow area of a road surface, comprising a bead receptacle adapted to be connected with a vehicle for movement therewith and having in the bottom thereof an outlet through which beads may flow by gravity, a movable valve member to open and close said outlet, said valve member having a part extending about and laterally beyond said outlet into the path of the beads discharged through said outlet to deflect and spread said beads; a skirt connected with said receptacle, extending downwardly beyond the same in laterally spaced relation to said outlet and terminating adjacent to but spaced from said road surface to limit the spread of said beads to an area defined by said skirt, baffles carried by and extending inwardly from said skirt below said valve member to distribute said beads substantially uniformly over said area, an actuating device connected with said valve and biased in valve closing direction, and a power operated device acting through said actuating member to move said valve member to outlet opening position.

2. An apparatus for dispensing beads over an elongate narrow area of a road surface, comprising a bead receptacle adapted to be supported on a vehicle for movement therewith and having in the bottom thereof an outlet for beads, a frusto-conical valve member to open and close said outlet, the lower portion of which is of a diameter materially greater than the diameter of said outlet to laterally deflect and spread beads discharged from said outlet, a skirt connected with said receptacle about said outlet, extending downwardly therefrom to a position adjacent to but spaced from said road surface and of a diameter greater than the maximum diameter of said valve member to limit the spread of said beads, a baffle supported in said skirt beneath said valve member to spread said beads uniformly over an area defined by said baffle, an

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actuating member connected with said valve and biased in outlet closing direction, and a power operated device acting through said actuating member to move said valve member in outlet opening direction.

3. An apparatus for dispensing beads over an elongate narrow area of a road surface, comprising a bead receptacle adapted to be supported on a vehicle for movement therewith and having in the bottom thereof an outlet for beads, a frusto-conical valve member to open and close said outlet, the lower portion of which is of a diameter materially greater than the diameter of said outlet to laterally deflect and spread the beads discharged from said outlet, a skirt connected with said receptacle about said outlet, extending downwardly therefrom to a position adjacent to but spaced from said road surface and of a diameter greater than the maximum diameter of said valve member to limit the spread of said beads, relatively narrow, inwardly tapered and downwardly inclined baffles supported on said skirt to distribute said beads over the area defined by said skirt, an actuating member connected with said valve and biased in outlet closing direction, and a power operated device acting through said actuating member to move said valve member in outlet opening direction.

4. In an apparatus for dispensing beads over an elongate narrow area of a road surface, a supporting structure adapted to be connected with a vehicle for movement therewith, a bead receptacle supported by said structure and having a bottom wall provided with an outlet, an actuating rod extending through said receptacle, a valve member connected with said rod below said outlet for movement thereby toward and from said outlet to control the flow of beads through said outlet, a resilient device supported by said structure and acting on said rod above said receptacle to constantly urge said valve toward said outlet, a power operated device mounted on said supporting structure above said receptacle and acting on said rod to move said valve toward its open position, a skirt connected with said receptacle in radially spaced relation to said outlet, extending downwardly beyond said valve member and terminating in narrowly spaced relation to said road surface, said valve member having a circumferential part extending outwardly beyond said outlet in the path of beads discharged from said outlet to deflect said beads toward said skirt, and baffles supported in said skirt to distribute said beads substantially uniformly over the area defined by said skirt.

5. In an apparatus for dispensing beads over an elongate narrow area of a road surface, a supporting structure adapted to be connected with a vehicle for movement therewith, a bead receptacle supported by said structure and having a bottom wall provided with an outlet, an actuating rod extending through said receptacle, a valve member connected with said rod below said outlet for movement thereby toward and from said outlet to control the flow of beads through said outlet, a resilient device supported by said structure and acting on said rod above said receptacle to constantly urge said valve toward said outlet, a power operated device mounted on said supporting structure above said receptacle and acting on said rod to move said valve toward its open position, a skirt connected with said receptacle in laterally

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spaced relation to said outlet and extending downwardly beyond said valve member to a position adjacent to but spaced from said road surface, said valve member having a circumferential part extending outwardly beyond said outlet in the path of beads discharged from said outlet to deflect said beads toward said skirt, baffles arranged in said skirt to distribute said beads substantially uniformly over the area defined by said skirt, and a conduit to connect said receptacle with a source of beads and to deliver beads to said receptacle while said valve member is in its open position.

6. In an apparatus for dispensing beads over an elongate narrow area of a road surface, a supporting structure adapted to be connected with a vehicle for movement therewith, a bead receptacle supported by said structure and having a bottom wall provided with an outlet, an actuating rod extending through said receptacle, a valve member connected with said rod below said outlet for movement thereby toward and from said outlet to control the flow of beads through said outlet, a resilient device supported by said structure and acting on said rod above said receptacle to constantly urge said valve toward said outlet, a power operated device mounted on said supporting structure above said receptacle and acting on said rod to move said valve toward its open position, a skirt connected with said receptacle in laterally spaced relation to said outlet and extending downwardly beyond said valve member to a position adjacent to but spaced from said road surface, said valve member having a circumferential part extending outwardly beyond said outlet in the path of beads discharged from said outlet to deflect said beads toward said skirt, baffles arranged in said skirt to distribute said beads substantially uniformly over the area defined by said skirt, and parts connected respectively with said rod and with said structure and co-operating to limit the movement of said actuating rod by said power operated device.

7. In an apparatus for dispensing beads over a narrow area of a surface to which beads are to be applied, a bead receptacle having an outlet in the bottom thereof, means for supporting said receptacle for movement over the surface to which beads are to be applied, a valve member supported below said receptacle for movement toward and from said outlet and having a part extending laterally beyond all sides of said outlet into the path of the beads discharged through said outlet to deflect said

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beads laterally with relation to said outlet, a rod connected with said valve member and extending through said outlet to a position above said receptacle, means connected with said rod above said receptacle for biasing said rod in outlet closing direction, means connected with said rod above said receptacle for moving said valve member in outlet opening direction, a skirt connected with said receptacle and extending downwardly about and beyond said valve member in laterally spaced relation thereto to limit the spread of the beads by said valve member, and narrow baffles extending inwardly and downwardly from said skirt to points beneath said valve member, each baffle having inwardly converging lateral edges.

8. In an apparatus for dispensing beads over a narrow area of a surface to which beads are to be applied, a bead receptacle having an outlet in the bottom thereof, means for supporting said receptacle for movement over the surface to which beads are to be applied, a rod movably mounted upon said supporting means and extending through said receptacle and said outlet, a frusto-conical valve member connected at its smaller end with said rod for movement thereby into and out of outlet closing position, spring means continuously urging said rod in outlet closing direction, power operated means on said supporting means for moving said rod in outlet opening direction, a circular skirt connected with said receptacle and extending downwardly beyond said valve member in radially spaced relation thereto, and bead distributing baffles supported on and extending inwardly from the circular wall of said skirt into the paths of the beads discharged over said valve member.

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References Cited in the file of this patent UNITED STATES PATENTS

Number	Name	Date
539,812	Hill	May 28, 1895
883,564	Parrish	Mar. 31, 1908
933,699	De Laurence	Sept. 7, 1909
1,323,663	Weber	Dec. 2, 1919
1,796,032	Kestel	Mar. 10, 1931
1,825,066	Irwin	Sept. 29, 1931
2,293,269	Rufus	Aug. 18, 1942
2,319,865	James	May 25, 1943
2,369,983	Rodli et al.	Feb. 20, 1945
2,407,628	Clark	Sept. 17, 1946
2,508,195	Seaman et al.	May 16, 1950