

Nov. 15, 1955

T. H. DWYER
BEAD DISPENSER

2,723,782

Filed May 15, 1952

2 Sheets-Sheet 1

Fig. 1

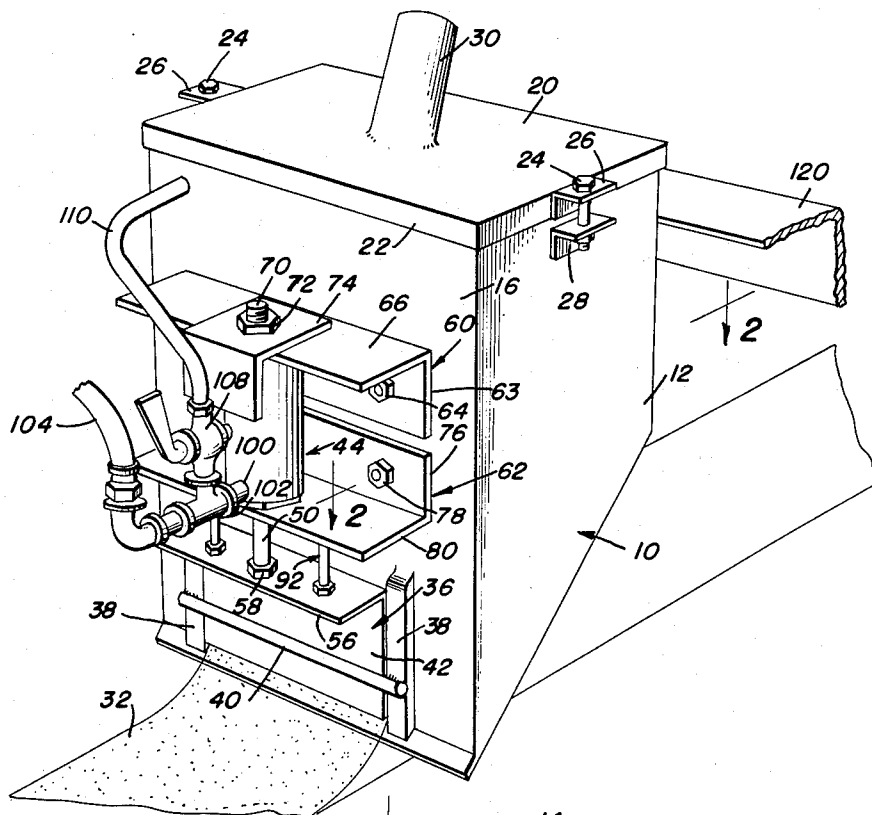
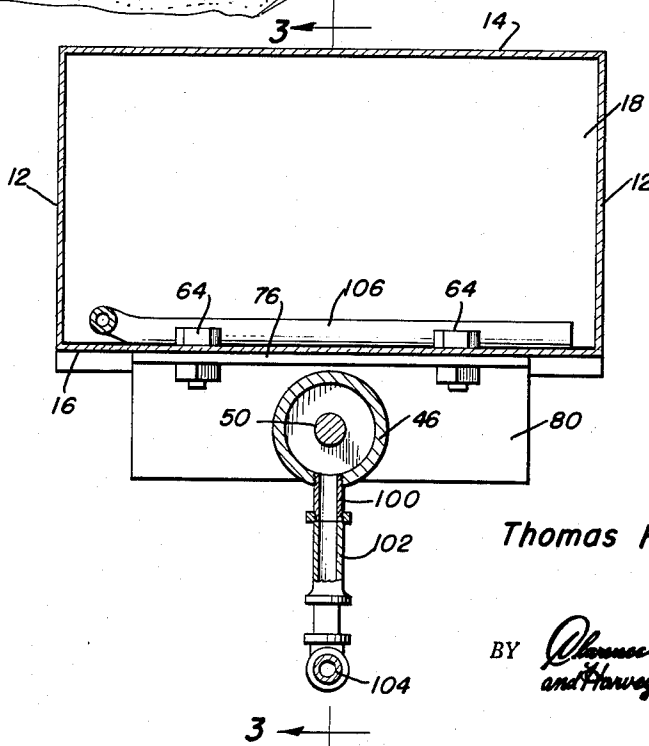


Fig. 2



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Fig. 3

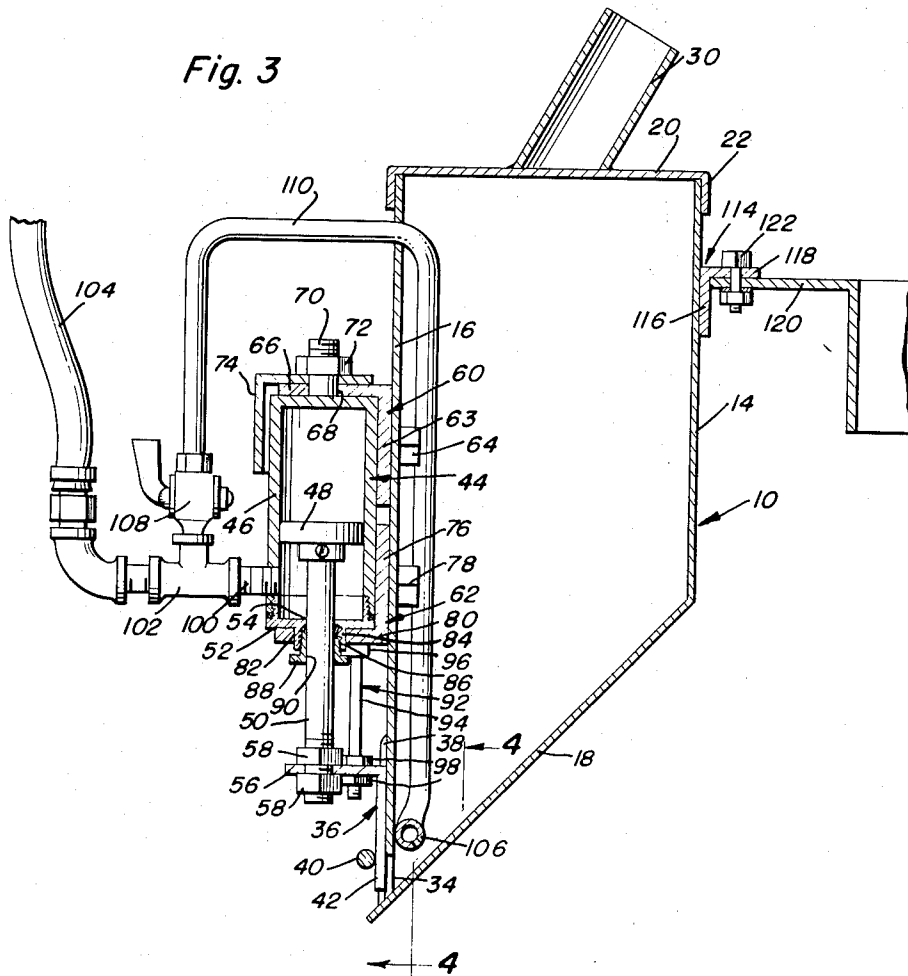
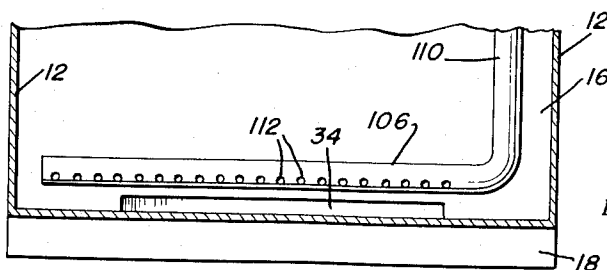


Fig. 4



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2,723,782

BEAD DISPENSER

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Application May 15, 1952, Serial No. 287,974

2 Claims. (Cl. 222—195)

This invention relates in general to dispensers, and more particularly to a bead dispenser for discharging beads along a painted stripe on highways and the like.

In order to provide a center line for highways which may be clearly visible to drivers at night, it has become the practice of some States to deposit a thin layer of small glass spheres or beads on the surface of a freshly painted center line. Inasmuch as the center line of paint is applied by mechanical means, it is desirable to provide a bead dispenser which will automatically deposit the desired amount of beads on the painted center line.

The primary object of this invention is to provide an improved bead dispenser adapted to be mounted on a paint striping machine for automatically depositing beads on a freshly painted center line.

Another object of this invention is to provide an improved bead dispenser having means for adjusting the quantity of beads dispensed therefrom and having remote control actuating means for controlling the dispensing of the beads.

Another object of this invention is to provide an improved bead dispenser which is of relatively simple construction and which may be easily and quickly attached to conventional paint striping machines and is economically feasible.

A further object of this invention is to provide an improved bead dispenser which includes a hopper having a discharge opening, said hopper being provided with jet means for urging the beads through the discharge opening thereof.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be hereinafter described in detail in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which form a material part of this specification, and in which:

Figure 1 is a perspective view of the rear portion of the improved bead dispenser, which is the subject of this invention, the bead dispenser being attached to a rear frame member of a paint striping machine and is illustrated as dispensing beads upon a freshly painted stripe;

Figure 2 is an enlarged transverse horizontal sectional view taken substantially upon the plane indicated by the section line 2—2 of Figure 1 and shows the general arrangement of the hopper and means for actuating a gate element which controls the discharge opening of the hopper, and a compressed air pipe within the hopper for urging movement of the beads toward the discharge opening;

Figure 3 is an enlarged transverse vertical sectional view taken substantially upon the plane indicated by the section line 3—3 of Figure 2 and shows the manner in which the bead dispenser is secured to a rear frame member of a paint striping machine, and the general construction of means for actuating a gate element closing the discharge opening of the hopper; and,

Figure 4 is a fragmentary transverse vertical sectional

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view taken substantially upon the plane indicated by the section line 4—4 of Figure 3 and shows the general construction of a compressed air tube for urging the movement of beads toward the discharge opening of the hopper.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the different views of the drawings.

Referring now to the accompanying drawings in detail, it will be seen that the bead dispenser, which is the subject of this invention, includes a hopper which is referred to in general by the reference numeral 10. The hopper 10 includes a pair of spaced parallel side walls 12 which are connected together by front and rear walls 14 and 16, respectively, the front wall 14 terminating above the lower end of the rear wall 16. The bottom of the hopper 10 is closed by a downwardly and rearwardly sloping bottom wall 18 which extends slightly below and rearwardly of the rear wall 16.

The upper end of the hopper 10 is open and has mounted thereon a generally rectangular cover 20 which has a downwardly extending flange portion 22 telescoped over the upper end of the hopper 10. The cover 20 is secured to the hopper 10 by a pair of fasteners 24 disposed on opposite sides thereof. Each fastener 24 passes through one flange of an angle bracket 26 carried by the flange portion 22 of the cover and an adjacent angle bracket 28 carried by one of the side walls 12. The cover 20 is also provided with an upwardly extending tube 30 which communicates with the interior of the hopper 10 and is intended for use in supplying beads to the hopper 10 from an overhead storage container (not shown).

The hopper 10 is intended primarily for the storage of small glass beads 32 and the rear wall 16 thereof is provided with a narrow elongated discharge opening 34 located centrally thereof at its extreme lower end. In order that the flow of beads 32 through the discharge opening 34 may be controlled, the rear wall 16 has mounted thereon a gate element, which is referred to in general by the reference numeral 36. It will be noted that the rear wall 16 of the hopper 10 is provided with a pair of vertically extending guide strips 38 adjacent the ends of the discharge opening 34 and that said guide strips 38 have extending between and secured to the rear faces thereof a transversely extending guide rod 40.

The gate element 36 includes a vertical flange 42 which has one face thereof in abutting engagement with the rear wall 16 of the hopper 10 and is positioned between the guide strips 38. The vertical flange 42 is also positioned between the guide rod 40 and the rear wall 16 whereby it is retained between the guide strips 38 by the guide rod 40.

In order that the gate element 36 may be moved between a discharge opening closing position and an open position thereof, the bead dispenser is provided with a fluid cylinder which is referred to in general by the reference numeral 44. The fluid cylinder 44 includes a vertically extending cylinder portion 46 in which is mounted for reciprocation a piston 48 which is in turn secured to the upper end of a vertically extending piston rod 50. The piston 48 is retained within the cylinder 46 by a cap member 52 threadedly connected to the cylinder 46 and closing the lower end thereof. The piston rod 50 extends through a concentric opening 54 in the cap member 52 and has its lower end secured to a horizontal flange 56 of the gate element 36. The lower end of the piston rod 50 is threaded and has adjustably mounted thereon a pair of nuts 58 through which the relationship of the horizontal flange 56 with respect to piston rod 50 may be vertically adjusted.

In order that the fluid cylinder 44 may be conveniently mounted on the hopper 10, the hopper 10 has rear wall 16 thereof provided with a pair of closed angle brackets,

which are referred to in general by the reference numerals 60 and 62, respectively. The angle bracket 60 is the uppermost of the two and has a vertical flange 63 which is in face to face engagement with the rear surface of the rear wall 16 and secured thereto by a plurality of fasteners 64. The angle bracket 60 is also provided with a horizontal flange 66 having an opening 68 therethrough through which is passed a vertically extending stud member carried by the upper end of the cylinder 46. The stud member 70 has threadedly engaged thereon a nut 72 which maintains the upper end of the cylinder 46 clamped against the underside of the horizontal flange 66 and secures an angle member 74 to the upper side of the horizontal flange 66.

The angle bracket 62 includes a vertical flange 76 which is secured to the rear wall 16 of the hopper 10 by fasteners 78, the vertical flange 76 being spaced below the vertical flange 62 of the angle bracket 60. The angle bracket 62 also has a horizontal flange 80 which has a large opening 82 therethrough through which projects a downwardly extending sleeve portion 84. The sleeve portion 84 is concentric with the opening 54 in the cap member 52 and integral therewith, and is provided with an internally threaded bore 86 concentric with the opening 54. The piston rod 50 extends through the bore 86 and is sealed with respect thereto by a packing nut 88 threadedly engaged therein, the piston rod passing through a concentric bore 90 in the packing nut 88.

In order that the vertical movement of the gate element 36 may be limited, the horizontal flange 56 is provided with a pair of vertically extending stop elements, which are referred to in general by the reference numeral 92. Each of the stop elements 92 is in the form of an elongated bolt 94 having a head portion 96 engageable with the underside of the horizontal flange 80. The lower threaded end of the bolt 94 has threadedly engaged thereon nuts 98 which are positioned on opposite sides of the horizontal flange 56 of the gate element 36 and adjustably secures the bolt member 94 thereto.

In order that the fluid cylinder 44 may have its piston 48 actuated, the cylinder 46 is provided with an inlet 100 adjacent the lower end thereof. Secured to the inlet 100 is a T-fitting 102 which is in turn connected by other fittings to a compressed fluid supply line 104 which communicates the T-fitting 102 with a compressed fluid supply tank (not shown). It will be understood that the fluid supply line 104 is provided with a control valve (not shown) through which an operator may control the flow of compressed fluids, such as air, to the fluid cylinder 44. As compressed fluid enters the cylinder 46 below the piston 48, the pressure exerted thereby urges the piston 48 upwardly with the result of the upward movement of the piston rod 50. Inasmuch as the gate element 36 is secured to the lower end of the piston rod 50, it is also moved vertically with the result that the discharge opening 34 becomes open. When pressure is released from the compressed fluid supply line 104, the piston 48 is permitted to move downwardly once again due to the weight of the piston rod 50 and the gate element 36.

Inasmuch as the hopper 10 is intended for dispensing glass beads which are very small in size, there is a tendency for the beads to stick together when damp and therefore will not be properly dispensed from the discharge opening 34. To overcome this deficiency, the hopper 10 has been provided with a transversely extending pipe 106 mounted on the inner surface of the rear wall 16 in spaced parallel relation to the discharge opening 34 adjacent the upper edge thereof. The transversely extending pipe 106 is connected to a shutoff valve 108 by piping 110, and the shutoff valve 108 is in turn connected to the T-fitting 102 whereby compressed fluid, such as air, may be passed into the pipe 106. The pipe 106 has its free end closed and is perforated throughout its length, as is best illustrated in Figure 4. When the shutoff valve 108 is open and compressed fluids are being passed

through the fluid supply line 104, the compressed fluids passed through the perforations 112 in the pipe 106 and urge glass beads 32 stored in the hopper 10 down along the sloping bottom wall 18 and out through the discharge opening 34.

In order that the bead dispenser, which is the subject of this invention, may be conveniently connected to a conventional paint striping machine, the front wall 14 thereof is provided with a transversely extending mounting bracket 114. The mounting bracket 114 includes a vertical flange 116 secured to the front wall 14 and the horizontal flange 118. The horizontal flange 118 is adapted to overlie and be secured to a horizontal flange 120 by a plurality of fasteners 122, the horizontal flange 120 being a portion of the rear frame member of a conventional paint striping machine.

It will be understood that the bead dispenser, which is the subject of this invention, is intended for use with numerous types of paint striping machines now in production and that the same may be secured thereto in any conventional manner other than that illustrated in Figure 3. While only one hopper 10 has been illustrated, it will be understood that a bead dispenser conforming with the teaching of this invention may include a plurality of such hoppers.

The operation of this device will be understood from the foregoing description of the details thereof, taken in connection with the above recited objects and drawings. Further description would appear to be unnecessary.

Minor modifications of the device, varying in minor details from the embodiment of the device illustrated and described herein, may be resorted to without departure from the spirit and scope of this invention, as defined in the appended claims.

Having described the invention, what is claimed as new is:

1. A bead dispenser comprising a vertically disposed hopper having a downwardly sloping bottom, the vertical side wall connected to the lowermost edge of the bottom having a horizontally elongated discharge opening therein, a gate element slidably positioned on said side wall for selectively closing said opening, fluid pressure actuation means for said gate element, guide means on said side wall for guiding reciprocal movement of said gate element, a fluid pressure device within said hopper for agitating the beads and urging the discharge of the beads through said discharge opening, a single conduit means supplying fluid pressure to the actuation means and device for simultaneously operating said actuating means and device, and means for adjusting the scope of movement of said gate element thereby adjusting the rate of discharge of the beads, said device including a pipe disposed slightly above the upper edge of the opening, said pipe having a plurality of perforations generally directed downwardly towards said bottom and opening.

2. A device for dispensing beads in a thin continuous strip for applying a coating of beads to a strip of wet paint comprising a vertically disposed hopper having vertical side, front and rear walls interconnected by a sloping bottom, said bottom projecting rearwardly beyond said rear wall, said rear wall having a relatively narrow horizontally elongated discharge opening at the juncture of the rear wall and bottom whereby the projecting portion of the bottom forms a chute for guiding the continuous strip of beads onto the wet paint strip, a gate element mounted on said rear wall for selectively overlying the opening for controlling the flow of beads, guide means on said rear wall for retaining the gate element slidably against the outer surface of the rear wall for vertical reciprocation, adjustable stop means on said gate element for limiting the upward vertical movement thereof for adjusting the thickness of the strip of beads being discharged, a fluid pressure actuated piston and cylinder arrangement supported on said rear wall and having a vertically reciprocal piston rod adjustably connected to

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said gate element for reciprocation thereof, a fluid pressure supply line connected to said piston and cylinder arrangement for actuation thereof, an elongated horizontally disposed pipe having one closed end disposed against the inner surface of the rear wall at the upper edge of said opening, said pipe having a plurality of downwardly directed perforations, and conduit means communicating the pipe with the fluid pressure supply line whereby fluid pressure will be discharged through the perforations for agitating the beads adjacent the discharge opening when the piston and cylinder arrangement is supplied with fluid pressure for opening said gate

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element thereby assuring discharge of beads through the opening at substantially a constant rate.

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