

Jan. 30, 1962

C. E. SEARIGHT

3,018,704

STRIPE APPLICATOR FOR PAVEMENTS

Filed Dec. 15, 1958

2 Sheets-Sheet 1

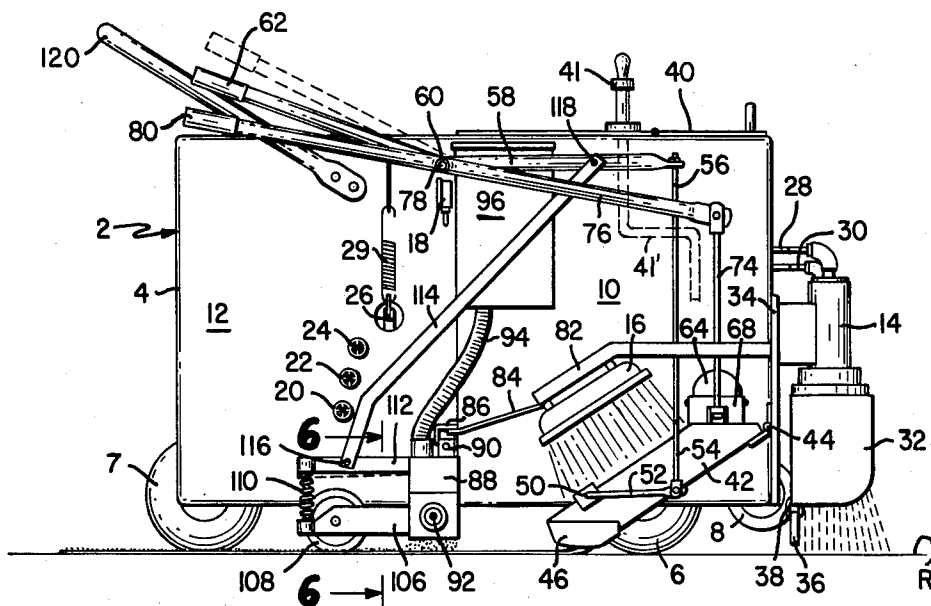


Fig. 1

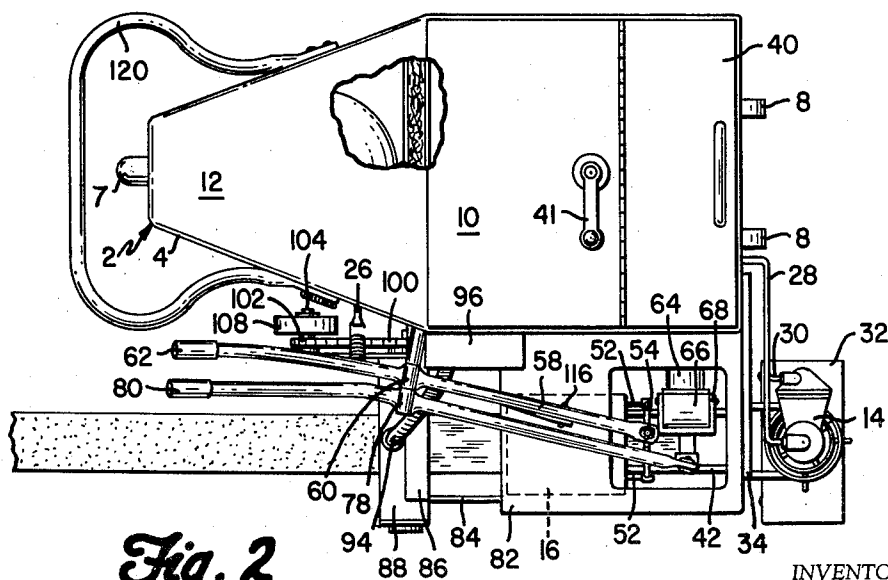


Fig. 2

INVENTOR.

CHARLES E. SEARIGHT

BY

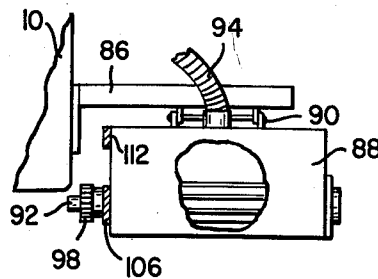
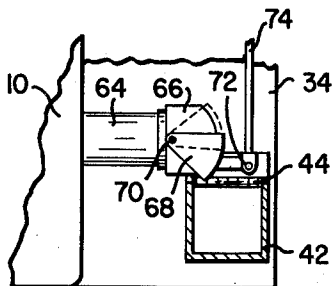
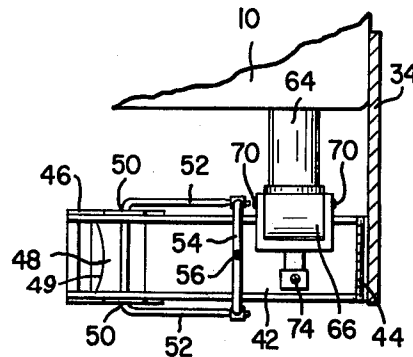
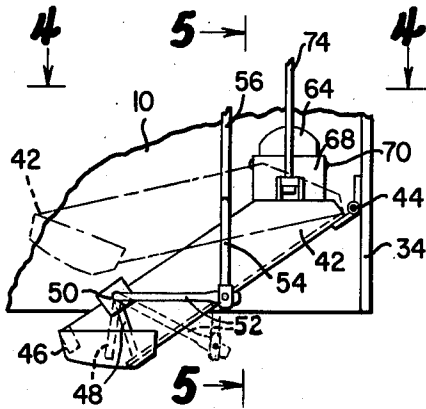
Frederick W. Fraser

ATTORNEY

C. E. SEARIGHT

STRIPE APPLICATOR FOR PAVEMENTS

2 Sheets-Sheet 2



INVENTOR.

CHARLES E. SEARIGHT

BY

Phileas W. Fraser

ATTORNEY

1

3,018,704

STRIPE APPLICATOR FOR PAVEMENTS

Charles E. Searight, Jackson, Miss., assignor to Cataphote Corporation, Toledo, Ohio, a corporation of Ohio

Filed Dec. 15, 1958, Ser. No. 780,367

3 Claims. (Cl. 94-44)

This invention relates to pavement stripe applicators and, more particularly, to a machine for applying a stripe of hot thermo-plastic material to a roadway. This application is a continuation-in-part of my co-pending application Serial No. 604,989, filed August 20, 1956, for Apparatus for Applying Thermo-plastic Markers to Roadways, now Patent No. 2,875,675.

In applying a stripe of thermo-plastic material along a roadway, the material was previously dispensed from the bottom of a heated tank through an outlet valve and thence directly onto the roadway. In my co-pending application, supra, there is shown an unique burner arrangement, one burner for blasting a flame onto the roadway immediately in front of where the material is applied so that the material along the bottom of the stripe will not freeze too quickly and thus bridge over cracks and crevices in the pavement surface, and another burner for blasting a flame over the outlet valve so that the material won't thicken or freeze in the valve. The object now is to provide a road striper wherein hot thermo-plastic stream is dispensed from a heated tank through an outlet valve into a chute, and thence onto the roadway through a shoe. One of the objects is to control the outflow of striping material from the shoe, and also to arch the top of the stripe as it flows onto the roadway. To this end it is intended to provide a combined adjustable shoe gate and doctor blade. Another feature is the mounting of the chute so that it can be raised and lowered from the roadway. On the machine immediately behind the shoe is mounted a dispenser for sprinkling tiny glass beads on the then still tacky surface of the freezing stripe, the dispenser being driven by a ground-engaging wheel. A further object of the invention is to provide a combined manual control linkage for the chute, shoe gate and the power drive for the bead dispenser so that whenever the chute is lowered, the dispenser ground wheel will be clutched against the roadway by one motion of the control handle so that the beads will be sprinkled as the machine is propelled along the roadway and then, by further motion of the control handle, the shoe gate is opened. By reverse motions of the control handle, the shoe gate is first closed by the first reverse motion and then the chute and ground-engaging dispenser wheel are simultaneously lifted. By these sequences of activating and de-activating the parts, complete sprinkling of the stripe with beads, from start to finish, is assured.

Another of the objects is the provision of a heater for directly heating the dispensing apparatus leading from the tank bottom to the ground, and for indirectly heating the material flowing therethrough. Accordingly, it is now proposed to provide a radiant heater, constantly operated, disposed to impinge its rays onto the dispensing valve at the bottom of the tank, onto the chute leading downwardly therefrom, and onto the shoe and combined shoe gate and doctor blade. Thus, all the dispensing apparatus will be pre-heated and kept hot, and the material itself is kept hot as it flows down the chute and out through the shoe.

Still another object is to ensure that the roadway immediately in front of the point of application of the stripe will always be pre-heated whenever the gate valve, which controls the flow of thermo-plastic material from the chute onto the roadway, is opened. Likewise, since the

2

roadway pre-heating burner blasts out a comparatively large flame, it is intended to save fuel by shutting it off whenever the gate valve is closed. The common control linkage for the roadway pre-heating burner and the gate valve also provides a safety factor which avoids accidental fire-setting, in that the pre-heating blast is started only when the material flows on the roadway.

These and other objects will be apparent from the following specification and drawings, in which:

FIGURE 1 is a side elevation of the applicator;

FIGURE 2 is a plan view of the applicator;

FIGURE 3 is a fragmentary view, showing in side elevation the dispensing valve, chute, combined chute gate and doctor blade and parts of the operating linkages therefor;

FIGURE 4 is a fragmentary plan view of the parts shown in FIGURE 3;

FIGURE 5 is a fragmentary cross section along the line 5-5 of FIGURE 3; and,

FIGURE 6 is a fragmentary rear elevation of the bead dispenser as seen along the line 6-6 of FIG. 1.

Referring now to the drawings, in which like reference numerals denote similar elements, the stripe applicator 2 has a sheet metal casing 4 supported on two non-swiveling forward wheels 6 and a non-swiveling rear wheel 7 so that the applicator maintains a generally straight course when trundled along a roadway R. The applicator may be tipped forwardly so that it rests on the two forward wheels 6 and a pair of raised rollers 8 at the front of casing 4, the relatively short wheel base then permitting a sharp angle turn. Ordinarily, the flow of striping material is cut off when the machine is tipped forwardly but, when a misaligned segment of the road, such as a gutter pan, is encountered, rollers 8 may be used for supporting the machine while laying the last few inches of stripe prior to cut off.

A material supply tank 10 is housed within casing 4 and a pressure type tank burner, not shown, is provided for keeping the stripe material hot, in a thick liquid state. The tank burner is supplied with gas from a tank housed in a fuel compartment 12 in the rear of casing 4. Also fed with gas from the fuel compartments are a pre-heating burner 14 which, when on, blasts a flame downwardly onto the roadway R, and a radiant heater 16, normally on, and disposed to project its rays onto the material dispensing mechanism detailed hereinbelow. The temperature of material within the supply tank is indicated on a gauge 18 and fuel valves 20, 22 and 24 control the supplies of gas to the tank burner, to a pilot flame for pre-heating burner 14, and to radiant heater 16. Also, there is an open-shut valve 26 in the rear end of the fuel supply line 28 leading to pre-heating burner 28, valve 26, normally shut, being opened by tensioning spring 29 as later detailed.

Referring to the right-hand portions of FIGURES 1 and 2, it will be observed that pre-heating burner 14 is housed within a hood assembly 32 attached on the front of a transverse supporting plate 34. A flap baffle 36 pivoted at 38 on the lower rear side of the hood assembly prevents the flame from pre-heating burner 14 from blasting rearwardly under the dispensing mechanism.

In the top of casing 4 is a door 40, through which molten material is supplied to tank 10 from a suitable pre-heating boiler, the material within the tank being stirred from time to time by rotating a stirring handle 41 connected to a stirrer 41', indicated by dash lines in FIG. 1, within the tank. Stripe applicator 2 is designed for using one of the various thermo-plastic resins which, when cool, freezes hard. The invention is concerned primarily with the material dispensing mechanism per se and in combination with the radiant heater, and the inter-related control mechanisms detailed below.

As shown best in FIGURES 1, 3, 4 and 5, a discharge chute 42 is pivoted at 44 to supporting plate 34, the chute lower end terminating in a road-engaging shoe 46. A combined shoe gate and doctor blade 48 pivoted at 50 across the top of chute 42 is formed with a downwardly concave lower edge 49 so as to strike an arched top on the material extruding therefrom, it being understood that the gate may be closed against the lower rear wall of chute sufficiently to prevent any outflow of the thick, viscous plastic or it may be opened to varying degrees to provide stripes of varying thickness. The viscosity of the plastic is sufficient so that no appreciable amount will flow beneath the slight concavity of the lower edge of the doctor blade when the latter is closed, particularly when the chute is lifted so that its inclination is slight. Combined gate and doctor blade 48 is swung open and closed by crank arms 52 whose free ends are connected by a yoke 54 to the lower end of a rod 56 attached at its upper end to a lever 58. Lever 58 has a pivotal support 60 on the side of casing 4 and a handle 62 at its rear end. As shown in FIGURES 1 and 3, lever 58 is in an intermediate position, in which combined shoe gate and doctor blade 48 is closed and chute 42 is lowered so that shoe 46 rests on the roadway. By raising handle 62 clockwise from its intermediate position, rod 56 is forced downwardly from its full-line position of FIG. 3, thereby swinging crank arms 52 clockwise about pivot 50 so that the combined shoe gate and doctor blade 48 is opened to varying degrees, as illustrated by the dash lines in FIG. 3, depending on how far the handle is raised.

When it is desired to cut off the flow of striping material onto the roadway from chute 42, handle 62 is lowered to its intermediate position so that rod 56 returns to its full-line position of FIG. 3, whereupon the combined shoe gate 48 closes counter-clockwise about pivot 50 against the lower side of chute 42. Since the combined shoe gate and doctor blade 48 cannot swing counter-clockwise beyond its closed position, further lifting of rod 56, caused by swinging lever 62 downwardly from its intermediate position, swings chute 42 upwardly about pivot 44 to the position shown in broken lines in FIG. 3.

Tension spring 29, connected at its lower end to open-shut valve 26, is attached at its upper end to the handle side of lever 58. In the intermediate and lower positions of lever handle 62, valve 26 is shut and pre-heating burner 14 is off. However, clockwise movement of lever handle 62 from its intermediate position opens valve 26 and the gas from burner 14, ignited by a pilot, preheats the road at the same time the plastic material is permitted to flow onto the road.

Hot plastic material from tank 10 flows into chute 42 via material outlet pipe 64 and valve casing 66, the flow being controlled by a valve 68 pivoted at 70 to casing 66. Valve 68, which is capable of controlling the flow of thick viscous liquids of molasses-like consistency, is pivoted at 72 to the lower end of a rod 74. The upper end of rod 74 is connected to the forward end of a control lever 76 supported on pivot 78 and having a handle 80 on its rear end. Lowering and raising of handle 80 opens and closes molasses valve 68 to varying degrees.

An apron 82, beneath which radiant burner 16 is mounted, extends rearwardly from plate 34, and is supported at its rear by braces 84 connected to a bracket arm 86. A glass bead dispenser 88 is supported by pivots 90 on arm 86 and contains a rotary distributor mounted on and driven by a shaft 92. Tiny glass beads fed by gravity to dispenser 88 via feed pipe 94 from supply hopper 96 are spread onto the stripe behind shoe 46 by the distributor when shaft 92 rotates. Shaft 92 has on its inner end a sprocket 98 driven by chain 100 from a sprocket, not shown, on a stub shaft 104 rotatably supported on an arm 106 mounted on and extending rearwardly from dispenser 88. A wheel 108 on the inner end of the stub shaft is pressed against the ground through

a compression spring 110 engaged between the rear ends of arm 106 and a lever 112 pivotally supported at its front end on dispenser 88. As shown in FIGURE 1, a link 114 is pivoted at its lower end 116 to lever 112 and at its upper end 118 to lever 88.

In operation, applicator 2 is pushed along a roadway R by handle 120. Shortly before a stripe is to be started, handle 62 is raised to the intermediate position shown in FIGURE 1 so as to lower chute 42 from its dotted line position (FIGURE 3) to its full line position, wherein shoe 46 rests on the road. Handle is then pushed down so as to open molasses valve 68 enough to start the material down chute 42 which, along with outlet pipe 64, valve casing 66, molasses valve 68, shoe 46 and gate 48, was pre-heated by the radiant heater 16. Molasses valve 68 is then temporarily closed, and lever 62 is raised to its upper dotted line position (FIGURE 1) so as to open the combined shoe gate and doctor blade 48, press wheel 108 against the roadway and start pre-heating burner 14. At this point, the operator starts pushing the applicator along, and re-opens molasses valve 68 sufficiently to permit a continuous flow of material into the shoe, the molasses valve being opened to greater or lesser degree to maintain a constant supply of material, depending on the width of the stripe and the speed of propulsion.

A few feet prior to the end of the line, molasses valve 68 is closed so that most of the material in chute 42 and shoe 46 will run out by the time the stripe is to be ended. At the end of the stripe, the rear end 62 of lever 58 is swung down beyond its full line position (FIGURE 1) so as first to close the combined shoe gate and doctor blade 48 and simultaneously shut off pre-heating burner 14. The first downward motion of the rear end of the lever relieves some of the pressure of spring 110 on wheel 100. Further downward motion of the lever lifts chute 42 upwardly while lifting the bead dispenser drive wheel 108 off the roadway. When chute 42 is lifted off the highway, the major part of it and shoe 46 are disposed comparatively close to radiant heater 16. Thus the chute and related parts are thoroughly pre-heated prior to the start of a stripe, and they are kept well heated between striping operations.

The invention is not limited to the details described and illustrated herein, but is intended to cover all substitutions, modifications and equivalents within the scope of the following claims.

I claim:

1. In a stripe applicator for pavements, a tank adapted to contain stripe-forming material, outlet means for said tank, a discharge chute having input and output ends, a pivot mounting said input end of said chute adjacent the outlet means of the tank for receiving said material therefrom, the output end of said chute being vertically swingable about said pivot between lowered and raised positions, a gate for closing the chute, a pivot means pivotally mounting the gate on said chute adjacent the output end thereof, a lever rigid with said gate and swinging therewith about said pivot means, a control member movably mounted on said applicator and being movable between lower, intermediate and upper positions, and means connecting said control member to the end of said lever to swing the gate from open to closed position when said operating member is moved from said lower to said intermediate position and whereby further raising of said control member from said intermediate position to said upper position swings the output end of the chute upwardly about said pivot from said lowered position to said raised position.

2. The combination claimed in claim 1 said gate comprising a plate having a free edge remove from said fulcrum, said free edge being concave whereby to strike an arched top surface on the material issuing from the output end of the fulcrum.

3. In the combination claimed in claim 1, a pre-heating

5

burner on said applicator disposed to blast a flame on the pavement in front of said chute, a fuel supply conduit for said pre-heating burner, a control valve in said conduit, and means connecting said operating member and said control valve for opening the latter upon movement of said operating member from said intermediate position to said lower position.

5

6

References Cited in the file of this patent

UNITED STATES PATENTS

2,076,370	Hollingshead	Apr. 6, 1937
2,241,863	Lett	May 13, 1941
2,420,410	Blankner	May 13, 1947
2,578,080	Middlestadt	Dec. 11, 1951