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2 Sheets-Sheet 1

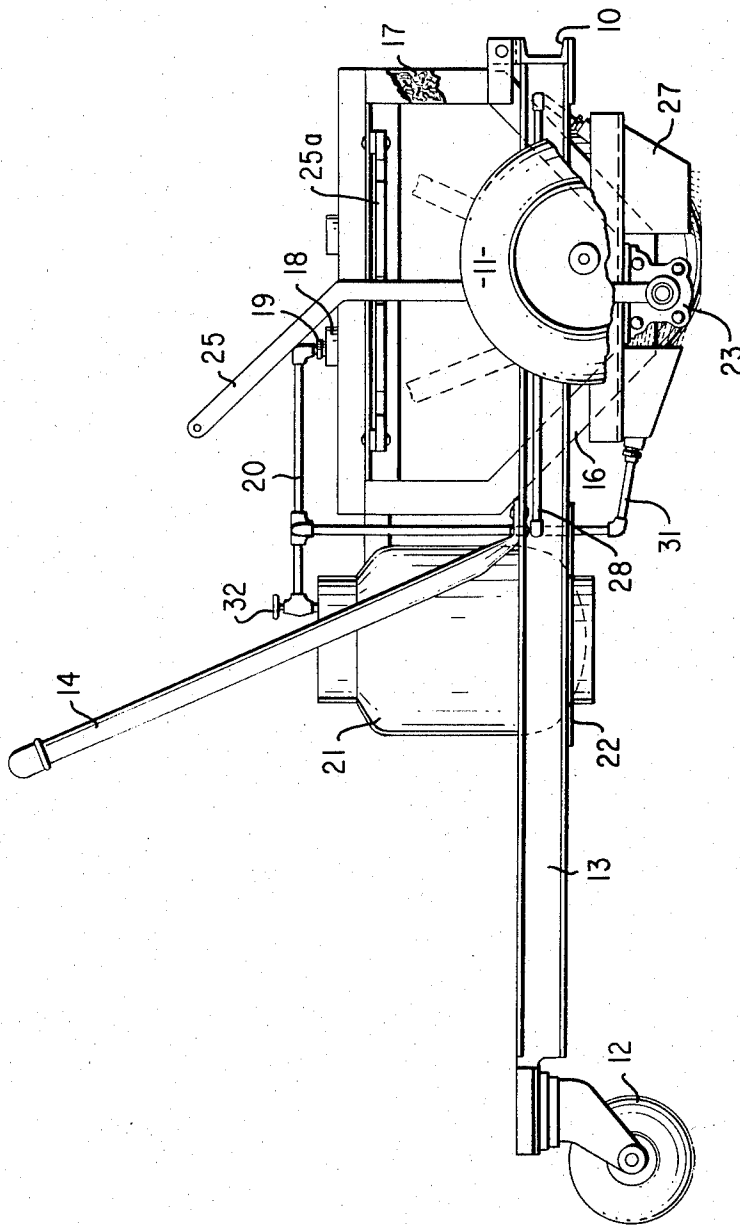


Fig. 1

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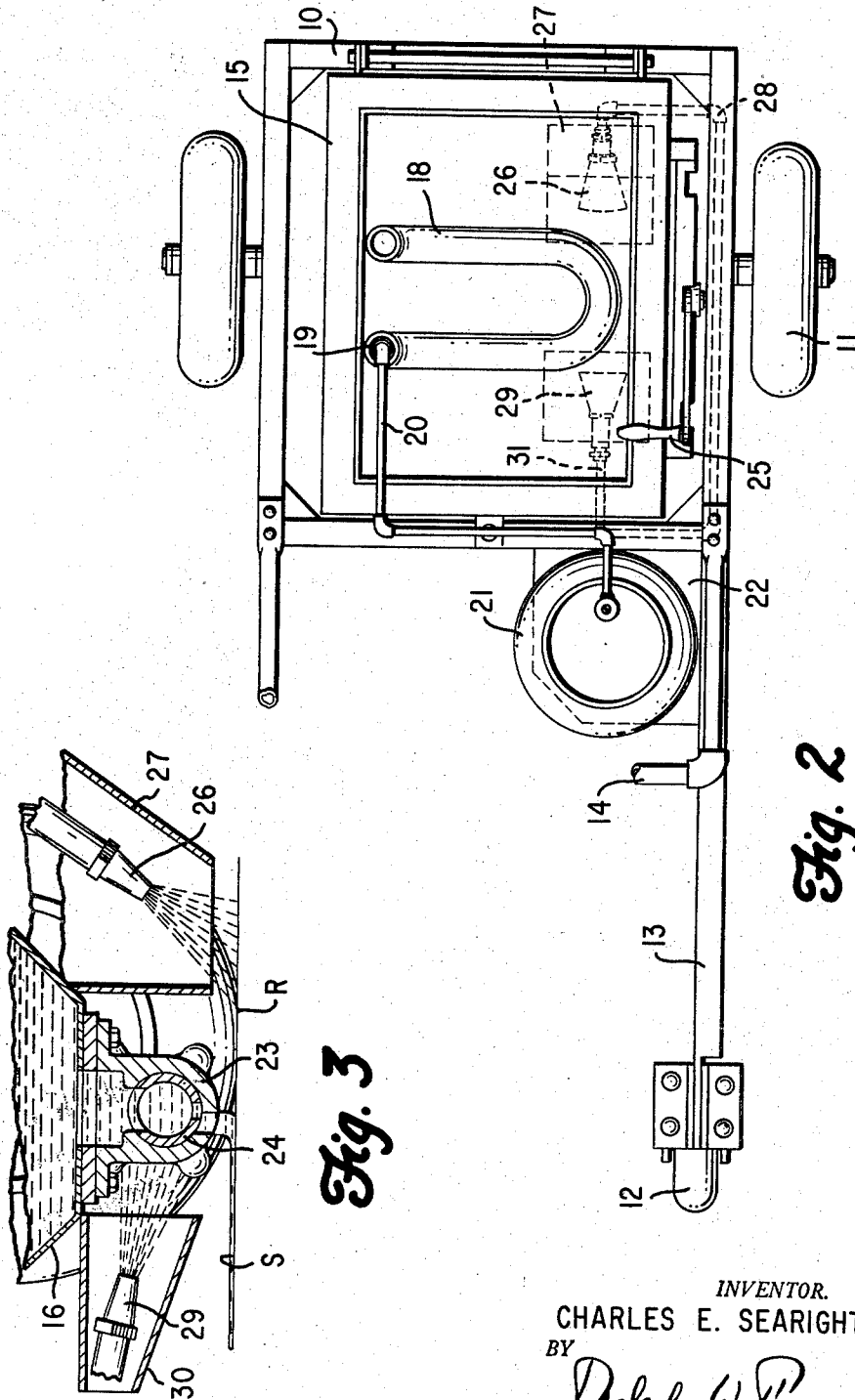


Fig. 3

Fig. 2

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1

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APPARATUS FOR APPLYING THERMOPLASTIC MARKERS TO ROADWAYS

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1 Claim. (Cl. 94—39)

This invention relates to roadway markers which operate in such manner as to lay on the roadway a ribbon of white, yellow or other color for traffic control purposes.

It is a desideratum to apply a ribbon of thermoplastic material, such, for example, as polystyrene or natural rosin, because of its greater toughness, resistance to abrasion, and for other reasons enabling it to continue its useful life for a much greater period and obviating the necessity of frequent replacement or touch-up.

Difficulty has been experienced in the use of such thermoplastics for this purpose because of the inability to effect the proper bond or adhesion between the material and the roadway. As a consequence, when hardened, such material not infrequently cracks so that it soon becomes useless for the purpose intended. Furthermore, since the cost of thermoplastic materials is substantially greater than the paint ordinarily used for roadway marking, thermoplastics have not been used to any great extent.

An object is to overcome the above difficulty and to produce a novel and efficient method for applying thermoplastics to a roadway for traffic control in such manner that an effective bond is achieved between the material and the roadway, and cracking of the material after it has set up is eliminated.

Another object is to produce a simple and improved apparatus for carrying out the above method.

For purposes of illustration but not of limitation, an embodiment of the invention is shown on the accompanying drawings, in which

Figure 1 is a side elevation of an ambulatory roadway marker in accordance with the invention;

Figure 2 is a top plan view of the apparatus shown in Figure 1; and

Figure 3 is an enlarged fragmentary detailed view showing the manner in which the roadway is heated directly in advance of the valve controlled passage through which the fluid thermoplastic flows upon the roadway.

The illustrated embodiment of the invention comprises a roadway marking apparatus having a substantially rectangular frame 10 of U beams or the like supported on a pair of rubber-tired wheels 11, disposed respectively on opposite sides of the frame. At one side of the frame and rearwardly thereof is a caster wheel 12 mounted on an extension 13 of the frame. The apparatus is hand-propelled and for this purpose, a bail-like handle 14 has its lower ends suitably secured to the frame and the upper cross portion of the handle being suitably positioned so that the operator can walk in rear of the apparatus and push it along.

Suitably secured within the apparatus frame 10 is a container 15, the upper portion of which is generally rectangular in cross section and the lower portion of which tapers downwardly in a funnel-like manner 16 to provide an outlet in the region of the surface of the

2

roadway, as will hereinafter appear. The container 15 is double-walled, and between these walls is suitable insulation 17, such as glass fibers or the like, for effecting the desired thermal insulation. A removable top panel 5 closes the upper end of the container, and for keeping the thermoplastic material within the container in a fluid state, a tube 18 covers a substantial portion thereof in a serpentine-like manner, with the free ends of the tube projecting upwardly through the closure for the top of the container. Heat is forced into the tube 18 by a burner 19 which extends into one of the open ends of the tube 18, the exhaust gases being allowed to pass into the atmosphere from the other open end of the tube. Gas is supplied to the burner 19 from a pipe 20 10 which connects to a gas tank 21 suitably mounted in vertical position on a platform support 22 rigid with the frame.

The funnel-shaped bottom end 16 of the container has an outlet registering with a valve housing 23, the lower end of which is disposed slightly above the roadway R (see Figure 3). The housing 23 has an outlet with which an outlet port of a rotary valve 24 is adapted to register. The valve 24 may be rotated to and from open position by an operating lever 25 which extends 25 upwardly and rearwardly as indicated on Figure 1, so as to be conveniently manipulated by the operator. A notched strip 25a on the side of the container is arranged so that the handle 25 may be sprung into one or another notch to hold it either in its open or closed position as desired.

Slightly in advance of the valve housing 23 is disposed a downwardly and rearwardly inclined burner nozzle 26 30 which, as indicated on Figure 2, flares outwardly at its lower end in order to direct a fan-shaped flame directly upon the surface of the roadway R and of a width approximating that of the ribbon to be laid upon the roadway. The burner 26 extends into a shield or housing 27, the lower end of which is spaced slightly above the surface of the roadway. Gas is supplied to the burner 26 40 by a branch pipe 28 which, as shown, joins the pipe 20.

In order to assist in maintaining the thermoplastic material in the desired fluid state, another burner 29 directs its flame against the rear of the valve housing 23. This burner is disposed within a suitable shield or housing 30 45 carried by the frame. A branch pipe 31 connects to the burner nozzle 29 and in this instance is connected to the branch 28. A hand control valve 32 which is disposed adjacent the tank 21 in this instance controls the flow of gas to all of the burner nozzles.

It will be understood that as the apparatus is pushed forwardly by the operator, the thermoplastic flows through the valve 24 and the outlet from the valve housing 23 and is deposited in ribbon form upon the roadway R, as indicated at S in Figure 3. The width of the orifice 50 in the valve housing and valve is such as to obtain a ribbon S of the desired width. The flow of material can be readily controlled by manipulating the valve operating arm 25.

An important feature of this invention resides in directing the flame upon the roadway in advance of the ribbon and of such intensity that all or practically all surface moisture is driven from the roadway. This contributes substantially to obtaining a satisfactory bond between the thermoplastic and the roadway. Additionally, by heating the roadway in this manner, premature setting up of the hot thermoplastic material is prevented. The thermoplastic material enters the interstices and irregularities in the roadway so as to provide a smooth and uniform ribbon. Since the material enters all of these small depressions, 60 holes and irregularities in the roadway, cracking of the material is obviated, particularly since there is no bridg-

ing by the material. Empirically it is found that by applying the thermoplastic ribbon in this manner, an extremely satisfactory bond is achieved and the material will stand up for an extended period of time without cracking, chipping or coming loose from the roadway.

Numerous changes in details of construction, arrangement and choice of materials may be effected without departing from the spirit of the invention, especially as defined in the appended claim.

What I claim is:

Apparatus for applying a rapidly freezing thermo-plastic material for roadway marking purposes and the like, comprising an ambulatory support including a chassis having ground-engaging wheels on respectively opposite sides thereof, a container disposed between said wheels on said chassis, a gaseous fuel burner having a manifold disposed in said container for heating said thermo-plastic material disposed therein, said container having a downwardly tapering lower portion formed of a downwardly and rearwardly inclined front wall and a downwardly and forwardly inclined rear wall, said lower portion terminating in a bottom wall having an outlet opening therethrough, a valve casing depending from said bottom wall, said valve casing having an inlet opening in the upper portion thereof communicating with the outlet opening through the bottom wall of the container, the lower portion of said valve casing being generally cylindrical and defining a cylindrical valve chamber with the cylindrical axis extending generally transverse of the chassis, the bottom of said valve casing lying closely adjacent a horizontal plane tangent to the bottoms of said wheels, a hollow cylindrical rotary valve disposed in said valve chamber, an outlet port through the bottom of said valve casing, the stream of material flowing through said outlet port lodg-

ing almost directly therefrom onto the roadway, said valve having diametrically opposed through-ports, means on the exterior of said valve casing for rotating said valve for selectively permitting and blocking the flow of material to said outlet port, a front gaseous fuel burner on said chassis, said front burner lying beneath the downwardly and rearwardly inclined front wall of the lower portion of said container and being disposed to direct a blast of flame directly downwardly onto the roadway immediately in front of the lower portion of said valve casing, the flame blast from said front burner occupying the area contiguous to and immediately in front of the bottom of said valve casing, and a rear gaseous fuel burner on said chassis, said rear burner lying beneath the downwardly and forwardly inclined rear wall of the lower portion of said container and being disposed to direct a flame blast downwardly and forwardly onto the rear side of the lower portion of said valve casing, a small portion of the last-named flame blast impinging on the stream of material from the valve outlet port substantially at the point of deposit thereof on the roadway, whereby the roadway contiguous to and immediately in front of the point of deposit, the valve casing, and the stream of material issuing from the outlet port are all enveloped in an environment of the flame blasts.

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