Jan. 6, 1959 H. A. TOULMIN, JR 2,866,992

ROAD MARKING APPARATUS

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Fig. 1.

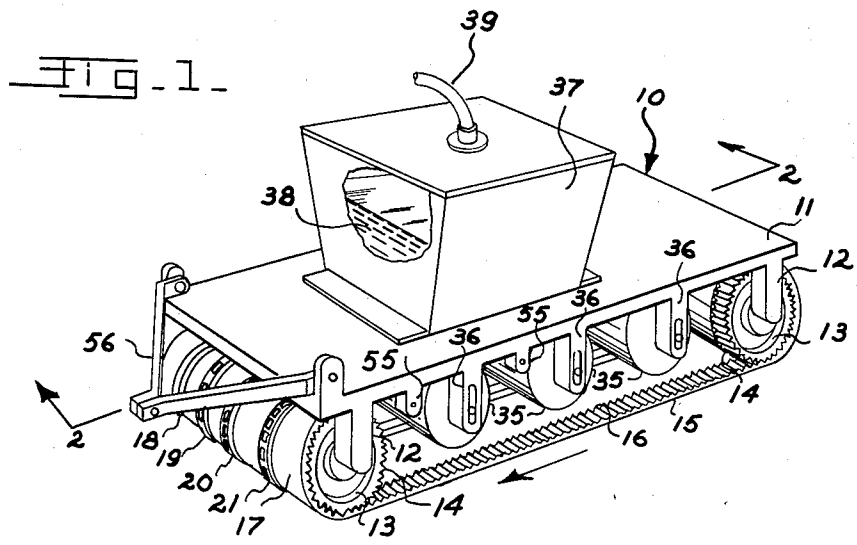


Fig. 2.

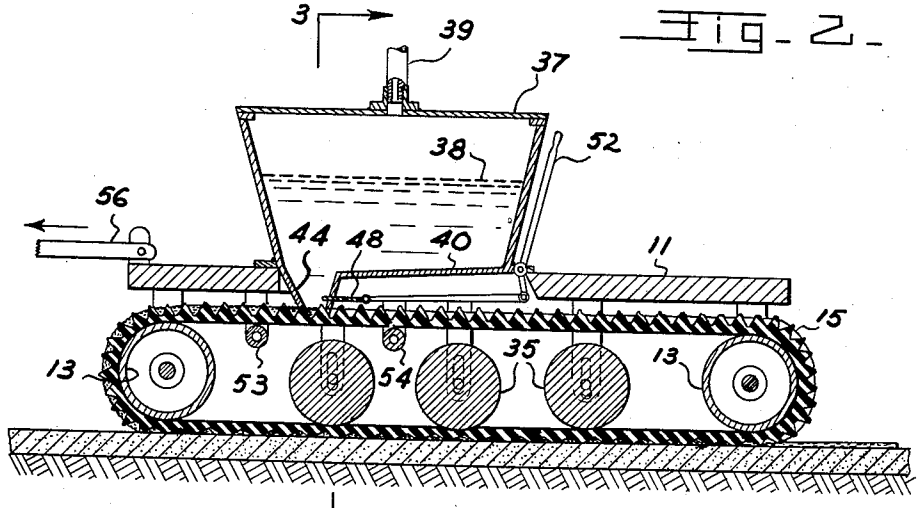
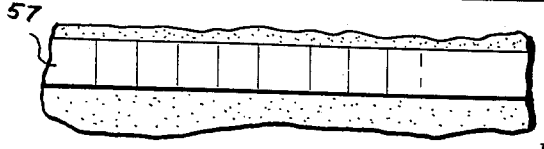


Fig. 7.



Fig. 8.



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Fig. 5

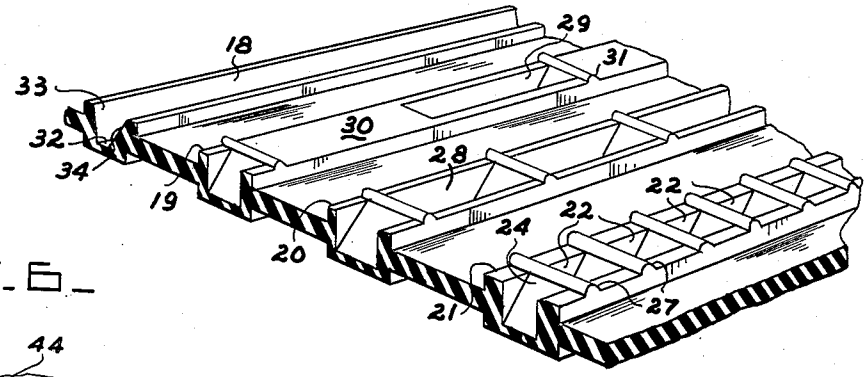


Fig. 6

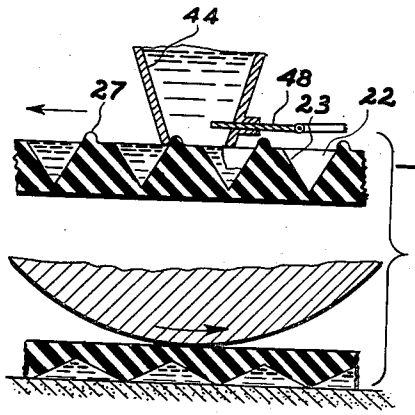
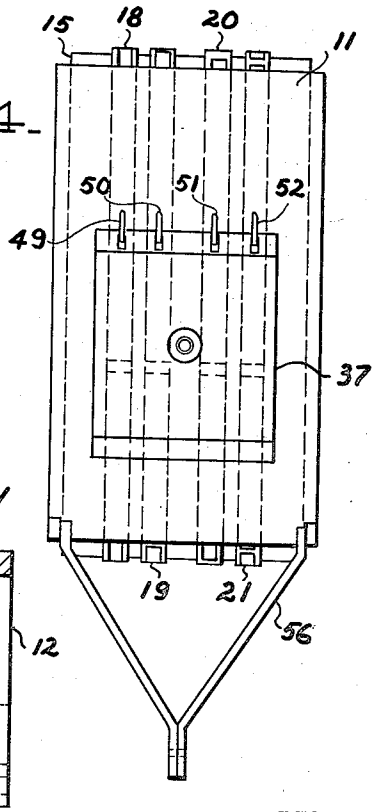


Fig. 4



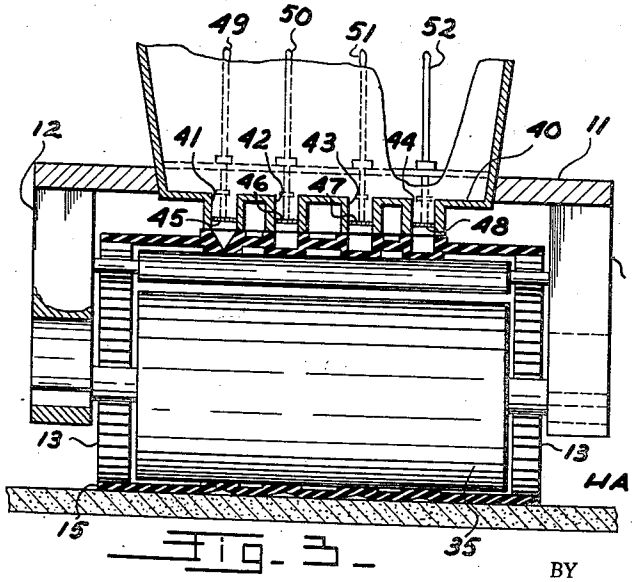


Fig. 3

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ROAD MARKING APPARATUS

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5 Claims. (Cl. 15—131.05)

The present invention relates to a road striper, more particularly to an improved apparatus for applying plastic paint to roads to result in varied forms of road markings.

The use of road markings to assist in the flow of traffic along the highways and city streets is becoming more common. On the open highway the traffic markings consist primarily of markings in the center of the road to indicate when it is permissible to pass another vehicle. In addition, other traffic markings may indicate unexpected conditions in the road ahead or to indicate which lanes should be used in order to turn at approaching intersections. On the city streets traffic markings are used to indicate lanes for traffic to take various turns and also to indicate pedestrian walks at intersections. Also traffic markings may take the form of signs on the roads to indicate the speed limit and approaching dangerous places in the road.

On the city streets, especially, it can be seen that the traffic markings must be able to withstand a heavy amount of traffic. Various forms of traffic markings have been proposed. The conventional traffic markings are made of paint and applied either by hand or by machine, whichever is more economical. Some municipalities have experimented with the use of permanent plastic discs as traffic markings. However, after some use it was found that these traffic discs were badly damaged due primarily to the use of snow plows and other heavy equipment rather than to the heavy flow of traffic. In addition, various luminous paints have been proposed in order to form traffic markings which may be clearly seen at night or under other conditions when the visibility is bad.

Recently several plastic compounds have been developed which are in the nature of plastic paints. These plastic paints are quite viscous and, hence, cannot be applied with ordinary apparatus. Attempts made to apply this plastic paint by means of brushes have invariably proved to be unsuccessful. In addition, these new plastic paints dry quite quickly and this characteristic again precludes their being applied by conventional apparatus. However, trials have shown that these plastic paints form satisfactory traffic markings and future tests are expected to indicate that traffic markings of plastic paints are acceptable.

The present invention discloses an apparatus especially adapted to apply these plastic paints to a road in order to form traffic markings thereon. As the conventional brush applicator has proven to be unsuccessful, the apparatus of this invention is a wholly new principle in applying plastic paints.

The apparatus disclosed in this invention comprises a road striper which deposits quantities of plastic paint in a predetermined pattern. These quantities of plastic paint are spread or smeared upon the surface of the road to form the desired traffic markings. Furthermore, with this road striper various forms of traffic markings may be simultaneously or periodically applied without interrupting the operation of the apparatus. Not only

may the conventional markings of solid stripes and dash lines be applied, but, in addition, letters, numerals and other symbols may also be applied to roads.

The road striper of this invention essentially comprises a resilient endless track which moves upon the road surface. The endless track is supported beneath a platform upon which is mounted a hopper which has therein a supply of the plastic paint. Formed integrally with the road engaging surface of the endless track is a longitudinally extending projection which has therein a series of spaced recesses. These recesses are preferably V-shaped but may have the shape of truncated pyramids. Consequently, after a quantity of plastic paint is deposited in a recess, the recess will carry the paint around to the surface of the road and upon contact with the surface of the road the inclined walls of the recess will tend to spread open under the weight of the road striper. This spreading open of the recess will result in the paint to pass from the recess and be deposited on the road. Means are then provided on the projection in order to sufficiently spread the deposited plastic paint to form the desired marking. The road striper may be either self-propelled or towed by a suitable vehicle.

It is therefore the principal object of this invention to provide an improved road striper.

It is another object of this invention to provide a novel apparatus for applying plastic paint to form road markings.

It is a further object of this invention to provide an apparatus for applying plastic paint to roads to form solid or dash lines thereon.

It is an additional object of this invention to provide a simplified apparatus for inexpensive and rapid marking of traffic lines on roads.

It is still another object of this invention to provide an apparatus for simultaneously applying different traffic markings on roads.

It is a still further object of this invention to provide an apparatus for successively applying different markings to roads without interrupting the operation of the apparatus.

Other objects and advantages of this invention will become readily apparent upon reference to the following description when taken in conjunction with the accompanying drawings wherein:

Fig. 1 is an over-all perspective view of the road striper disclosed as this invention;

Fig. 2 is a sectional view taken along the lines 2—2 of Fig. 1;

Fig. 3 is a sectional view taken along the lines 3—3 of Fig. 2;

Fig. 4 is a top plan view of the road striper illustrated in Fig. 1;

Fig. 5 is a perspective view of a portion of the endless track showing retails of the structure thereon;

Fig. 6 is a detailed view in enlarged scale of a portion of Fig. 2 showing the manner in which the stripe material is supplied to the endless track and the manner in which the material is applied to the surface of the road;

Fig. 7 is a side elevational view of the quantities of plastic paint deposited to form a solid line; and

Fig. 8 is a top plan view of the paint deposits shown in Fig. 7.

Returning now to the drawings, more particularly to Fig. 1 wherein like reference symbols indicate the same parts throughout the various views, **10** indicates generally the road striper constructed in accordance with the teachings of this invention. The road striper **10** comprises a platform **11** which is substantially rectangular in shape. The platform **11** serves as the base and frame

for the road striper. A pair of roller supports 12 depend from each end of the platform 11. A roller 13 is journalled within each pair of roller supports. There are teeth 14 around each end of roller 13. An endless track 15 is carried by the rollers 13. The track 15 has teeth 16 on each edge thereof which engage the teeth 14 of each roller 13. The endless track 15 has a road engaging surface 17 moving upon the surface of the road.

On the road engaging surface 17 of the endless track 15 are four longitudinally extending projections 18, 19, 20 and 21. The exact structure of these projections may be seen more clearly in Fig. 5. Each of the projections 18 through 21 are preferably integral with the endless track 15. Each of the longitudinally extending projections has a somewhat different structure, the purpose of which will be explained later. However, the concept as taught by this invention is embodied in projection 21 and, consequently, this projection will be described in detail.

By examining projection 21, it can be seen that there is a series of recesses 22 therein. Each of the recesses is substantially V-shaped. Each recess 22 has opposed transverse walls 23 and 24 which are inclined inwardly into the recess to form a V. There is a transverse projection 27 associated with each recess 22 and the transverse projection 27 extends across the entire width of the longitudinally extending projection 21.

Again referring to Fig. 5 it can be seen that the longitudinally extending projection 20 also comprises a series of recesses 28 which have inwardly inclined walls. However, recesses 28 are shown to be somewhat longer in length than the recesses 22.

Longitudinally extending projection 19 has recesses 29 which are spaced from each other by means of a solid portion 30. Each recess 29 has a transversely extending projection 31 associated with it similar to the manner described with longitudinally extending projection 21.

Longitudinally extending projection 18 comprises an uninterrupted groove 32 therein which has longitudinal walls 33 and 34 inclined to form a V transversely of the projection 18.

Returning now to Figs. 1 and 2 it can be seen that a number of pressure rollers 35 are mounted from supports 36 which extend downwardly from the longitudinal edges of the platform 11. The pressure rollers 35 are of considerable weight and engage the inner surface of the endless track 15 in order that the road engaging surface 17 of the endless track may exert an evenly distributed pressure upon the surface of the road. In addition, the pressure rollers 35 serve to maintain the endless track into close engagement with the road surface.

Mounted upon the platform 11 is a paint hopper 37. Paint hopper 37 contains a supply of plastic paint indicated at 38. A pressure line 39 leads to the paint hopper 37 in order to maintain the interior of the paint hopper under pressure at all times. The interior of the paint hopper is under pressure in order to assist in the flow of plastic paint from the hopper. This assistance may be necessary because the plastic paint has such a high degree of viscosity that it will not flow of its own accord with any marked degree of movement. The pressure line 39 is connected to a suitable source of pressure which may either be mounted upon the platform 11 of the road striper or on the vehicle which is towing the road striper.

The paint hopper 37 has a bottom surface 40 which has flow passages 41, 42, 43 and 44 therein. Each of the flow passages 41 through 44 is positioned in the bottom surface 40 so that each passage is aligned with cooperating projections 18 to 21 on the endless track. Each one of the flow passages has a closure member 45 through 48, respectively, which is actuated by means of a hand lever 49 through 52, respectively. Each of the closure members may be operated individually or simultaneously as may be desired. A pair of pressure rollers 53 and 54 are journalled in supports 55 which depend from the platform 11. The pressure rollers 53 and 54 are positioned both forwardly and rearwardly of the flow passages 41 through 44 in such a manner that the pressure rollers are in contact with the inner surface of the endless track so as to urge the longitudinally extending projections on the endless track into close engagement with the flow passages of the paint hopper.

Suitable means 56 are mounted upon the front of the platform 11 in order that the road striper may be towed. However, the road striper may be self-propelled by mounting a suitable prime mover upon the platform 11 and drivingly connecting the prime mover with one of the rollers 13.

With the described structure of the road striper in mind, the operation of the road striper will now be explained. In order to make a solid line with the road striper either one of the projections 18, 20 or 21 may be used. The specific projection to be used will depend largely upon the exact viscosity of the plastic paint employed. By way of illustration, however, the explanation will be given in connection with projection 21.

When the road striper has been positioned upon the road so that the projection 21 is in alignment with the spot on the road where the solid stripe is to be painted, the road striper is set in motion by suitable means. Sufficient pressure is set up within the paint hopper 37 in order to induce the flow of the plastic paint through the flow passage 44. The hand lever 52 is then manipulated and the closure member 48 is withdrawn in order to provide an uninterrupted passage through the flow passage 44. The pressure in the hopper will then cause the plastic paint to flow into the recesses 22. This action is best illustrated in Fig. 6. The transverse projections 27 are associated with each of the recesses 22 so as to prevent an excess of plastic paint from flowing upon the endless track. As the recesses filled with plastic paint bend around the front roller 13, the paint will not flow therefrom because of both the speed of the road striper and the fact that the paint is viscous. As the recesses filled with paint come into contact with the surface of the road, the recesses will spread apart in the manner indicated in Fig. 2 and Fig. 6. This will result in the quantity of paint in each recess being deposited upon the surface of the road. In addition, the smearing action of each of the transverse projections will serve to spread the quantities of paint in such a manner that a solid stripe will be formed. This smearing action is due in part to relative motion of the track and the road and also because of the resiliency of the track. The deposited paint and the resultant stripe are shown at 57 in Figs. 7 and 8.

It is pointed out that the V-shaped recesses are adapted to spread open to the extent illustrated in Fig. 6. Any further spreading wherein the recess would become substantially flattened would cause an undesired smudging of the paint which would result in blurred markings. Consequently, the resilient track and the recesses therein should be flattened to about one-half of their original height.

The action of the projections 18 and 20 is similar. It is pointed out, however, that in the case of projection 18 a constant quantity of plastic paint is deposited on the road as the road striper moves along the road. This is somewhat different from the intermittent quantities of paint which are deposited upon the road by the use of the projections 20 and 21. It is contemplated the projection 18 will be used for a plastic paint which is of the highest viscosity in respect to plastic paints.

If it is desired to produce a dash line, then the projection 19 would be used. It is at once seen that by using projection 19, paint would be deposited only in the recesses 29 as the solid portions 30 between each of the recesses would be in intimate contact with the flow passage 42, thereby preventing the deposit of any paint upon

the solid portion. Consequently, as projection 19 came in contact with the surface of the road, the result would be to produce a dash line.

In some jurisdictions it is desired to use both solid and dash lines to convey different messages to the drivers. In this event projection 19 could be used with either projection 18 or 20 by proper manipulation of the respective hand levers.

It is pointed out that this road striper is not limited to producing solid and dash road markings. By substituting a properly designed endless track, it is possible to paint letters, figures and other symbols on the road by depositing a plastic paint thereon. In each instance, however, the principle of operation would be the same, namely, the weight of the vehicle upon that portion of the endless track engaging the surface of the road would cause the substantially V-shaped recesses to spread and thereby to deposit paint upon the road surface.

Thus it can be seen that the present invention disposes a novel apparatus for depositing plastic paint upon the road surfaces or the like. This apparatus completely eliminates the use of brushes to paint markings on roads. In addition, the quantites of paint which are deposited upon the road surface may be carefully measured and regulated by properly choosing an endless track having specific longitudinally extending projections made thereon. The width of the stripes to be painted can also be varied by properly selecting the width of the longitudinally extending projection. In spite of the fact that plastic paint is quite viscous and oftentimes will not flow of its own accord, it can be seen that the present invention provides a structure wherein there is a flow of plastic paint whenever so desired. In addition, it can be seen that the present invention provides for different markings to roads without interrupting operation of the apparatus. Because of its speed and simplicity of operation the road striper of this invention may be used on both city streets and the open highway. As the applying of plastic paint to the road surface does not depend upon the speed at which the apparatus is operated, it can be seen that the operating speed of the apparatus is dependent only upon conditions upon that particular road which is being marked.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions and, accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

What is claimed is:

1. A device for applying plastic paint to a road comprising a vehicle, means on said vehicle for retaining a supply of plastic paint, an endless track of resilient material supporting the vehicle, substantially V-shaped recesses in said track and adapted to spread on contact with the road to substantially one-half of their original height under the weight of the device, the said recesses being transverse to the path of said track, and means on said device for filling said recesses with plastic paint from said paint retaining means.

2. A device for applying plastic paint to a road comprising a vehicle, means on said vehicle retaining a supply of plastic paint, an endless track of resilient material supporting said vehicle for movement upon the road, a longitudinally extending projection upon the road engaging surface of the track, and a plurality of spaced recesses in said projection, means for supplying the plastic paint from said supply to said recesses, each of said recesses having at least one pair of opposed walls thereof inclined toward each other with said inclined walls being transverse to the path of said track to enable each recess to spread upon contact with the road under the weight of the device to deposit paint on the road.

3. A device for applying plastic paint to a road comprising a vehicle, means on said vehicle retaining a supply of plastic paint, an endless track of resilient material supporting said vehicle for movement upon the road, a plurality of longitudinally extending projections upon the road engaging surface of the track, a plurality of spaced recesses in each of said projections, each of said recesses having at least the transverse walls thereof inclined to enable each recess to spread upon contact with the road under the weight of the device to deposite paint on the road, and said recesses in respective projections being of varied forms in order to apply varied markings to the road, and means for selectively supplying the recesses of respective projections from the plastic paint retained in said supply means.

4. In a road striper employing plastic paint, a vehicle, an endless track of resilient material for moving upon the road and supporting said vehicle, a longitudinally extending projection upon the road engaging surface of the track, a plurality of spaced recesses in said projection, each of said recesses having substantially a V-shape to enable each recess to spread upon contact with the road under the weight of the road striper, hopper means on said vehicle above said track to deposit plastic paint in said recesses through a spout, and a transversely extending projection associated with each recess projecting above the surface of the longitudinally extending projection and engaging said hopper spout in turn to prevent an excess of paint being discharged into said recesses.

5. A road striper employing plastic paint comprising a platform, a hopper for plastic paint mounted thereon, a resilient endless track supported beneath said platform for moving upon the ground, a plurality of parallel longitudinally extending projections upon the road engaging surface of the track, a plurality of spaced recesses in each of said projections, each of said recesses having substantially a V-shape to adapt each recess to flatten to substantially one-half of its original height upon contact with the road under the weight of the striper, said recesses of each projection being of varied length in order to apply varied markings to the road, and means associated with said hopper to selectively supply plastic paint to the desired projection, and a transversely extending projection associated with each recess to wipe said hopper means.

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