



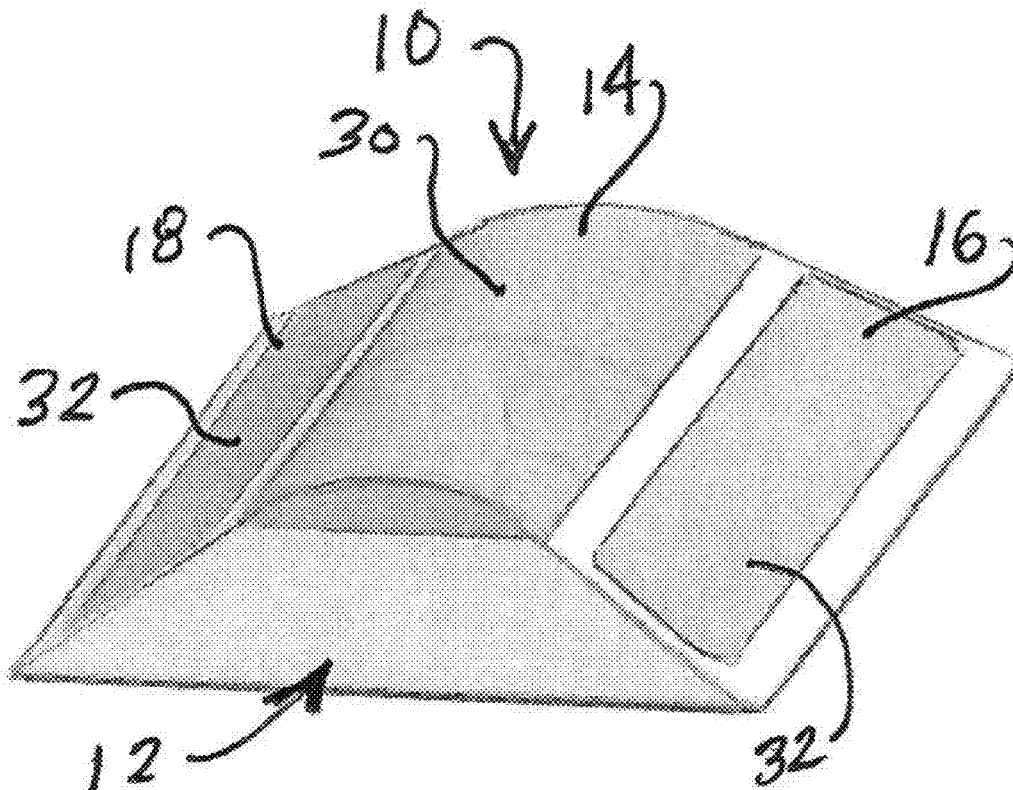
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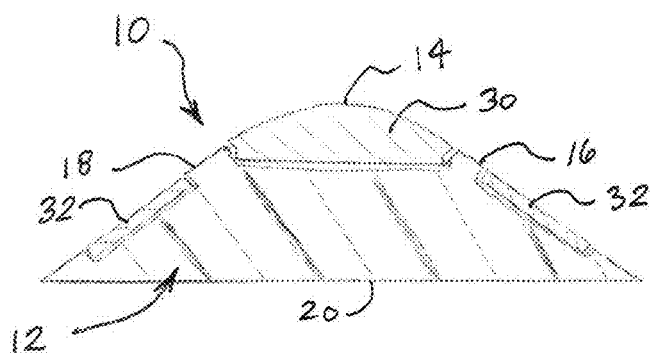
(19) **United States**(12) **Patent Application Publication**  
**Milano et al.**(10) **Pub. No.: US 2017/0022676 A1**(43) **Pub. Date: Jan. 26, 2017**(54) **LUMINESCENT RAISED ROAD MARKER****Publication Classification**(71) Applicants: **Michael L. Milano**, Boynton Beach, FL (US); **Andrew Lee**, Fort Lauderdale, FL (US); **ZhiQiang Liu**, Shanghai (CN); **Gang Li**, Shanghai (CN)(51) **Int. Cl.**  
**E01F 9/559** (2006.01)(52) **U.S. Cl.**  
CPC ..... **E01F 9/559** (2016.02)(72) Inventors: **Michael L. Milano**, Boynton Beach, FL (US); **Andrew Lee**, Fort Lauderdale, FL (US); **ZhiQiang Liu**, Shanghai (CN); **Gang Li**, Shanghai (CN)(57) **ABSTRACT**

A raised road marker is sized and configured to comply with Department of Transportation requirements and other government regulations and includes a top surface, opposite angled side faces and opposite ends and a bottom surface structured to be bonded to a road surface. The raised road marker is partially or entirely formed of rare earth materials to provide a luminescent property that emits a highly visible glowing light in dark or near dark conditions and environments. In a preferred embodiment, the raised road marker is molded of a plastic composition or other suitable composition and includes one or more inserts or coatings of the rare earth materials on the top side as well as possibly the opposite ends. The opposite angled sides may be fitted with light reflector strips.

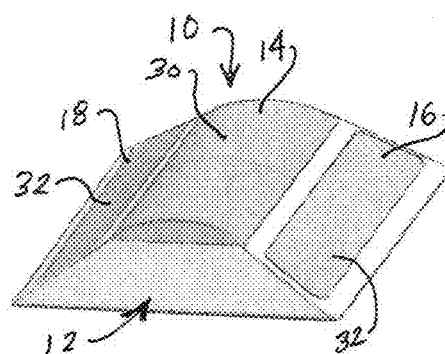
(21) Appl. No.: **15/142,855**(22) Filed: **Apr. 29, 2016****Related U.S. Application Data**

(60) Provisional application No. 62/154,185, filed on Apr. 29, 2015.

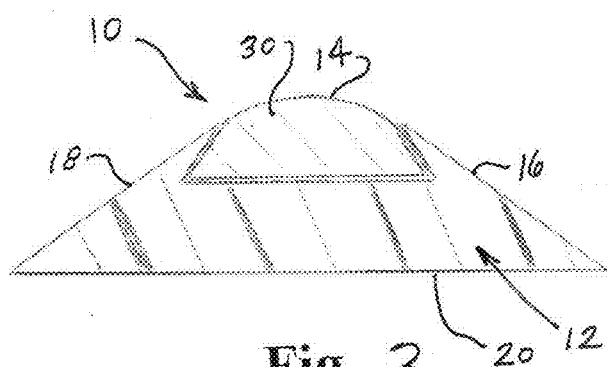




**Fig. 1**



**Fig. 2**



**Fig. 3**

## LUMINESCENT RAISED ROAD MARKER

[0001] This non-provisional patent application is based on provisional patent application Ser. No. 62/154,185 filed on Apr. 29, 2015.

### BACKGROUND OF THE INVENTION

[0002] Field of the Invention

[0003] The present invention relates to raised road markers and, more particularly, to a raised road marker that is at least partially formed of one or more rare earth materials to provide luminescent qualities in dark or near dark environments.

[0004] Discussion of the Related Art

[0005] Raised road markers, also referred to as raised pavement markers, are used as safety devices on roads to indicate lanes separation of opposing traffic lanes, location of fire hydrants, access for emergency vehicles, closed traffic areas or wrong direction of vehicle travel (i.e., "Do Not Enter" or "Wrong Way"). Other names for raised road markers include road studs, road cubes, road turtles or simply reflectors. Raised road markers are typically molded of a durable plastic material and commonly have two angled edges facing drivers approaching from opposite directions. These angled edges or angled side faces are commonly fitted with reflector strips to enhance visibility of the raised pavement markers, particularly at night. The reflectors may be of various colors to indicate such things as proper direction of travel or closed traffic areas. For instance, when used for lane markings, the opposite angled faces of raised road markers may be fitted with a white or yellow reflector on one side to indicate proper direction of travel and a red reflector on the opposite angled face to indicate "Wrong Way" direction of travel.

[0006] At night, visibility of raised road markers largely depends on use of headlights from approaching vehicles. In some instances, particularly for lane dividers, raised road markers may not always be clearly visible at night. Accordingly, there is a definite need for a raised road marker that is formed at least partially of a luminescent material that enhances the visibility of the raised road marker in dark conditions.

### SUMMARY OF THE INVENTION

[0007] The present invention is directed to a raised road marker that is formed at least partially of a luminescent material that emits a glowing light during dark and dim light conditions. In a preferred embodiment, the luminescent material is comprised of one or more rare earth materials that are adapted to be quickly charged with light energy from the sun or headlights of approaching vehicles and to emit a luminescent glowing light for an extended period of time. In particular, the present invention proposes to provide one or more inserts formed of rare earth materials within raised road markers to enhance visibility at night. This may include an insert that fits to the top of the raised road marker and forms the top surface of the raised road marker, which may be either flat or rounded, such as a dome shape. The one or more inserts may also be provided on opposite front and rear faces of the raised road markers. Alternatively, the rare earth materials may be applied by coating surfaces of the molded raised road marker. In another embodiment, the entire raised road marker may be molded of one or more rare earth materials.

[0008] The rare earth elements and composite materials used in the raised road marker of the present invention include, but are not limited to, photoluminescent materials such as aluminate photoluminescent pigment, silicate photoluminescent pigment and nitrides photoluminescent pigment.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Referring to the several views of the drawings:

[0010] FIG. 1 is a side elevational view of a raised road marker, shown in cross-sectional, illustrating one embodiment of the present invention;

[0011] FIG. 2 is a top perspective view showing the raised road marker of the present invention, in accordance with one embodiment thereof; and

[0012] FIG. 3 is a cross sectional view of another embodiment of the raised road marker of the present invention, wherein an insert is formed for receipt within a dove tail shaped transverse slot so that the insert, formed of one or more rare earth materials, is held within the road stud and forms a rounded or dome shaped top surface that is visible at night from all directions of approach.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] The raised road marker of the present invention is shown throughout the several views of the drawings and is generally indicated as **10**. In each of the embodiments, the raised road marker **10** includes a main body **12** having a top surface **14**, a front face **16**, and opposite rear face **18** and a bottom side **20** that is structured and disposed to be secured to a ground surface, such as a road surface, with appropriate adhesives that are commonly used for securing raised road markers to ground surfaces, such as asphalt, pavement, cement and the like.

[0014] In one embodiment, not shown in the drawings, the entire main body **12** of the raised road marker **10** may be formed of a luminescent material comprising one or more rare earth materials that are adapted to be quickly charged with light energy from the sun or headlights of approaching vehicles and to emit a luminescent glowing light for an extended period of time.

[0015] In the several embodiments shown in FIGS. 1-3, the raised road marker **10** of the present invention comprises a main body **12** formed of a molded plastic material or other suitable composition that is durable and can withstand the harsh environment of an outdoor road surface, is exposed to extreme weather conditions, sunlight and heat, and heavy vehicle traffic. The embodiments of the raised road marker shown in FIGS. 1-3 further include at least one insert formed at least partially of a luminescent material. In a preferred embodiment, the luminescent material is comprised of one or more rare earth materials that are adapted to be quickly charged with light energy from the sun or headlights of approaching vehicles and to emit a luminescent glowing light for an extended period of time.

[0016] In the embodiment shown in FIGS. 1 and 2, the main body **12** of the raised road marker **10** includes a first insert **30** fitted to a top portion of the main body to provide the top surface of the raised road marker **10**. The main body **12** is further fitted with inserts **32** on both the front face **16** and the rear face **18**. The inserts **30** and **32** are all formed of

a luminescent material which, in a preferred embodiment, comprises one or more rare earth materials.

**[0017]** The embodiment of the raised road marker shown in FIG. 3 includes a single insert that includes at least one insert **30** that is fitted within a dove tail shaped transverse slot formed in the top portion of the main body **12** of the raised road marker **10**. The insert **30** is congruently configured to fit within the dove tail shaped transverse slot so that the insert, formed of one or more rare earth materials, is held within the raised road marker and forms a rounded or dome shaped top surface of the raised road marker that is visible at night from all directions of approach.

**[0018]** While the present invention has been shown and described in accordance with several preferred and practical embodiments, it is recognized that departures from the instant disclosure are fully contemplated within the spirit and scope of the present invention which is not to be limited except as defined in the following claims, as interpreted under the Doctrine of Equivalence.

What is claimed is:

1. A raised road marker comprising:

a main body having a top surface, a front face, a rear face and a bottom side; and

at least a portion of the main body being formed of a luminescent material including at least one rare earth material.

2. A raised road marker comprising:

a main body having a top portion with a top surface, a front face, a rear face, and a bottom side; and

at least one insert fitted within said main body and at least partially exposed on an exterior of said main body, and said at least one insert being formed of a luminescent material including at least one rare earth material.

3. The raised road marker as recited in claim 2 wherein the at least one insert is fitted within the top portion of the main body to define the top surface.

4. The raised road marker as recited in claim 2 wherein the at least one insert is fitted within the front face of the main body.

5. The raised road marker as recited in claim 2 wherein the at least one insert is fitted within the rear face of the main body.

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