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Siu

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- (54) **INFILL FOR BOLLARD FOOTING HOLE**
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- (22) Filed: **Jun. 4, 2007**

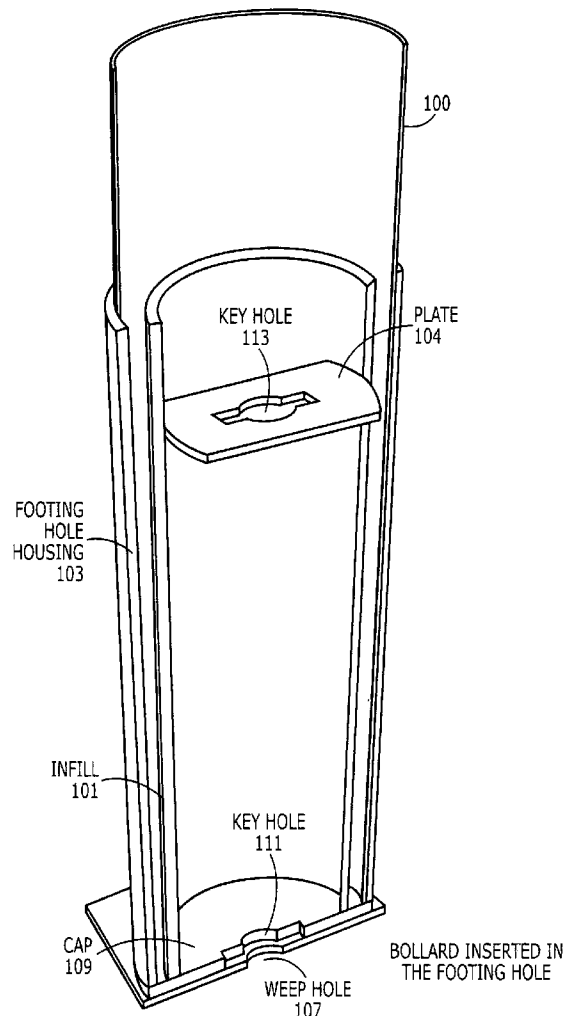
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- Primary Examiner*—Raymond W Addie
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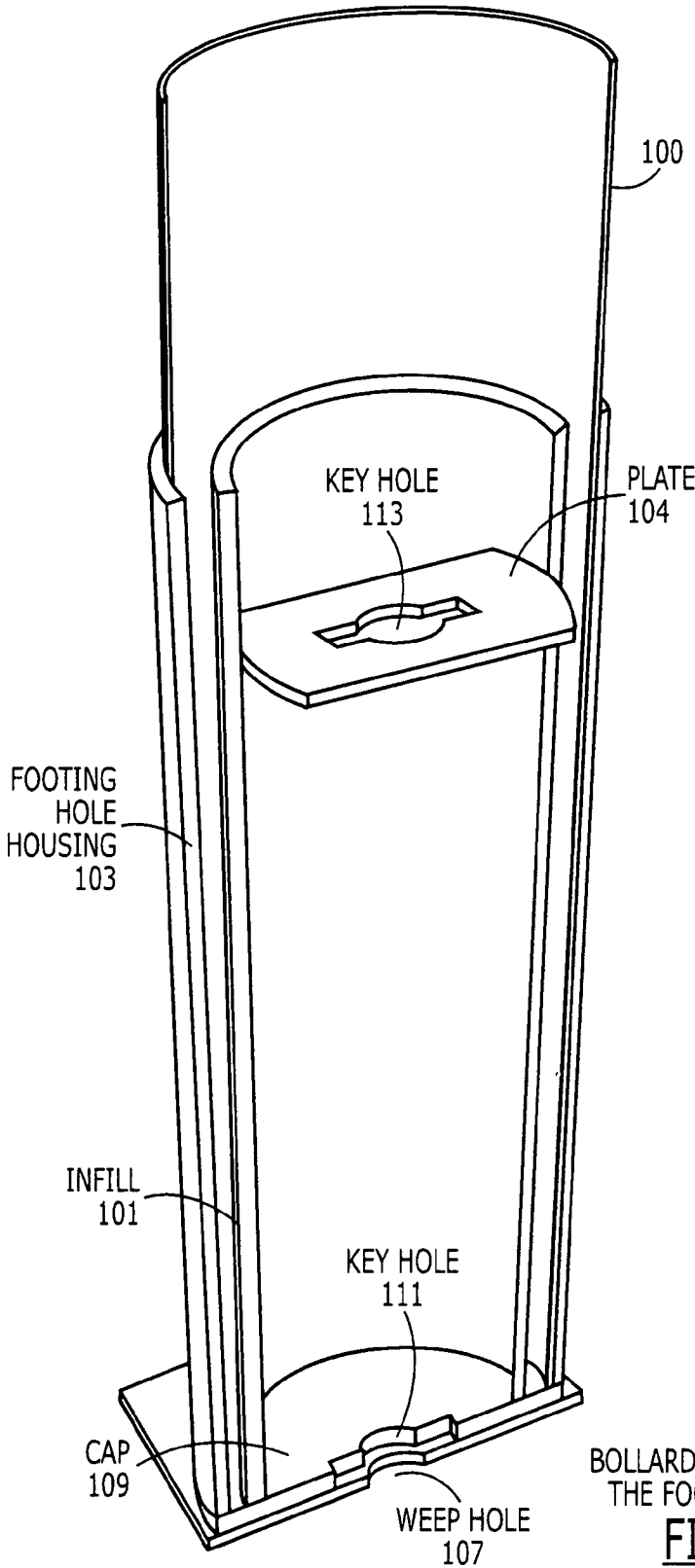
- (51) **Int. Cl.**
E01F 9/011 (2006.01)
E01F 9/013 (2006.01)
 - (52) **U.S. Cl.** **404/11; 404/10**
 - (58) **Field of Classification Search** 404/6,
404/9, 11, 10
- See application file for complete search history.

(57) **ABSTRACT**

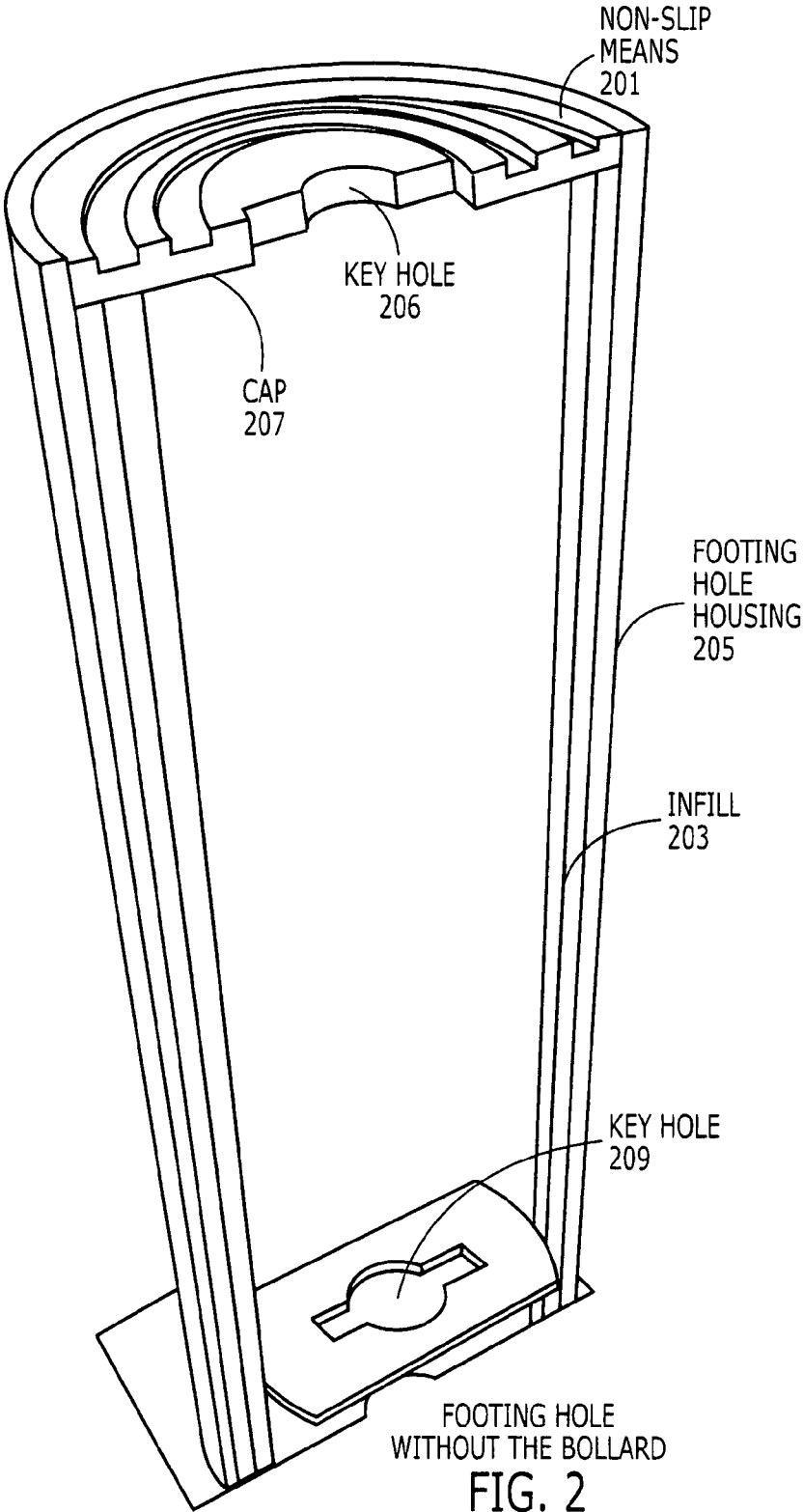
The invention relates to an infill which can be inserted into a bollard footing hole. The infill is designed such that it allows a bollard to be fit over it, and the infill fits within a footing hole. Methods of covering a footing hole are also bought.

10 Claims, 4 Drawing Sheets





BOLLARD INSERTED IN THE FOOTING HOLE
FIG. 1



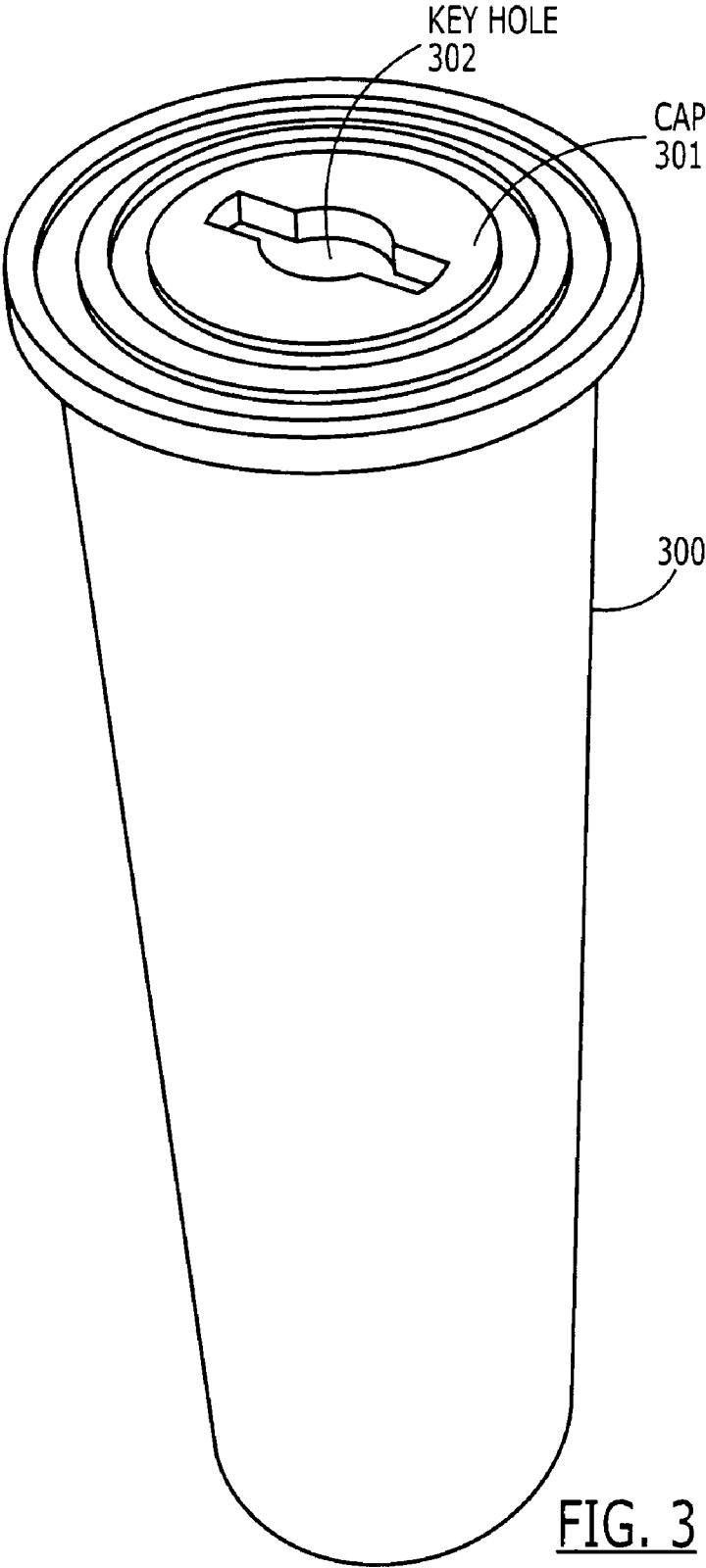


FIG. 3

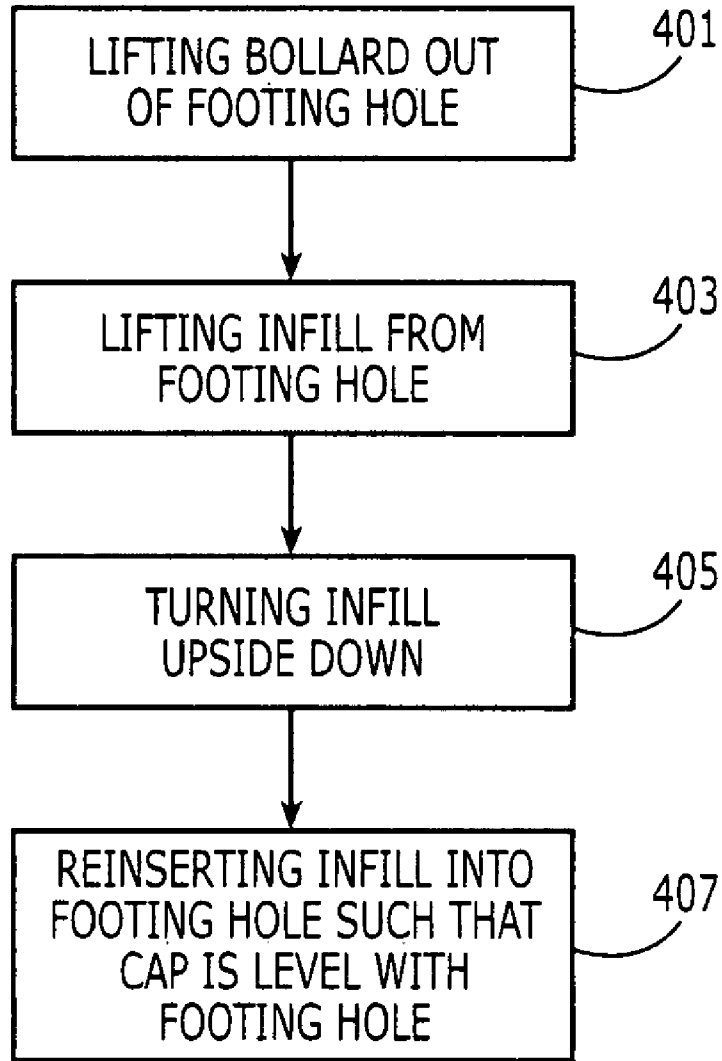


FIG. 4

INFIll FOR BOLLARD FOOTING HOLE

BACKGROUND

A bollard is a short vertical post. Bollards, such as posts, poles, columns and bars, are commonly used in urban areas as well as other public environments for more flexible applications. Bollards are often removable, allowing a bollard to be positioned or not when designing traffic control. However, when removable, a footing hole appears on the ground when a bollard is removed. The hole causes dangerous situations for people, and traps rubbish and creates inconvenience for inserting the bollard into the footing hole. To address this and cover the hole, a cap is attached to the ground or the footing hole housing. The cap covers the hole when a bollard is removed. However, the cap is flipped up when the bollard is inserted in the hole. The cap may then be inconvenient or even dangerous.

In other case, some people use additional devices or objects to cover the holes. However, such additional infills require additional space for storage and they are inconvenient for handling.

It is a goal of the present invention to cover a bollard footing hole with an infill and overcome the disadvantages and problems in the prior art.

DESCRIPTION

The present invention proposes an infill which can be inserted into a bollard footing hole no matter if a bollard is inserted in the hole or not, such infill being able to cover the hole while avoiding hazardous or dangerous situations.

The present invention also proposes covering a footing hole housing by using an infill that is capable of being over-turned and repositioned in the footing hole housing.

These and other features, aspects, and advantages of the apparatus and methods of the present invention will become better understood from the following description, appended claims, and accompanying drawings where:

FIG. 1 shows cross-sectional three dimensional view of the infill positioned in the footing hole housing with the bollard positioned thereon.

FIG. 2 shows the cross-sectional three dimensional view of the infill positioned in the footing hole housing such that it positions its cover over the footing hole housing.

FIG. 3 shows an embodiment of the infill in a three dimensional view.

FIG. 4 shows a method of covering a footing hole housing with an infill.

The following description of certain exemplary embodiment(s) is merely exemplary in nature and is in no way intended to limit the invention, its application, or uses. Throughout this description, the term "footing hole" refers to a footing hole with or without a footing hole housing.

Now, to FIGS. 1-4,

The present invention is related to an infill which can be inserted into a footing hole along with a hollow bollard. The present invention also focuses on a method for covering a footing hole utilizing an infill.

FIG. 1 shows an embodiment of the cross-sectional three dimensional view of infill **101** apparatus of the present invention. Included with the infill **101**, are the footing hole housing **103** and a removable bollard **100**.

The infill **101**, as inserted as show in FIG. 1, includes the cap **109**.

Inside the infill **101**, there is a plate **104** with a key hole **113** at the centre of the plate **104**. The key hole **113** is for a key (in

T shape) to be put in for pulling out the infill **101** from the footing hole housing **103** easily.

At another part of the infill **101**, a key hole **111** is centered. At the same end of the infill **101** as the key hole **111**, a cap **109** is positioned. The cap **109** has a diameter that is larger than the diameter of the infill **101**.

Internally, the infill **101** can be hollow or solid. Preferably, the infill **101** is hollow, allowing the infill **101** to be light weight and easily movable. The cross section of the infill **101** can be a form such as a circle, square, rectangle, hexagon, or octagon.

The diameter of the infill **101** excluding the cap **109** is smaller than the diameter of the bollard **100**. This is to allow the bollard **100** to be placed over the infill **100**. The height or length of the infill **101** (including the cap **109**) is preferably the same as the internal length or depth of the footing hole housing **103**.

As will be discussed later, the cap **109** of the infill **101** includes non-slip means such as troughs, slots, grooves, trenches, patterns, non-slippery texture, and the like.

Below the infill **101**, is a weep hole **107** in the footing hole housing **103**. The weep hole **107** is provided to extract water, and foreign substances such as dirt.

FIG. 2 is an embodiment of the cross-sectional three dimensional view of the infill **203** positioned as a hole covering for a footing hole housing **205**.

As shown in the embodiment, the cap **207** of infill **203** is positioned topside. In this position, the non-slip means **201** assist pedestrians in not being injured if they step on the cap **207**. When the cap **207** is topside, the open end of the infill **203** is facing downward.

A key hole **206** is at the center of the cap **207**. The key hole **206** is for a key (in T shape) to be put in for pulling out the infill **203** from the footing hole housing **205** easily. The diameter of the cap **207** is same as or slightly smaller than the internal diameter of the footing hole housing **205**.

FIG. 3 shows the three dimensional view of the infill **300**, wherein the cap **301** of the infill is topside. As shown, the key hole **302** is at the center of the cap **301**.

FIG. 4 shows an embodiment of the method of covering a footing hole utilizing the infill apparatus of the present invention. The steps include lifting the bollard out of the footing hole **401**. The bollard should be hollow in order to incorporate the infill within the bollard. As shown previously (FIG. 1), the diameter of the bollard should be less than diameter of footing hole, allowing the bollard's sides to fit with the footing hole. Following, the infill was lifted from footing hole **403**. The infill can be lifted via a hole, key hole, or handle. Preferably, a key hole is positioned at the center of the infill. After being lifted from the footing hole, the infill is turned upside down **405** or turned such that the cap of the infill is topside. In another embodiment, if the footing hole is at any angle from a horizontal ground to a vertical wall, the infill will be removal and rotated such that the cap of the infill is outside the footing hole.

After rotating the infill, the infill is reinserted into the footing hole **407**. The infill will be reinserted such that the cap is outside the footing hole. When fully inserted, the top of the cap is at the same horizontal level of the ground level.

Having described embodiments of the present system with reference to the accompanying drawings, it is to be understood that the present system is not limited to the precise embodiments, and that various changes and modifications may be effected therein by one having ordinary skill in the art without departing from the scope or spirit as defined in the appended claims.

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In interpreting the appended claims, it should be understood that:

- a) the word “comprising” does not exclude the presence of other elements or acts than those listed in the given claim;
- b) the word “a” or “an” preceding an element does not exclude the presence of a plurality of such elements;
- c) any reference signs in the claims do not limit their scope;
- d) any of the disclosed devices or portions thereof may be combined together or separated into further portions unless specifically stated otherwise; and
- e) no specific sequence of acts or steps is intended to be required unless specifically indicated.

The invention claimed is:

1. A footing hole infill comprising a plate inside said infill having a key hole on said plate; and a cap having a key hole positioned thereon and having a non-slip means; wherein the diameter of the infill is smaller than a corresponding bollard.
2. The footing hole infill in claim 1, wherein said infill has a cross section in the form of a circle, square, rectangle, hexagon, or octagon.
3. The footing hole infill in claim 2, wherein said cap of said infill has a diameter that is larger than the infill body external diameter.
4. A bollard system, comprising a removable infill having an external diameter smaller than the internal diameter of the bollard;

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a removable bollard having an external diameter smaller than a footing hole, but the removable bollard has an internal diameter larger than the external diameter of said removable infill; and a footing hole.

5. The bollard system in claim 4, wherein said removable infill is comprised of a body, and a cap, wherein a keyhole is positioned at either ends of a plate inside infill body and cap.

6. The bollard system in claim 4, further comprising a weep hole on the bottom of said footing hole.

7. The bollard system in claim 5, wherein said cap further comprises a non-slip means.

8. The bollard system in claim 5, wherein said cap has a diameter equal to or slightly smaller than the bollard's external diameter.

9. A method of covering a footing hole comprising the steps of

lifting a bollard out of a footing hole;

lifting an infill from said footing hole;

rotating said infill such that the infill's cap is on the opposite side from when it was inside said footing hole; and reinserting said infill,

wherein reinstating said infill into said footing hole proceeds until the cap of said infill is equal level with the footing hole.

10. The method of covering said footing hole in claim 9, wherein lifting said infill occurs via a hole, keyhole, or handle.

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