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(54) **Method of using recycled materials to make safety cones**

Verfahren zur Verwendung von recyceltem Material zur Herstellung von Sicherheitskegeln

Procédé d'utilisation de matériaux recyclés pour fabriquer des cônes de sécurité

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WO-A-2006/126787 **US-A- 2 942 571**

- **BK MIKOFALVY ET AL: "Traffic Cones from Recycled Vinyl" JOURNAL OF VINYL TECHNOLOGY, MANCHESTER, NH, US, vol. 15, no. 3, 1 September 1993 (1993-09-01), pages 159-163, XP007907669 ISSN: 0193-7197**

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Description

BACKGROUND OF THE INVENTION

Field of Invention

[0001] The invention relates to a method of making safety cones and, in particular, to a method of using recycled materials to make safety cone prototypes and then coating them with a specific color.

Related Art

[0002] The usual safety cones for road marks or alerting signs are made of PVC, PE, or rubber. However, the oil price has been soaring in recent years. The related plastic chemical materials also become more expensive. Therefore, how to reduce the production cost of safety cones has become an important issue for manufacturers.

[0003] The safety cone 5 used for road guidance and indication, as shown in FIG. 8, is usually made by attaching a reflective sticker 6 on the outer surface thereof. It then reflects the beam of light to notify an incoming car. Since the safety cone 5 has to have a bright color, its plastic material is mixed with some dye during the manufacturing process. In this case, one cannot use recycled material in order to prevent a dirty surface color. Moreover, the conventional method of making safety cones 5 is complicated and time-consuming. Besides, the required color has to be prepared in advance. Therefore, it is not suitable for making a small quantity of safety cones or safety cones with some special color.

[0004] A method of using recycled materials to make safety cones in accordance with the first part of claim 1 is known from B. K. Mikofalvy, et al., "Traffic Cones From Recycled Vinyl", Journal of Vinyl Technology, Manchester, NH, US, 1 September 1993, pages 159-163.

[0005] U.S. Patent 2,942,571 discloses a method of making safety cones using recycled materials in accordance with the first part of claim 8.

SUMMARY OF THE INVENTION

[0006] An objective of the invention is to provide a method that makes safety cones using recycled materials and applying a desired, firmly adhering color thereon. By adding appropriate fluorescent agents or reflective materials into the paint, the safety cones can have very good reflective effect.

[0007] The above-mentioned objects are achieved by the methods of the invention as defined in claims 1 and 8.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The invention will become more fully understood from the detailed description given herein below illustration only, and thus is not limitative of the present invention, and wherein:

FIG. 1 is a cross-sectional view showing the structure of the disclosed safety cone according to the first embodiment of the invention;

FIG. 2 is a schematic view showing how a color is painted on the safety cone prototype;

FIG. 3 is a three-dimensional schematic view of the second embodiment of the invention;

FIG. 4 is a schematic view showing how the second embodiment is implemented;

FIG. 5 is a three-dimensional view of the third embodiment of the invention;

FIG. 6 is a three-dimensional view of the fourth embodiment of the invention;

FIG. 7 is a three-dimensional view of the fifth embodiment of the invention; and

FIG. 8 is a three-dimensional view of a conventional safety cone.

DETAILED DESCRIPTION OF THE INVENTION

[0009] The present invention will be apparent from the following detailed description, which proceeds with reference to the accompanying drawings, wherein the same references relate to the same elements.

[0010] According to a first embodiment of the disclosed method of making safety cones using recycled materials, it includes the following steps.

[0011] First, recycled materials are put in a molding machine (not shown). The molding machine can be an injection molding machine or stamp molding machine. The molding machine uses the recycled materials to integrally form safety cone prototypes **1,** whose structure is illustrated in FIG. 1.

[0012] A paint **2** containing plastic powders, resin, and dye is coated on the surface of the safety cone prototype **1,** rendering a colored safety cone **1** as shown in FIG. **2.** The paint **2** can be coated and adhered onto the surface of the safety cone prototype 1 by spraying, painting, showering, and soaking. The safety cone prototype **1** thus becomes a colored safety cone.

[0013] The paint **2** contains dye, resin, and plastic powders mixed in an appropriate proportion. The dye has mainly a bright color. The resin provides an adhesive force. The plastic powders of the paint **2** have the same ingredients as the recycled materials for making the safety cone prototype **1.** Therefore, the paint **2** thus prepared can firmly adhere onto the surface of the safety cone prototype **1.** Besides, the paint **2** can be added with some reflective material or fluorescent agent. In that case, there is no need to use additional reflective stickers for an alerting effect once the paint is coated on the surface of the safety cone prototype **1**.

[0014] In summary, the invention uses cheap recycled materials to mass-produce safety cone prototypes **1**. They are then coated with colors requested by clients. It can effectively reduce the production cost. Besides, it is more suitable for making a small quantity of safety cones or cones with a special color.

[0015] The invention has many other embodiments with minor variations from the first embodiment. Please refer to FIG. 3 for the second embodiment of the invention. In this case, the recycled materials are integrally formed into a safety cone with several holes **12.** In this embodiment, the safety cone prototype 1 has a hollow cone-shaped alerting body **13** and a base **14** connected to the bottom of the alerting body **13.** Each of the holes **12** on the alerting body **13** is circular.

[0016] Since the holes **12** are integrally formed in the molding machine, the safety cone prototype **1** does not need an additional punching process. By having many holes **12** on the alerting body **13,** the required materials and thus the cost for making a safety cone are further reduced.

[0017] Moreover, the above-mentioned design of having holes **12** on the alerting body **13** can reduce its wind cross section. As shown in FIG. 4, when a vehicle passes by and generates turbulence, most of the air flows directly through the holes 12 of the alerting body **13.** The safety cone is less likely to be blown away. As the alerting body 13 of the disclosed safety cone has holes **12,** its weight is greatly reduced so that its center of gravity is closer to the ground. This increases the stability thereof. As a result, the thickness of the base **14** can be appropriately decreased. It achieves the goal of maintaining good stability without increasing additional costs (e.g., placing a heavy weight). The safety cone therefore does not easily topple or shift under a strong wind.

[0018] Please refer to FIG. 5 for the third embodiment of the invention. It is different from the second embodiment in that the holes **12** on the alerting body **13** are square.

[0019] Please refer to FIG. 6 for the fourth embodiment of the invention. It is different from the second embodiment in that the alerting body is a hollow pyramid cone with several circular holes **12** on its surface as well.

[0020] Please refer to FIG. 7 for the fifth embodiment of the invention. It is different from the second embodiment in that the alerting body **13** has a cylindrical shape and several square holes **12** on its surface.

[0021] There are some other embodiments differing from the previous ones in certain parts. The sixth embodiment of the invention is different from the first embodiment in the following.

[0022] The recycled materials in the first embodiment are used to make new safety cone prototypes for color painting. In this embodiment, discolored or dirty safety cones are recycled and directly coated with the paint **2** mentioned before to render a new colored safety cone.

[0023] The paint **2** also has dye, resin and plastic powders with the same ingredients as the recycled safety cone, mixed in an appropriate proportion. The paint **2** thus prepared can be firmly adhered onto the surface of the recycled safety cone. Besides, the paint **2** can be added with some reflective material or fluorescent agent. In that case, there is no need to use additional reflective stickers for an alerting effect once the paint is coated on the surface of the safety cone prototype **1.** The paint **2** can be applied and adhered onto the surface of the recycled safety cone by spraying, painting, showering, and soaking.

[0024] The safety cone produced using this embodiment method can achieve all effects of that in the first embodiment. It further avoids the injection molding process of making safety cone prototypes.

[0025] Although the invention has been described with reference to specific embodiments, this description is not meant to be construed in a limiting sense. Various modifications of the disclosed embodiments, as well as alternative embodiments, will be apparent to persons skilled in the art. It is, therefore, contemplated that the appended claims will cover all modifications that fall within the true scope of the invention.

Claims

1. A method of using recycled materials to make safety cones, wherein
   the recycled materials are disposed in a molding machine to form safety cone prototypes (1); and
   a paint (2)is coated onto the surface of the safety cone prototypes (1) to render colored safety cones, **characterised in that** the paint contains plastic powder resin and dye, wherein the plastic powder has the same ingredients as the recycled materials.

2. The method of claim 1 wherein the paint (2) further includes a reflective material.

3. The method of claim 1 or 2 wherein the paint (2) further includes a fluorescent agent.

4. The method of any preceding claim wherein the paint is adhered onto the surface of the safety cone prototype (**1**) by spraying, painting, showering, or soaking.

5. The method of any preceding claim wherein the safety cone prototype (**1**) formed by the molding machine has an alerting body (**13**) and a base (**14**) connected to the bottom of the alerting body (**13**), the alerting body (**13**) having a plurality of holes (**12**).

6. The method of claim 5 wherein the holes (**12**) are circular or square.

7. The method of claim 5 or 6 wherein the alerting body (**13**) has the shape of a circular cone, a pyramid or a cylinder.

8. A method of making safety cones using recycled materials by:

   recycling used and discolored or dirty safety

cones; and
coating a paint (**2**) onto the surface of the recycled safety cone to render a colored safety cone, **characterised in that** the paint contains plastic powder resin and dye, wherein the plastic powder has the same ingredients as the recycled materials.

9. The method of claim 8 wherein the paint (**2**) further includes a reflective material.

10. The method of claim 8 or 9 wherein the paint (**2**) further includes a fluorescent agent.

11. The method of any one of claims 8 to 10 wherein the paint is adhered onto the surface of the safety cone prototype (**1**) by spraying, painting, showering, or soaking.

Patentansprüche

1. Verfahren zur Verwendung von Recyclingmaterialien zur Herstellung von Sicherheitskegeln, wobei
die Recyclingmaterialien zur Erzeugung von Sicherheitskegel-Prototypen (1) in eine Formmaschine gegeben werden und
auf die Oberfläche der Sicherheitskegel-Prototypen (1) Farbe (2) aufgetragen wird, um farbige Sicherheitskegel zu erzeugen,
dadurch gekennzeichnet, dass die Farbe ein plastisches Kunstharzpulver und einen Farbstoff enthält, wobei das plastisches Pulver die gleichen Inhaltsstoffe aufweist wie die Recyclingmaterialien.

2. Verfahren nach Anspruch 1, wobei die Farbe (2) außerdem ein reflektierendes Material enthält.

3. Verfahren nach Anspruch 1 oder 2, wobei die Farbe (2) außerdem einen Fluoreszenzstoff enthält.

4. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Farbe durch Sprühen, Färben, Spritzen oder Tauchen auf die Oberfläche des Sicherheitskegel-Prototypen (1) aufgebracht wird.

5. Verfahren nach einem der vorhergehenden Ansprüche, wobei der mit der Formmaschine erzeugte Sicherheitskegel-Prototyp (1) einen Warnkörper (13) und einen mit dessen Unterseite verbundenen Sokkel (14) aufweist und der Warnkörper (13) mehrere Löcher(12) hat.

6. Verfahren nach Anspruch 5, wobei die Löcher (12) rund oder viereckig sind.

7. Verfahren nach Anspruch 5 oder 6, wobei der Warnkörper (13) die Form eines Kreiskegels, einer Pyramide oder eines Zylinders hat.

8. Verfahren zur Herstellung von Sicherheitskegeln unter Verwendung von Recyclingmaterialien, wobei
gebrauchte und verfärbte oder verschmutzte Sicherheitskegel recycelt werden und
auf die Oberfläche des recycelten Sicherheitskegels Farbe (2) aufgetragen wird, um einen farbigen Sicherheitskegel zu erzeugen,
dadurch gekennzeichnet, dass die Farbe ein plastisches Kunstharzpulver und einen Farbstoff enthält, wobei das plastisches Pulver die gleichen Inhaltsstoffe aufweist wie die Recyclingmaterialien.

9. Verfahren nach Anspruch 8, wobei die Farbe (2) außerdem ein reflektierendes Material enthält.

10. Verfahren nach Anspruch 8 oder 9, wobei die Farbe (2) außerdem einen Fluoreszenzstoff enthält.

11. Verfahren nach einem der Ansprüche 8 bis 10, wobei die Farbe durch Sprühen, Färben, Spritzen oder Tauchen auf die Oberfläche des Sicherheitskegel-Prototypen (1) aufgebracht wird.

Revendications

1. Procédé d'utilisation de matériaux recyclés pour fabriquer des cônes de sécurité, dans lequel :

les matériaux recyclés sont disposés dans une machine de moulage pour former des prototypes de cône de sécurité (1), et
une peinture (2) est appliquée sur la surface des prototypes de cône de sécurité (1) pour colorer les cônes de sécurité,
caractérisé en ce que la peinture contient de la poudre de matière plastique, de la résine et du colorant, la poudre de matière plastique ayant les mêmes ingrédients que les matériaux recyclés.

2. Procédé selon la revendication 1, dans lequel la peinture (2) comprend en outre un matériau réfléchissant.

3. Procédé selon la revendication 1 ou 2, dans lequel la peinture (2) comprend en outre un agent fluorescent.

4. Procédé selon l'une quelconque des revendications précédentes, dans lequel la peinture est appliquée sur la surface du prototype du cône de sécurité (1) par pulvérisation, peinture, douche ou trempage.

5. Procédé selon l'une quelconque des revendications précédentes, dans lequel le prototype de cône de

sécurité (1) formé par la machine de moulage comporte un organe d'alerte (13) et une base (14) reliée à la partie inférieure de l'organe d'alerte (13), l'organe d'alerte (13) ayant une pluralité de trous (12).

6. Procédé selon la revendication 5, dans lequel les trous (12) sont de forme circulaire ou carrée.

7. Procédé selon la revendication 5 ou 6, dans lequel le corps d'alerte (13) a la forme d'un cône circulaire, d'une pyramide ou d'un cylindre.

8. Procédé de fabrication de cônes de sécurité utilisant des matériaux recyclés en :

recyclant des cônes de sécurité usagés et décolorés ou sales, et
en appliquant une peinture (2) sur la surface du cône de sécurité recyclé pour colorer un cône de sécurité,
caractérisé en ce que la peinture contient de la poudre de matière plastique, de la résine et du colorant, la poudre de matière plastique ayant les mêmes ingrédients que les matériaux recyclés.

9. Procédé selon la revendication 8, dans lequel la peinture (2) comprend en outre un matériau réfléchissant.

10. Procédé selon la revendication 8 ou 9, dans lequel la peinture (2) comprend en outre un agent fluorescent.

11. Procédé selon l'une quelconque des revendications 8 à 10, dans lequel la peinture est appliquée sur la surface du prototype du cône de sécurité (1) par pulvérisation, peinture, douche ou trempage.

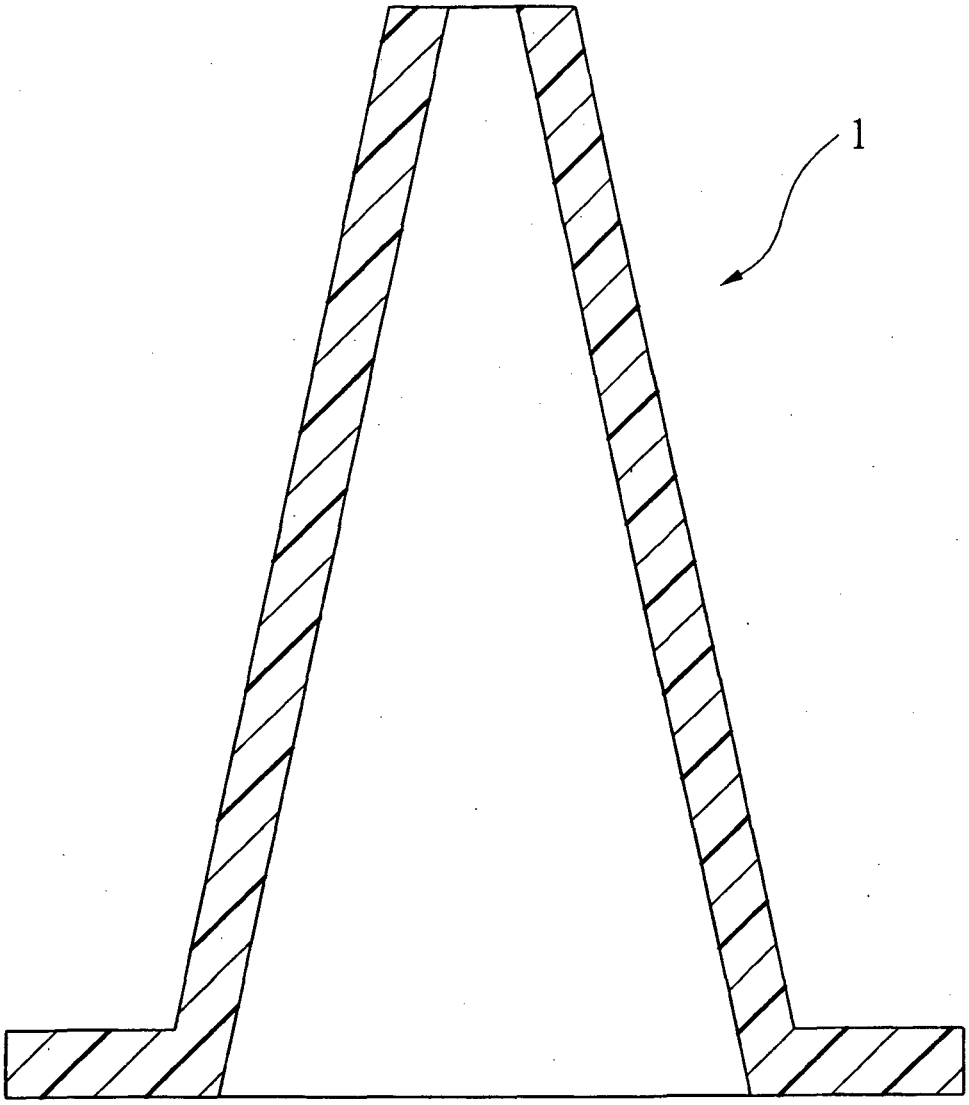


FIG. 1

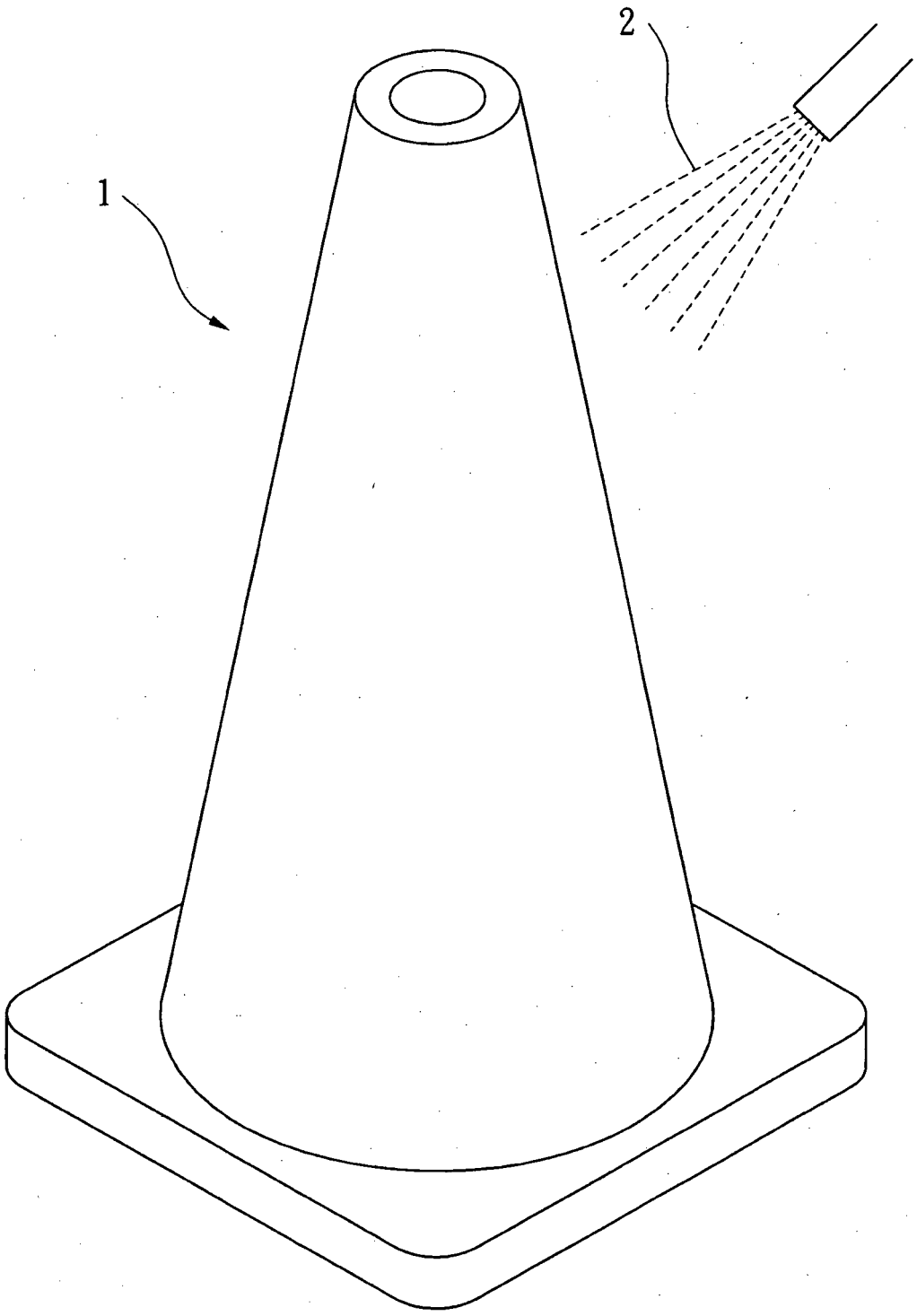


FIG. 2

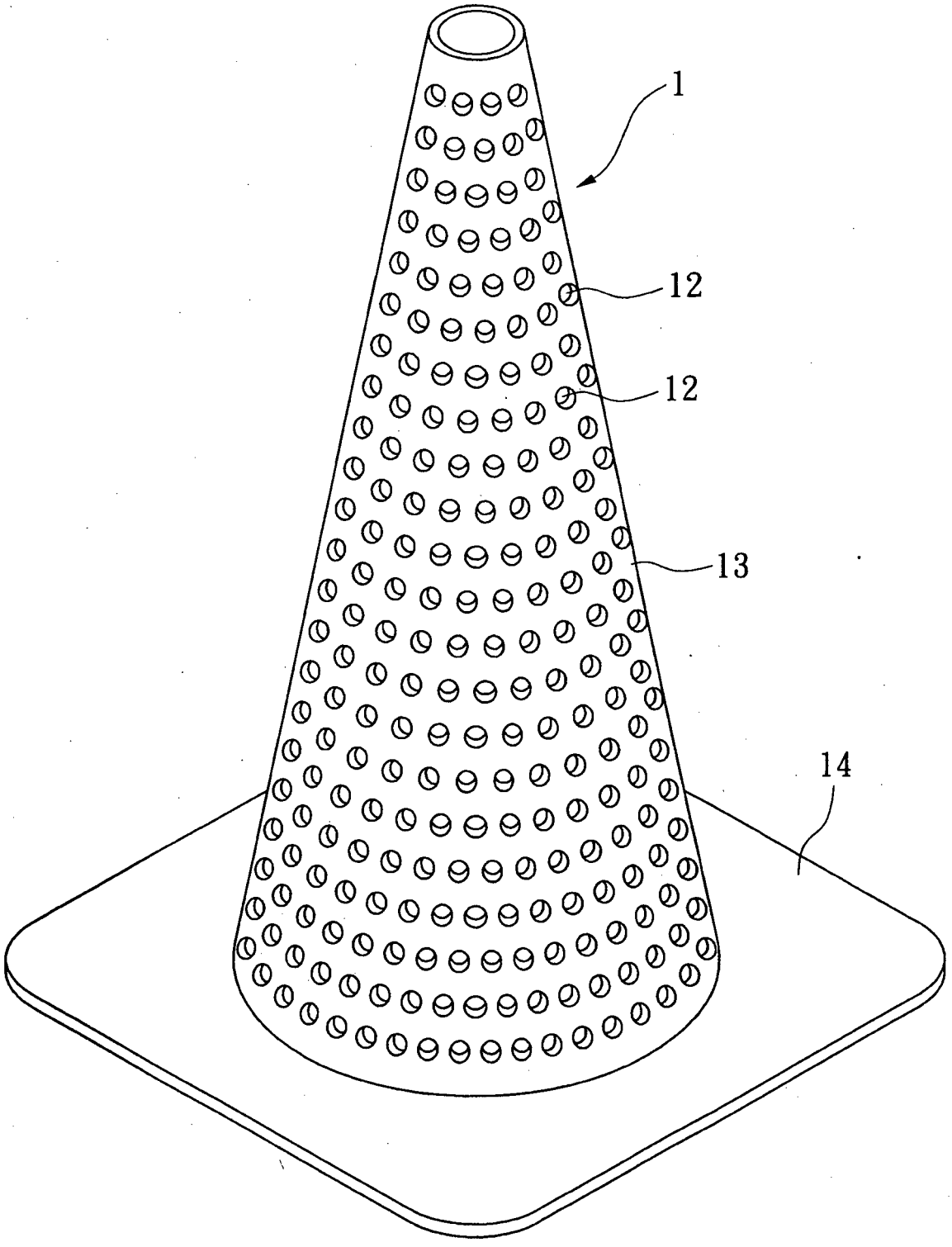


FIG. 3

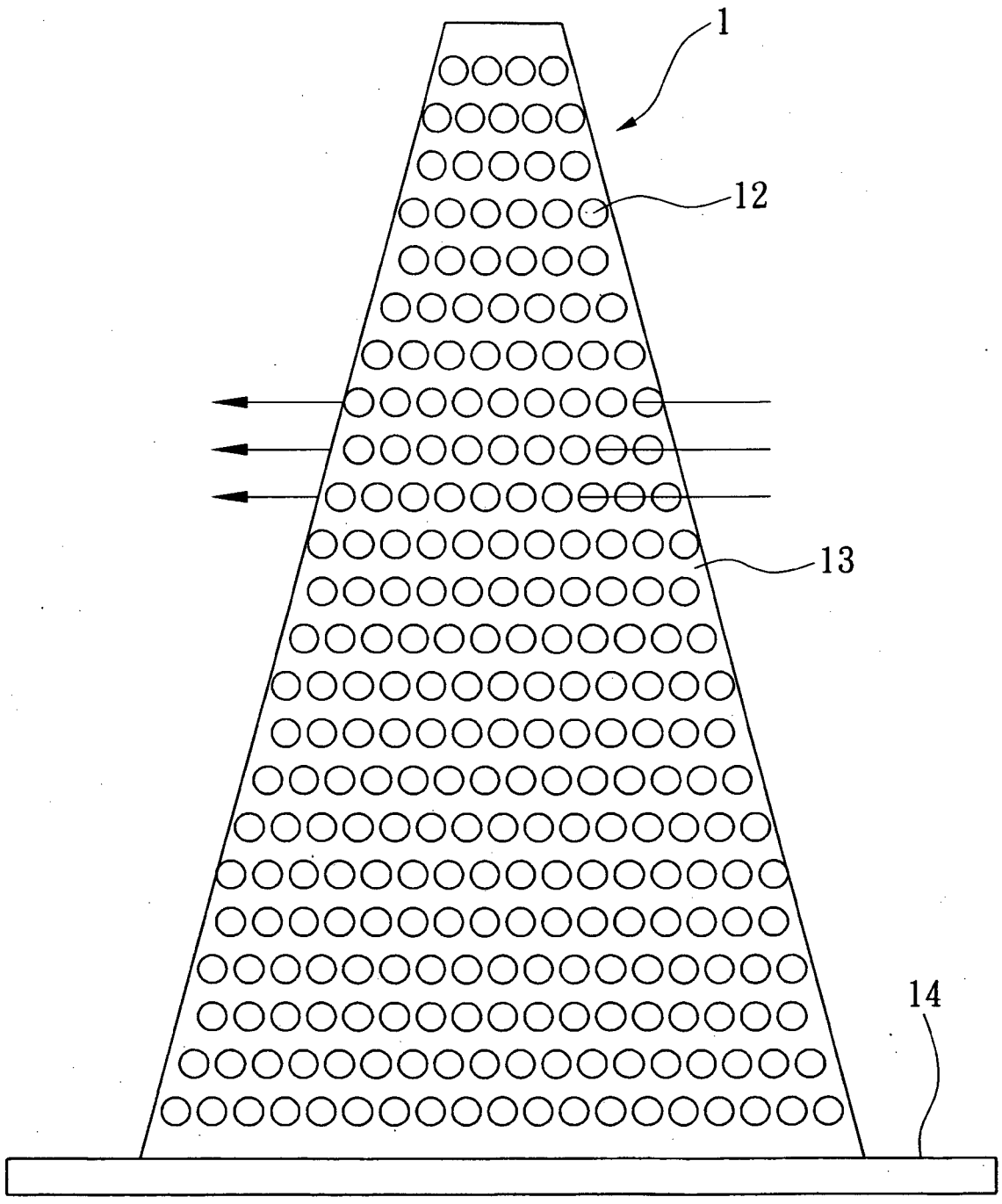


FIG. 4

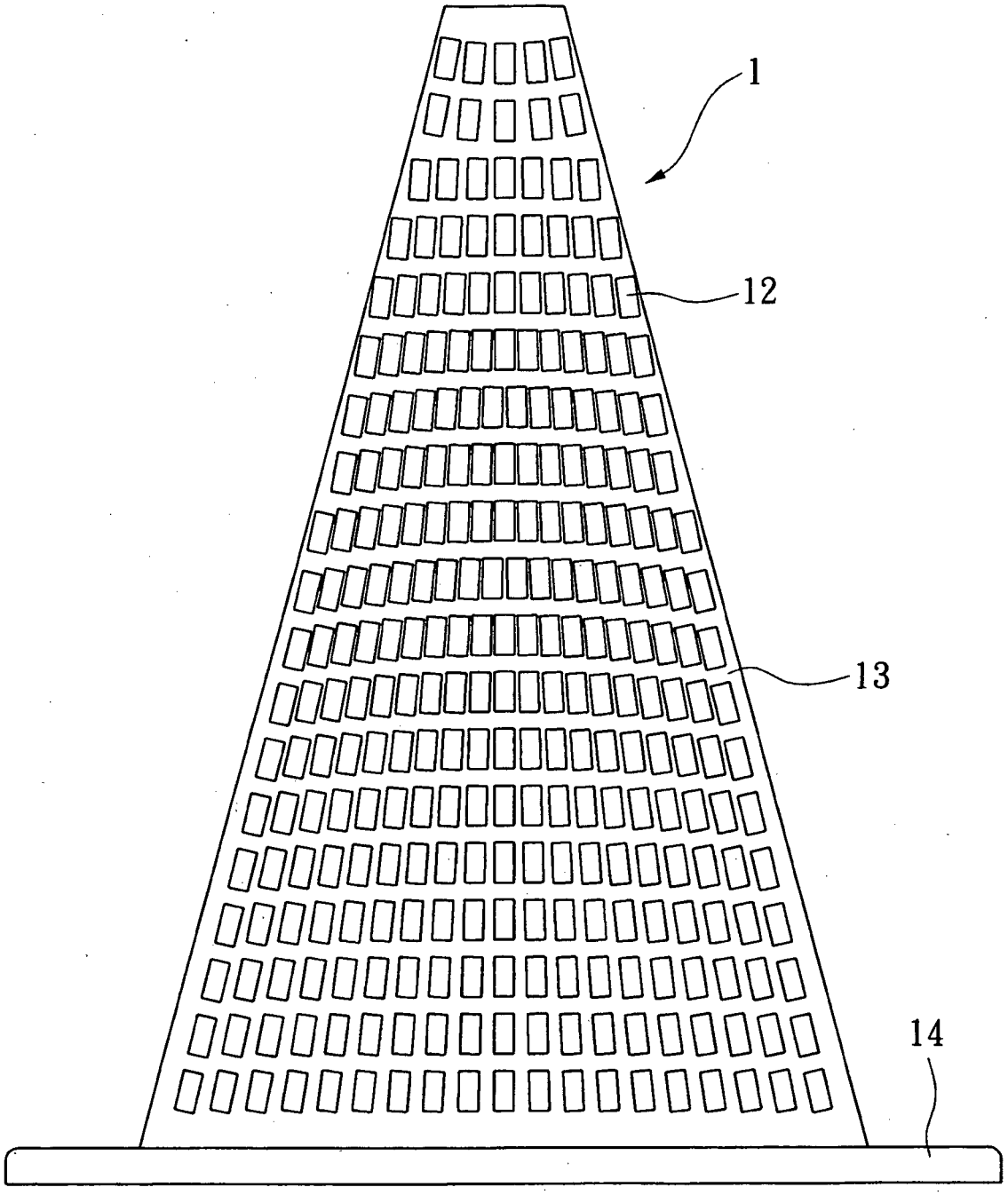


FIG. 5

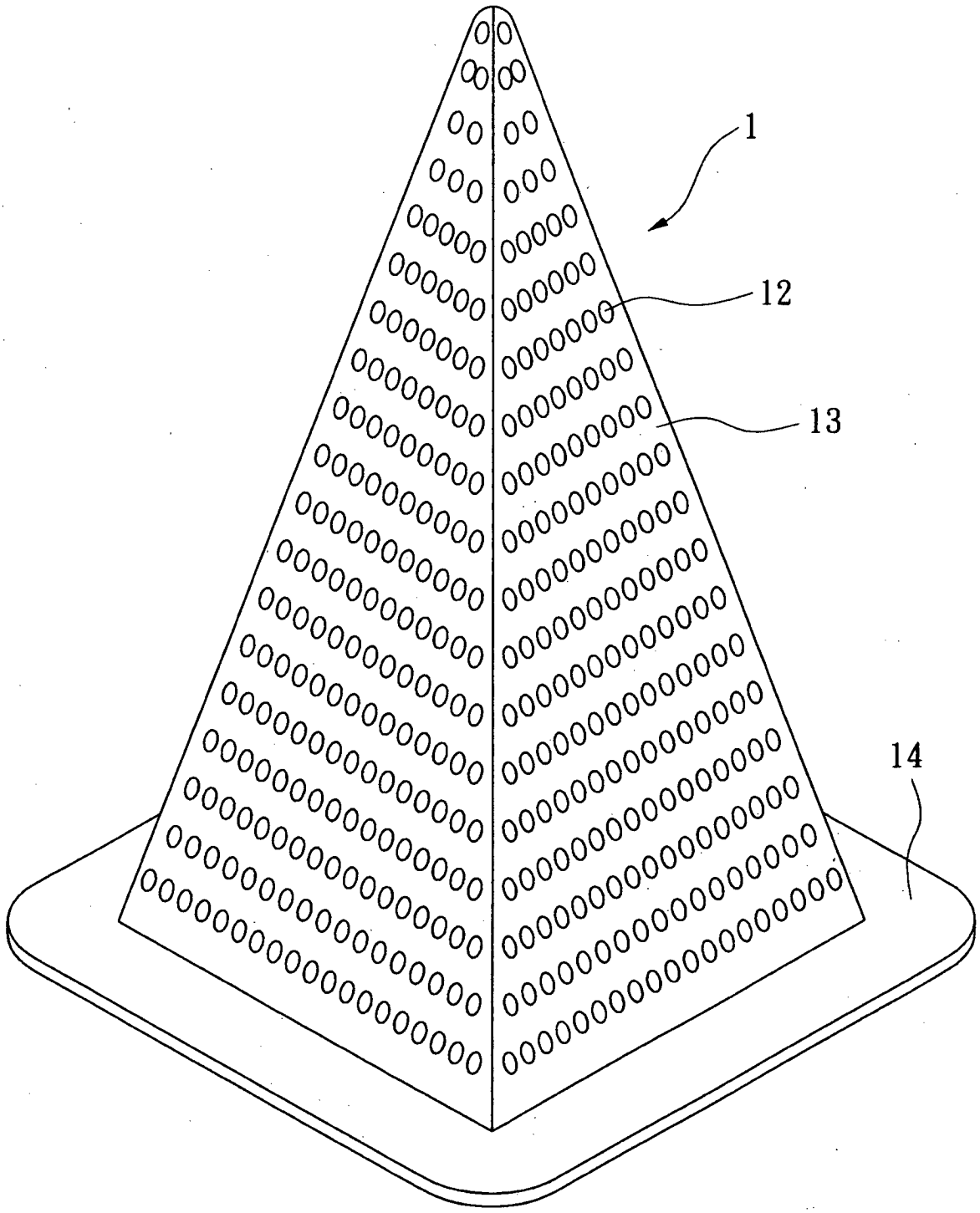


FIG. 6

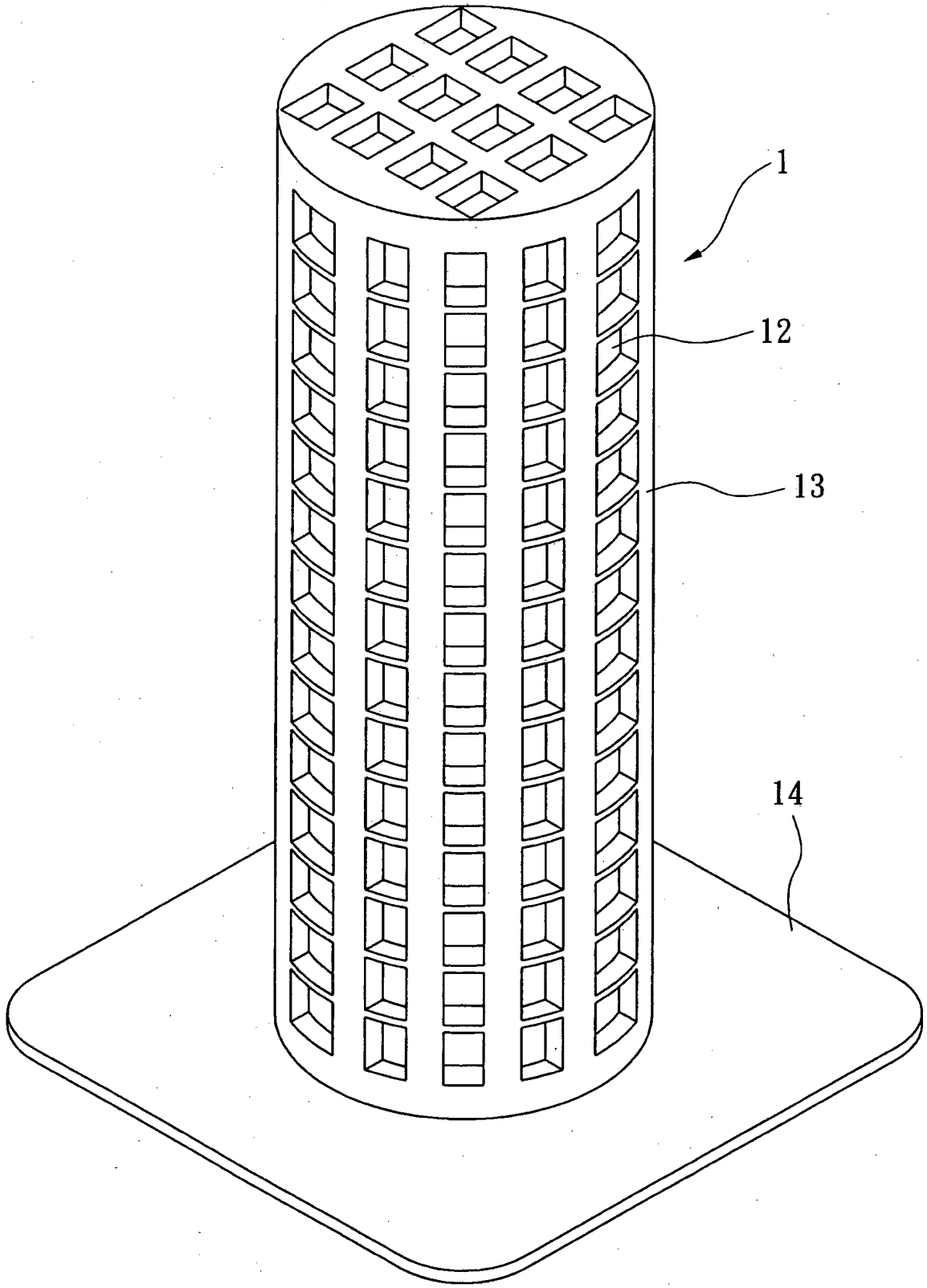


FIG. 7

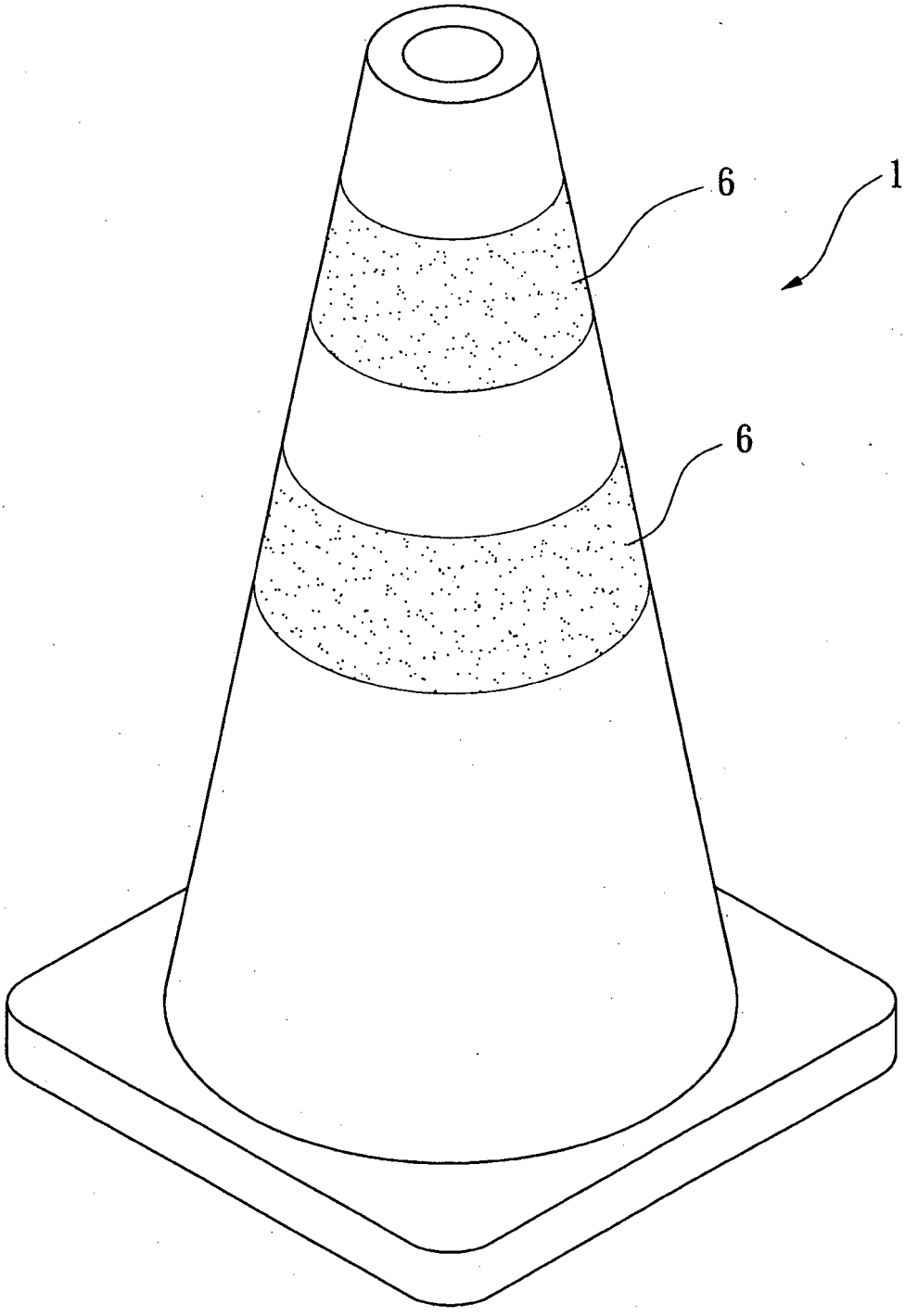


FIG. 8
PRIOR ART

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2942571 A **[0005]**

Non-patent literature cited in the description

- **B. K. MIKOFALVY et al.** Traffic Cones From Recycled Vinyl. *Journal of Vinyl Technology, Manchester, NH, US,* 01 September 1993, 159-163 **[0004]**