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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

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

(57) For making safety cones, recycled materials are disposed in a molding machine to form safety cone prototypes **1**. Then, a paint **2** containing plastic powders, resin and dye is coated onto the surface of the safety cone prototypes **1** to create colored safety cones. Using recycled materials to make safety cones can effectively reduce cost. At the same time, the safety cones are colored to provide specific functions.

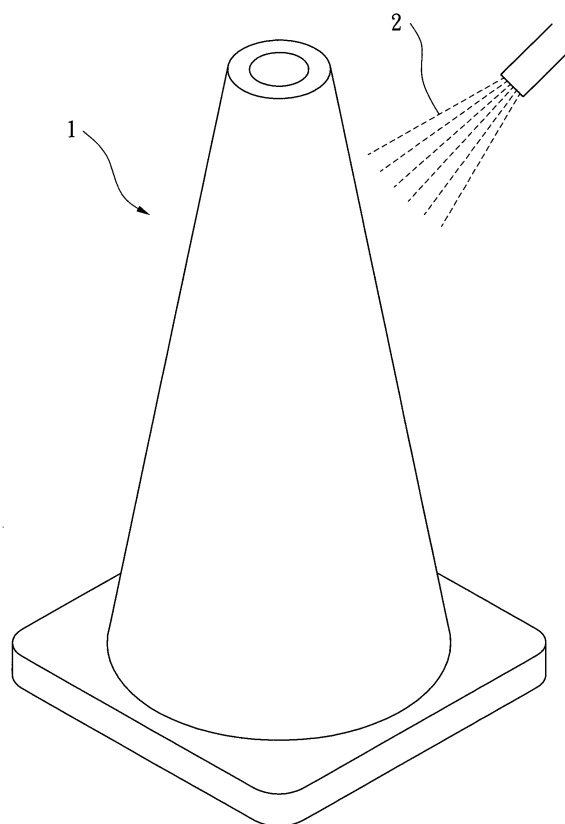


FIG. 2

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.

SUMMARY OF THE INVENTION

[0004] An objective of the invention is to provide a method that makes safety cones using recycled materials. Cheap recycled materials are used to mass-produce safety cone prototypes, which are then coated with desired colors. This can effectively reduce the production cost.

[0005] Another objective of the invention is to provide a method that makes safety cones using recycled materials. After a safety cone prototype is made, a desired color is applied thereon so that the color can be easily changed. By adding appropriate fluorescent agents or reflective materials into the paint, the safety cones can have very good reflective effect.

[0006] To achieve the above-mentioned objects, the disclosed method of making safety cones using recycled materials has the following features.

[0007] First, the recycled materials are collected in a molding machine. The molding machine uses the recycled materials to form safety cone prototypes.

[0008] Afterwards, a paint containing plastic powder, resin, and dye is coated on the surface of the safety cone prototype, rendering a colored safety cone.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] 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

[0010] 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.

[0011] According to a first embodiment of the disclosed method of making safety cones using recycled materials, it includes the following steps.

[0012] 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.

[0013] 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.

[0014] 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**.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] The paint **2** also has dye, resin and plastic pow-

ders 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.

[0025] 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.

[0026] 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, **characterized in that:**

the recycled materials are disposed in a molding machine to form safety cone prototypes **(1)**; and a paint **(2)** containing plastic powder, resin and dye is coated onto the surface of the safety cone prototypes **(1)** to render colored safety cones.

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 plastic powder has the same ingredients as the recycled materials.
5. 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.
6. 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)**.
7. The method of claim 6 wherein the holes **(12)** are

circular or square.

8. The method of claim 6 or 7 wherein the alerting body (13) has the shape of a circular cone, a pyramid or a cylinder. 5
9. A method of making safety cones using recycled materials, **characterized by:**
recycling used and discolored or dirty safety cones; and
coating a paint (2) containing plastic powder, resin and dye onto the surface of the recycled safety cone to render a colored safety cone. 10
15
10. The method of claim 9 wherein the paint (2) further includes a reflective material.
11. The method of claim 9 or 10 wherein the paint (2) further includes a fluorescent agent. 20
12. The method of any one of claims 9 to 11 wherein the plastic powder has the same ingredients as the recycled materials. 25
13. The method of any one of claims 9 to 12 wherein the paint is adhered onto the surface of the safety cone prototype (1) by spraying, painting, showering, or soaking. 30

Amended claims in accordance with Rule 137(2) EPC.

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. 35
40
2. The method of claim 1 wherein the paint (2) further includes a reflective material. 45
3. The method of claim 1 or 2 wherein the paint (2) further includes a fluorescent agent. 50
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. 55
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) con-

nected to the bottom of the alerting body (13), the alerting body (13) having a plurality of holes (12).

6. The method of claim 6 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.

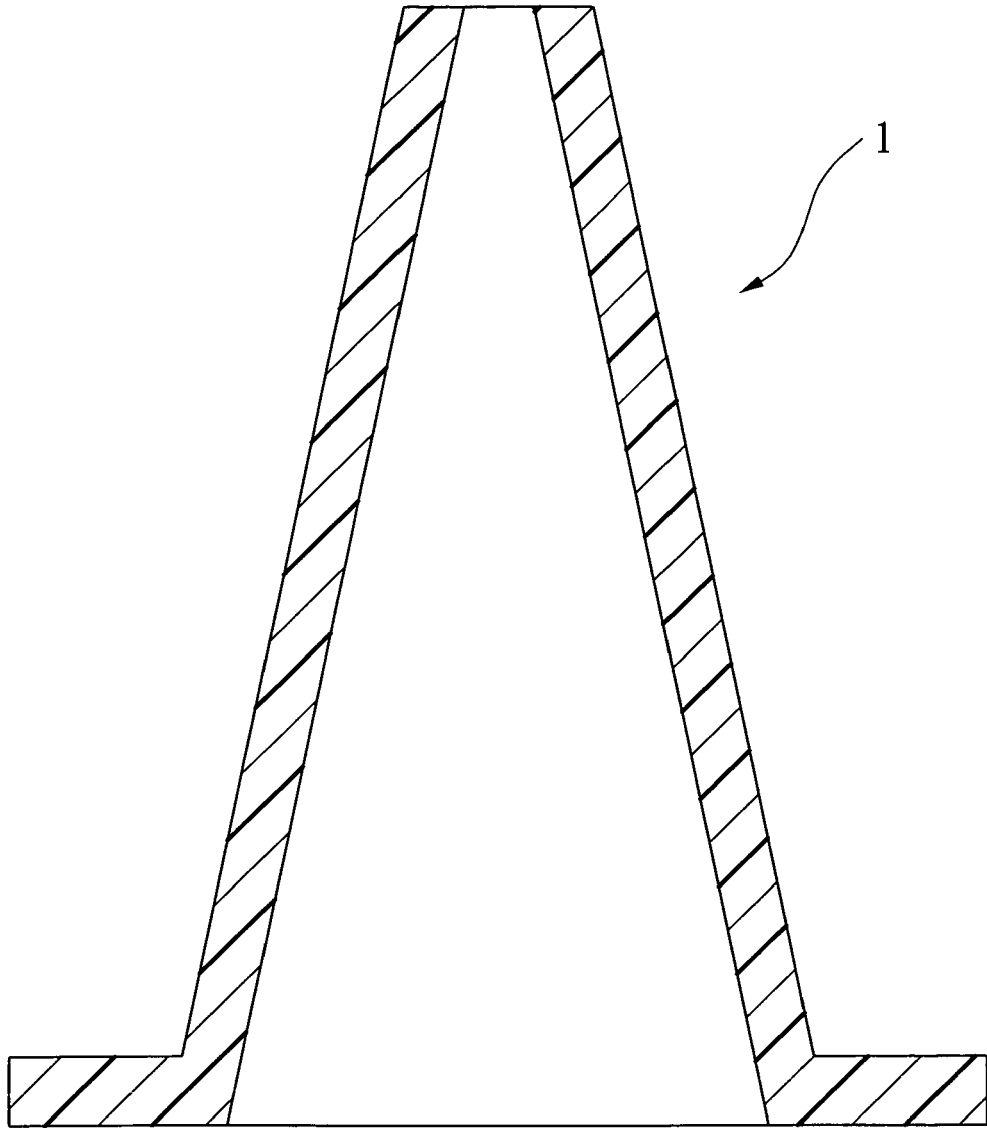


FIG. 1

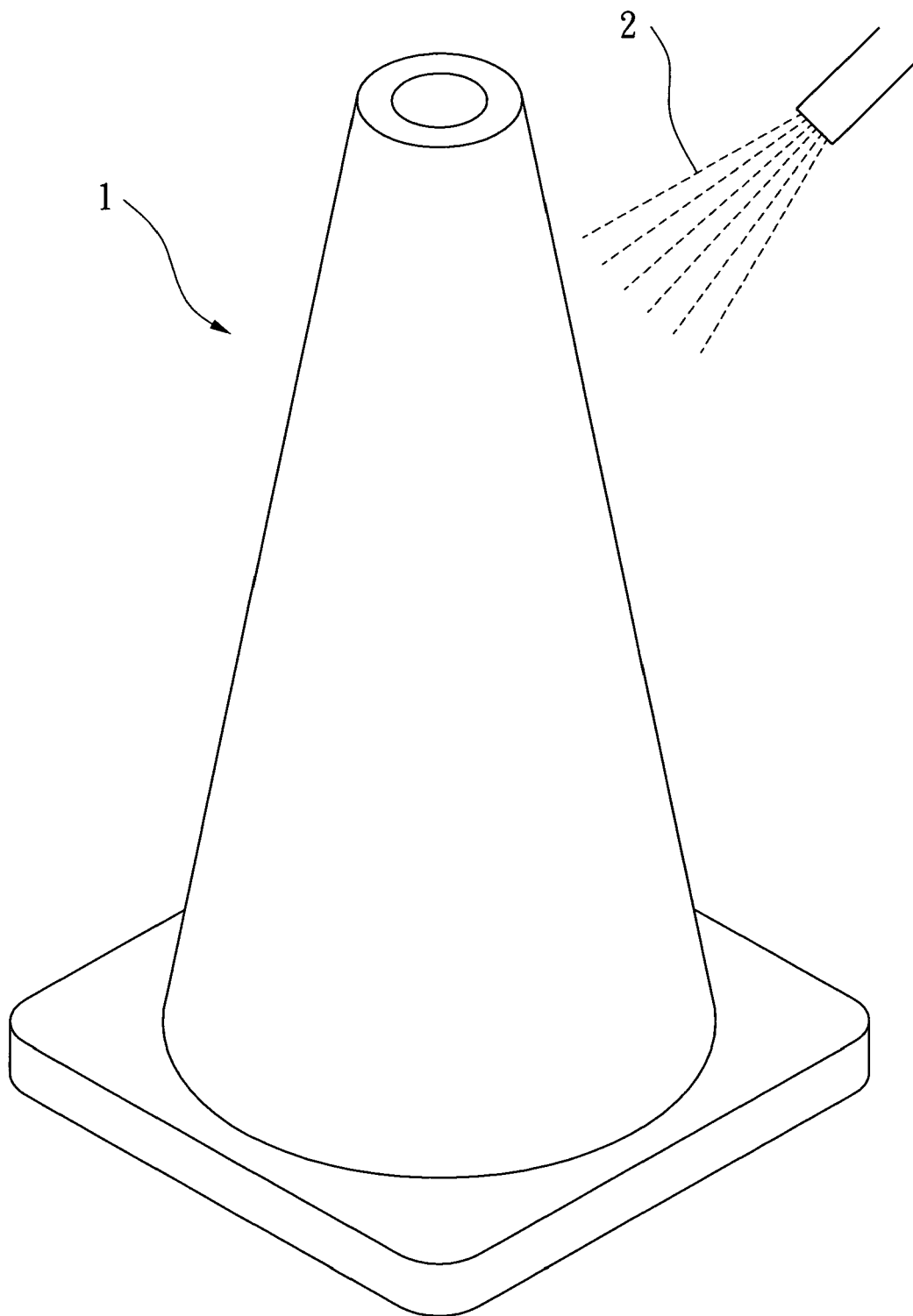


FIG. 2

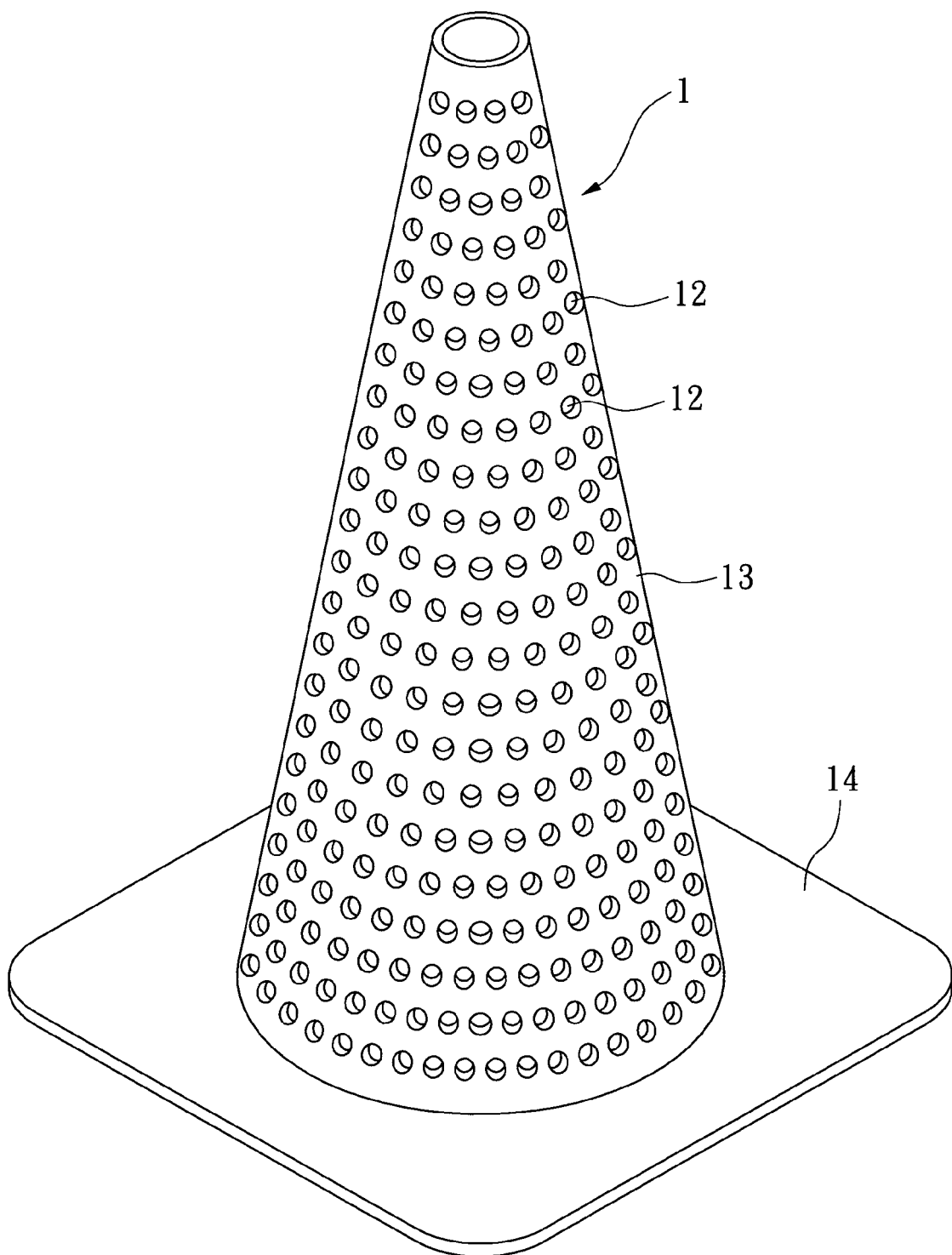


FIG. 3

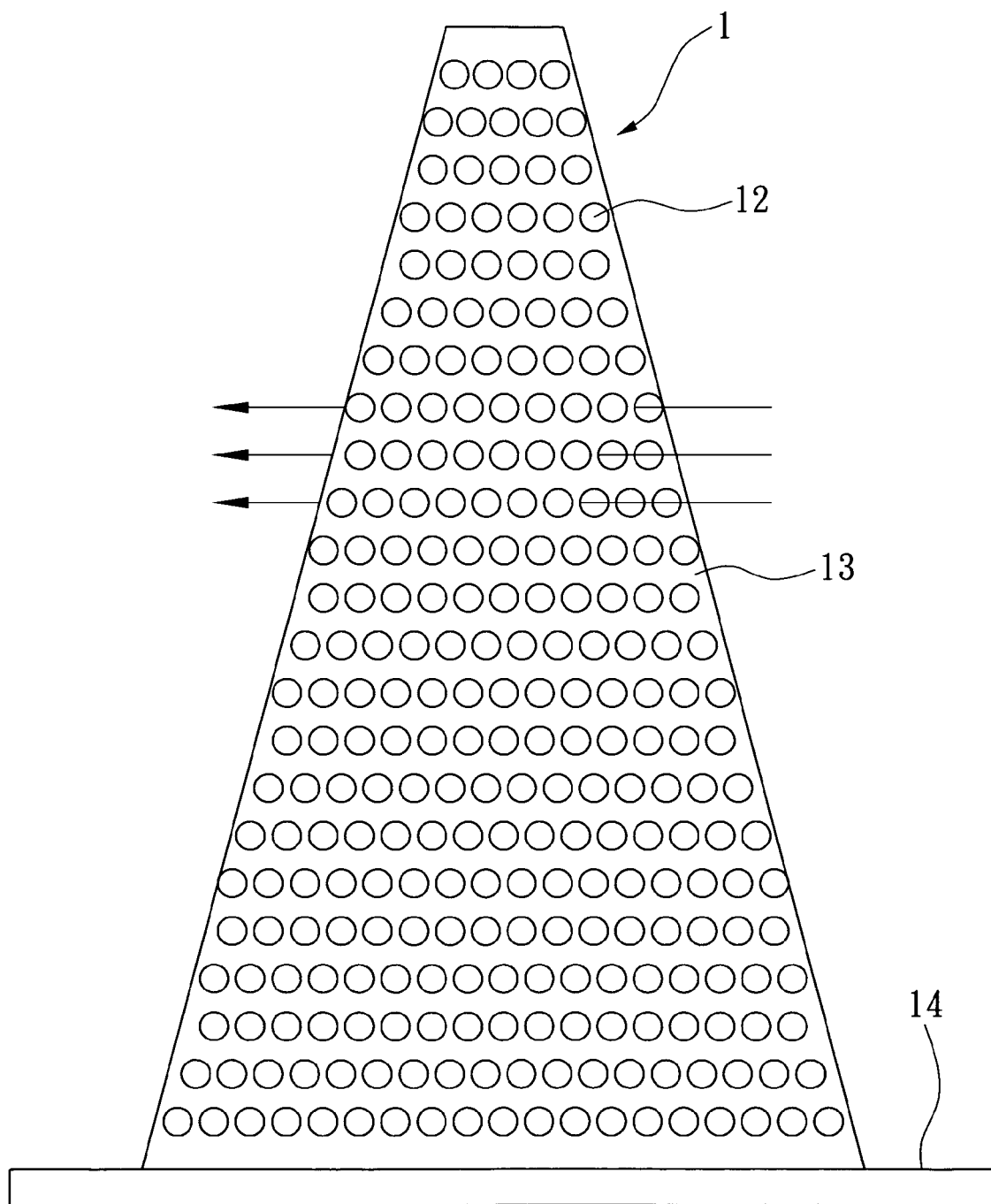


FIG. 4

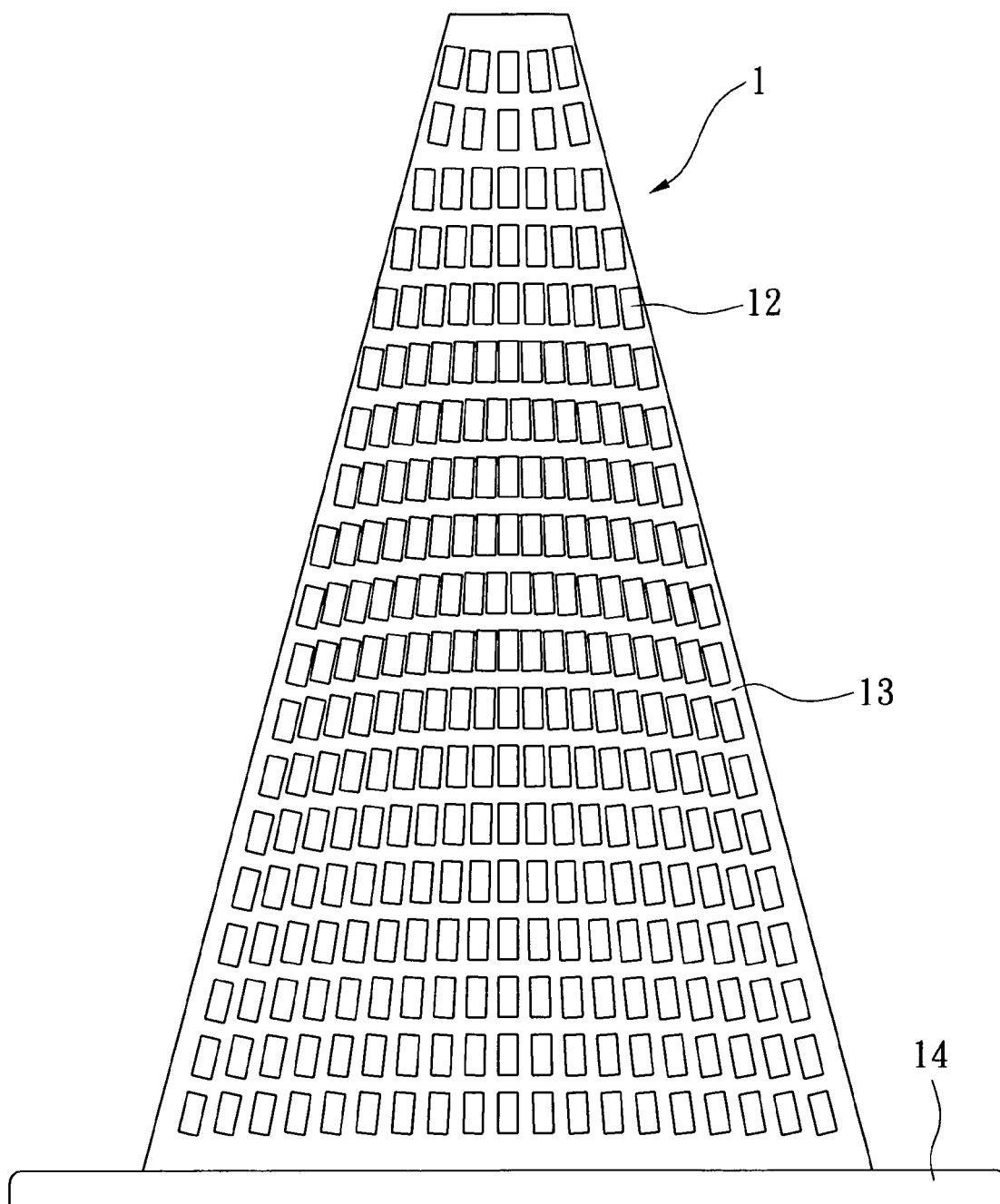


FIG. 5

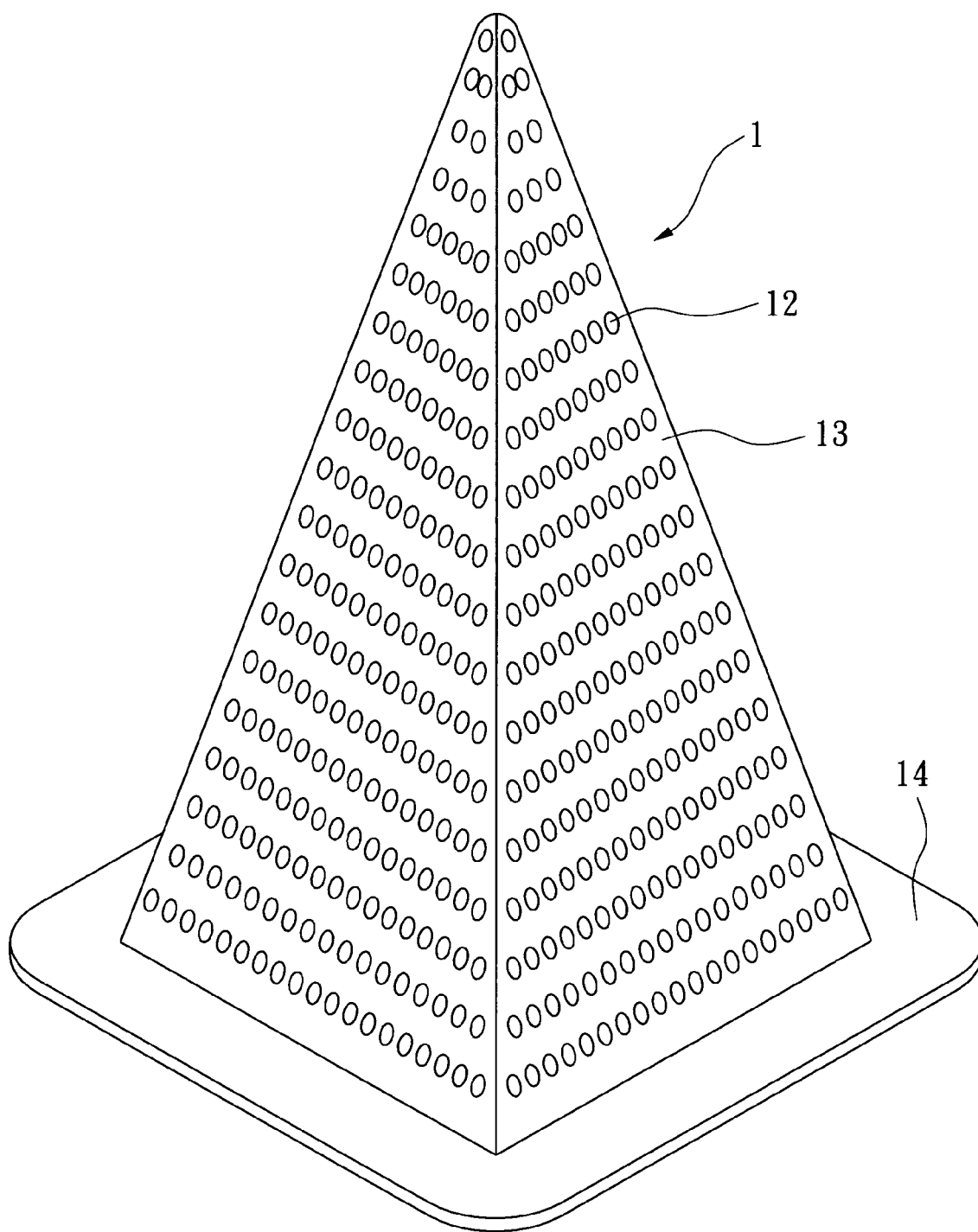


FIG. 6

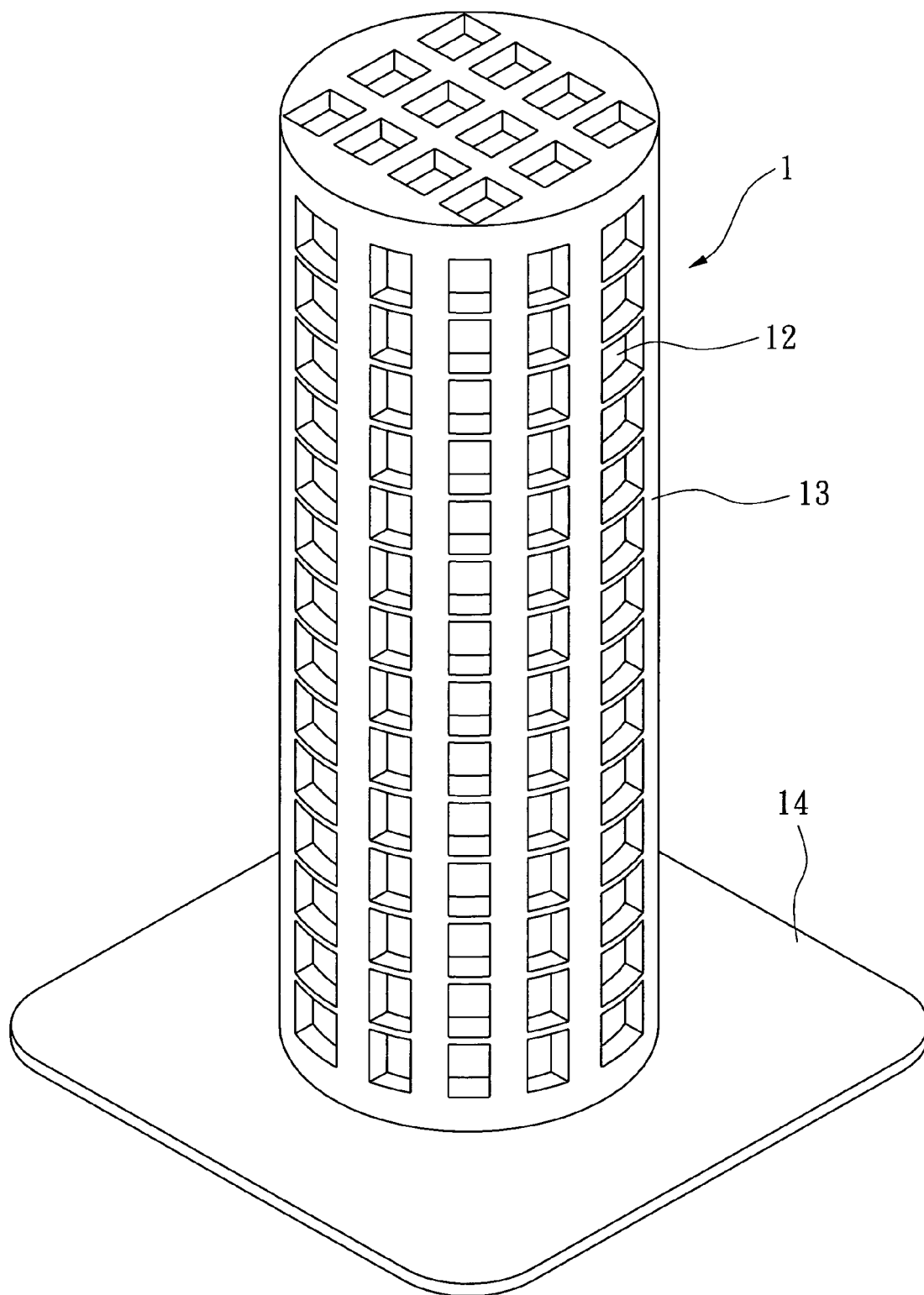


FIG. 7

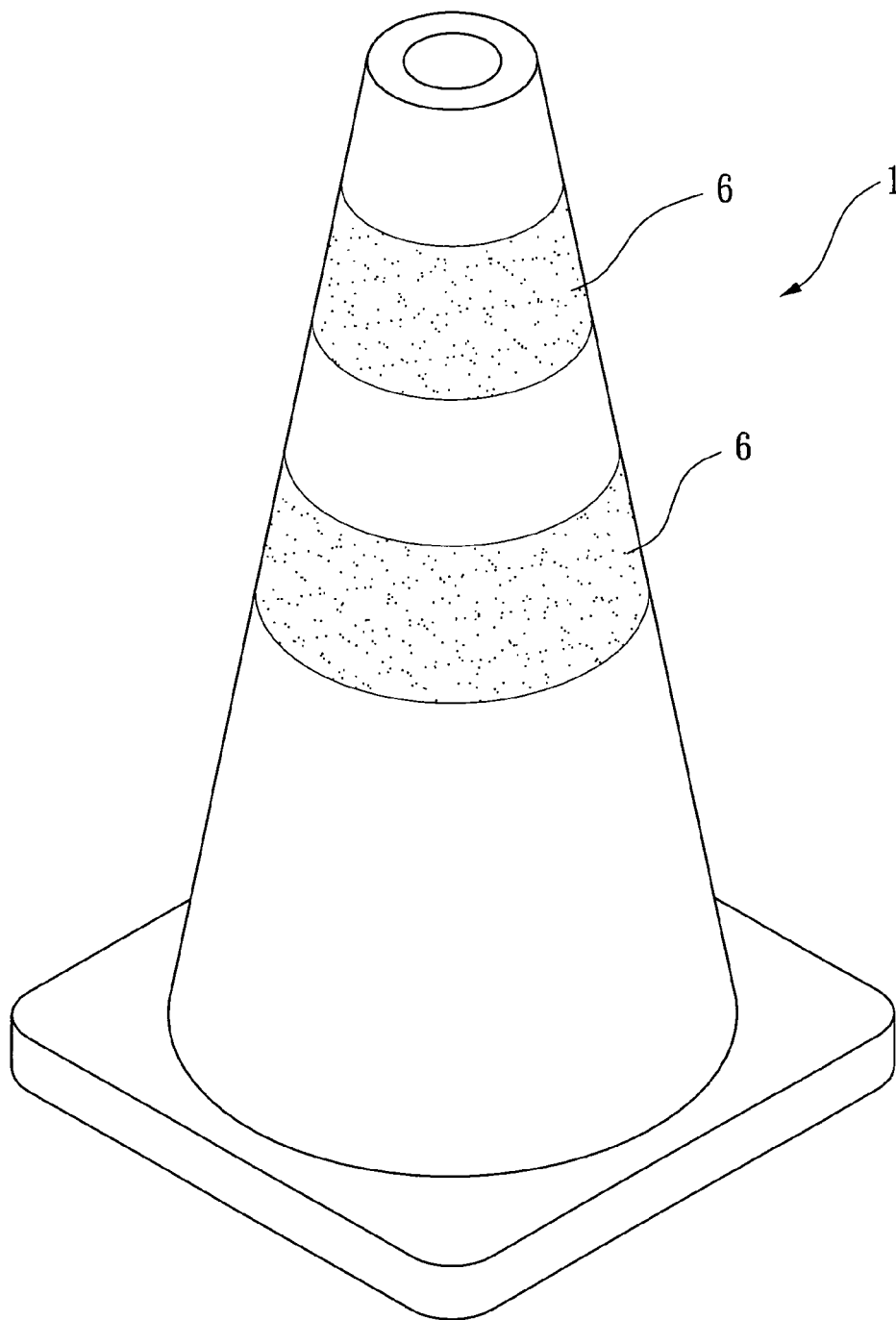


FIG. 8
PRIOR ART



EUROPEAN SEARCH REPORT

Application Number
EP 08 01 7807

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	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	1,5,8	INV. E01F9/012
Y	* the whole document *	6	
X	US 2 942 571 A (WHITE EARL E) 28 June 1960 (1960-06-28) * column 1, lines 16-29 *	9,13	
Y	WO 2006/126787 A (PARK JU MIN [KR]) 30 November 2006 (2006-11-30) * page 7, lines 15-18 * * pages 5-10; figure 5 *	6	
			TECHNICAL FIELDS SEARCHED (IPC)
			E01F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 March 2009	Examiner Flores Hokkanen, P
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 01 7807

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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17-03-2009

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2942571	A	28-06-1960	NONE	

WO 2006126787	A	30-11-2006	AU 2006250230 A1	30-11-2006
			EP 1885958 A1	13-02-2008
			JP 2008542585 T	27-11-2008
			KR 20050074348 A	18-07-2005
