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(54) **STACKABLE BOX**

(57) The invention relates to a stackable box with an inverted truncated pyramid shape, comprising a box body (1), with a base and respective walls (2), with the upper part open, and respective foldable flaps (3) on the upper part of at least a pair of facing walls (2), the flaps (3) being arranged horizontally on the inside of the box (1A) in a first position, and outside the vertical projection of the body of the box (1) in a second position. The connection of the flap (3) to the respective wall (2) thereof can be carried out by means of a hinge (4) or a thin strip (5). The flaps (3) can have respective tabs for locking onto the walls (2) adjacent to the wall supporting the flap (3).

Figure 1

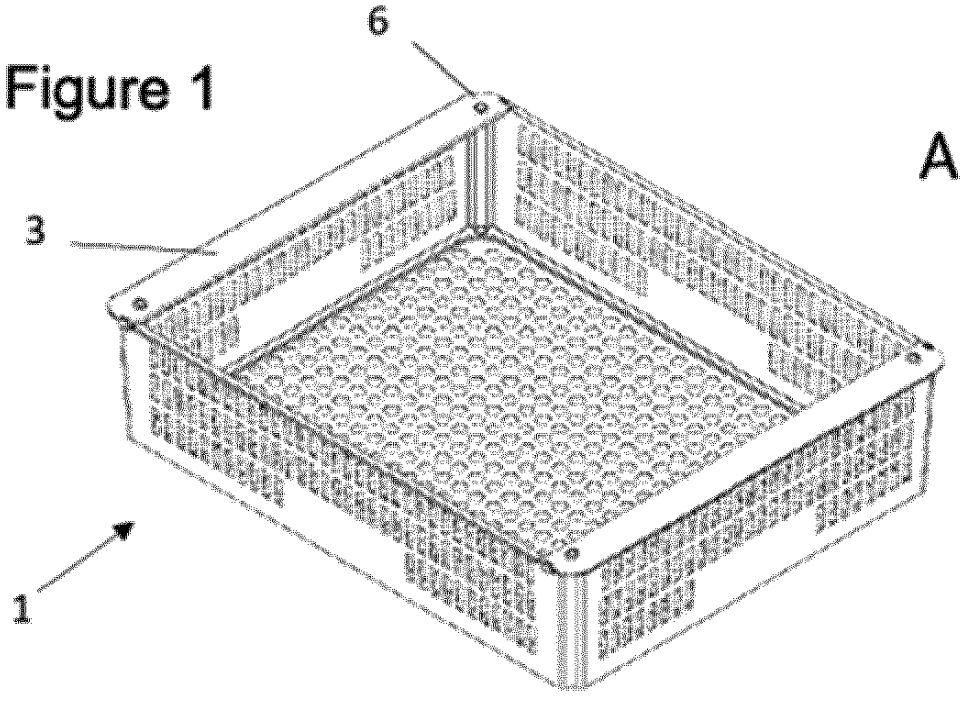

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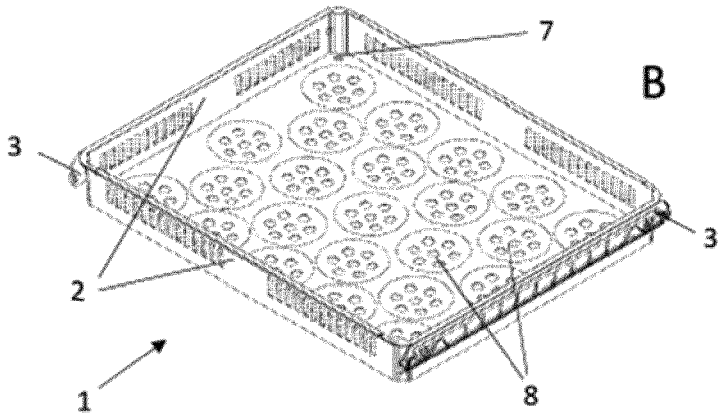
Figure 1



Description

Field of the Art

[0001] The present invention relates to a stackable box for a variety of products, primarily fresh food (vegetables, breads, fruits, fish, etc.), which can be fitted into other similar boxes when it is empty.

State of the Art

[0002] Rectangular boxes made of plastic material and without a top lid used for loading fresh food such as vegetables, fish, etc. are known in the state of the art. To that end, there are arranged on a side of the loading point, filled, and transported to the next location, usually a logistics center, a food market, etc. Once empty, they must return to the starting location to initiate the cycle again.

[0003] These empty boxes must be able to be piled up with minimum space. To that end, asymmetrical boxes have been developed, such that when the upper box has the same orientation as the lower box, it is introduced therein, reducing the total volume, but when it is rotated, it is supported on the upper part thereof, which allows arranging boxes that are full with alternating orientations in columns without affecting the content.

[0004] A system capable of obtaining those same advantages but by moving only small elements instead of the entire box which can be quite heavy when it is full is also known. This system is advantageous as it solves the preceding problems, although it is still susceptible to improvement. Specifically, the flaps project from the sides when the box is open, increasing the space used in the transport thereof, and causing the most fragile part of the box to be arranged in a cantilever manner.

Brief Description of the Invention

[0005] The invention consists of a stackable box according to the claims. The invention solves the problems of the state of the art with its different embodiments.

[0006] The stackable box has an inverted truncated pyramid shape and comprises a box body, with a base and respective walls. The box body has the upper part open, and there are arranged in at least one pair of facing walls respective foldable flaps in the upper part. The flaps have a first position in which they are arranged horizontally on the inside of the box, and a second position in which they are arranged outside the vertical projection of the box body. In other words, in a first position, they make the upper opening of the box body smaller to prevent the entry and fitting of a second similar box, whereas in the second position, they do not prevent the entry but rather is located close to the outer part of the corresponding wall. The flaps are therefore located such that they adhere to or converge with the walls, below the support wall, without increasing the space used by the box.

[0007] The box body therefore has an angle of inclination in each wall, which will preferably be the same, and a thickness of the wall. The width of the flaps measured from the articulation to the wall to the free end will be such that the projection over the horizontal of the flap in the second position (or the open position) is approximately the thickness of the upper edge of the corresponding support wall. As will be shown below, this thickness will be measured from the rotating shaft of the flap to the inner side of the wall. To facilitate same, the box may have an upper rim which increases the thickness of the wall in the upper part, and allows arranging the articulation of the flap in a cantilever manner.

[0008] This width of the flaps allows the nested arrangement to be the same or similar, in position, to a hypothetical nested arrangement of the independent box bodies. In other words, it does not change the height or the width of the nested arrangement.

[0009] The flap can be attached to its respective wall through one or more hinges or through one or more thin strips made of the same material, produced during box manufacture (generally by the injection of plastics). This second type of attachment is generally referred to as "film attachment" and the flap and the corresponding wall therein in fact form a single body.

[0010] The flaps preferably have respective locking flanges on the walls contiguous to the one supporting the flap.

[0011] Likewise, the flap can have protrusions and notches complementary to the notches and protrusions made in the base of the box body. The flaps can also have ribs to increase their strength or favor the fall of the product.

Description of the Drawings

[0012] The following drawings are included to better understand the invention.

Figure 1 shows the view of two box models according to respective embodiments, where Figure 1A shows the flaps in the closed position or first position, and Figure 1B shows the flaps in the open position or second position.

Figure 2 shows the detail of a third embodiment of the box with a hinge.

Figure 3 shows the detail of another embodiment of the box with a film.

Figure 4 shows a perspective view of another embodiment of the stackable box, where the posts and cut-out areas are seen.

Figure 5 shows the detail of several boxes of the embodiment with the flaps in the open position and nested together (A) and in the closed position and stacked on top of one another (B).

Figure 6 shows the section explaining the position of the flaps in the first (closed) position and in the second (open) position, where the difference in height in both cases is seen.

Embodiments of the Invention

[0013] An embodiment of the invention will be described briefly below as an illustrative and non-limiting example of said invention.

[0014] The box of the invention comprises a box body (1), the base of which usually has a rectangular or square shape, and with the upper part completely open, i.e., its walls (2) have no element whatsoever protruding through the top part towards the inside of the box, with the exception of a possible reinforcement rib or the like which affects the entire height. In any case, the walls (2) must allow the box bodies (1) to fit into one another, for which it is preferable for the walls (2) to be slightly inclined, the box body (1) having an inverted truncated pyramid shape. The shape of the base of the pyramid is irrelevant, where it can be any polygon or curved figure.

[0015] There will be arranged in at least one pair of opposite walls (2) of the box body (1) respective foldable flaps (3) which, in a first position or closed position, are arranged almost horizontally and on the inside of the box. In that first position (depicted in Figure 1A), when a box is placed on top of the other, the upper box will be supported on the flaps (3) of the lower box.

[0016] The flaps will have a second position or open position (depicted in Figure 1B) in which they will be arranged outside the box, i.e., outside the vertical projection of the box body (1). Specifically, they will be arranged close to the corresponding wall (2) on the outer part thereof. The flaps (3) may swing any number of degrees between the two positions. Therefore, the second position may be oriented downwards after a rotation of more than 270°.

[0017] The flap (3) can be articulated to the corresponding wall (2) by means of one or more hinges (4) or by means of one or more thin strips (5) made of the same material of the box. Since it is thin, it will be flexible and allow both positions. This strip (5) must achieve a balance between flexibility and breaking strength. When the attachment is by a hinge (4), the flaps (3) can be made of a material different from that used in the box body (1).

[0018] The part of the flap (3) contacting the walls (2) contiguous to the one supporting it may comprise one or more locking flanges (10). These locking flanges (10) make it easier to maintain the closed position of the flaps (Figure 1A) as long as no other box is stacked on top.

[0019] Protrusions (6) and/or notches (7) as well as ribs can be made in the flap (3) to help centering the upper box, which will have in the base thereof complementary notches and protrusions. In this manner, once a box is placed on top of the other, sliding will not occur because the protrusions (6) of the base have been introduced into the notches (7) of the flap (3) and/or vice versa.

[0020] Considering Figures 5 and 6, the size or width that the flaps (3) must have with respect to the support wall (2) is seen. It depends on the thickness of the wall (2) which can be made larger in the upper part thereof with a rim.

[0021] Preferably, it will be assured that manufacturing tolerances do not prevent the nested arrangement.

[0022] For the flap (3) to be perfectly hidden from sight, it is recommendable for the shaft of the articulation, i.e., either the hinge (4) or the strip (5), to be arranged in a slightly cantilever manner with respect to the wall (2).

[0023] A fastener may be arranged to assure the position between the flap (3) and the corresponding wall (2), for example by means of collaboration between a protrusion (6) in the flap (3) and a point of the wall (2), among other solutions. It is also possible for the flap (3) to be fixed in place by the mere placement of the box in a nested position.

[0024] The box will be made of any suitable material and color, with thermoplastics being the most common material. It may also be made of other materials. Reinforcement ribs, lightening elements or openworks, handles, height recesses may also be placed in the side walls (cut-out areas), as is known in the state of the art, without those applications deviating from the invention. It is of interest to make depressions and protrusions in the walls (2) so as to increase the strength thereof, for example with corrugations or posts, as well as to provide cut-out areas (9): planar areas (11) without openworks or ribs therein for placing labels or card holders or for printing logotypes. The box can have rims or ribs in the mouth and in the base to increase its strength.

[0025] Likewise, the bottom may have openworks for the discharge of liquids or passage of air, or cavities or shapes (8) for placing products such as fruits and vegetables. These shapes (8) will be similar to the fruit or element for which the box is intended.

[0026] The invention is applicable to a box body (1) of any shape as long as it has two parallel opposite walls (2) for fixing the flaps (3).

Claims

1. A stackable box with an inverted truncated pyramid shape, **characterized in that** it comprises a box body (1), with a base and respective walls (2), with the upper part open, and respective foldable flaps (3) in the upper part of at least one pair of facing walls (2), with a first position in which the flaps (3) are arranged horizontally on the inside of the box, and a second position in which they are arranged under the vertical projection of the support wall (2) supporting the box body (1) and close to the wall (2), the width of the flap (3) being such that the projection thereof over the horizontal in the second position is less than or equal to the thickness of the upper edge of the support wall (2).

2. The stackable box according to claim 1, wherein the flap (3) is attached to its respective wall (2) by one or more hinges (4).

3. The stackable box according to the preceding claim, wherein the flaps (3) and the box body (1) are made of different materials.

4. The stackable box according to claim 1, wherein each flap (3) forms a single body with its respective wall (2), comprising a thin strip (5) between both.

5. The stackable box according to claim 1, wherein at least one wall (2) has reinforcement posts.

6. The stackable box according to claim 1, wherein the flaps (3) have respective locking flanges on the walls (2) contiguous to the one supporting the flap (3).

7. The stackable box according to claim 1, having in the flap (3) protrusions (6) and/or notches (7) complementary to the notches and protrusions made in the base of the box body (1).

8. The stackable box according to claim 1, wherein the base and/or the walls have openworks for the discharge of liquids or passage of air.

9. The stackable box according to claim 1, wherein the base has cavities or shapes (8) for placing products.

10. The stackable box according to claim 1, wherein the flaps (3) are attached to the support wall (2) by an articulation the shaft of which is arranged in a cantilever manner.

11. The stackable box according to claim 1, wherein in the second position the flaps (3) are attached to the outer part of the support wall (2) by a fastener.

12. The stackable box according to claim 1, wherein the flaps (3) have locking flanges (10) in the first position.

Figure 1

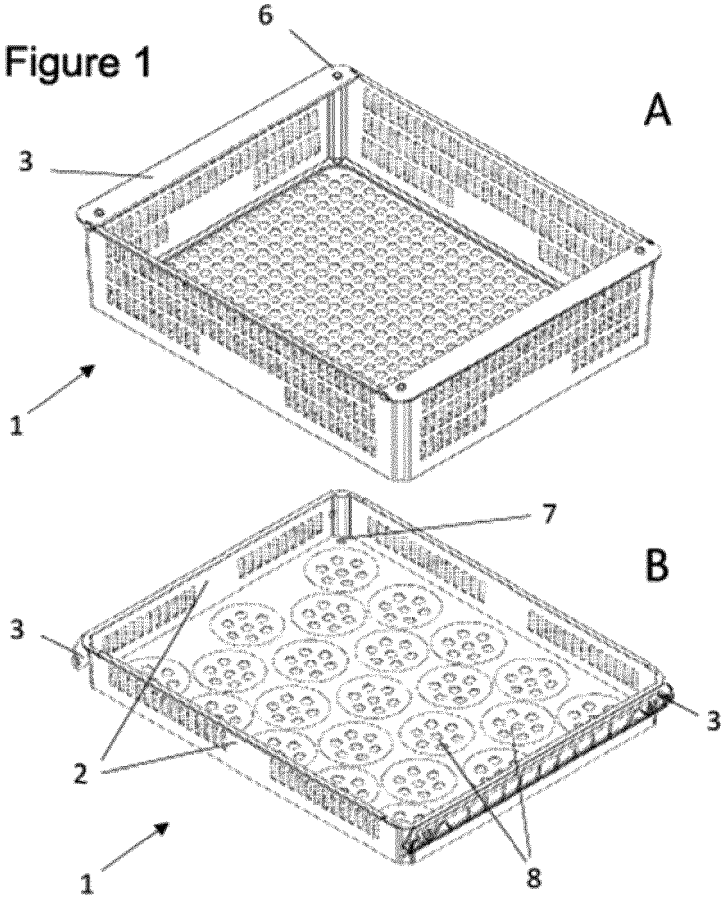
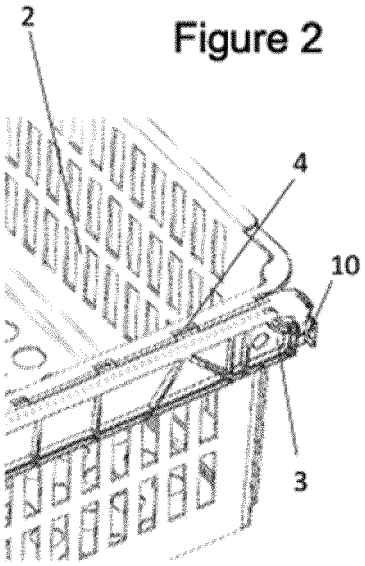


Figure 2



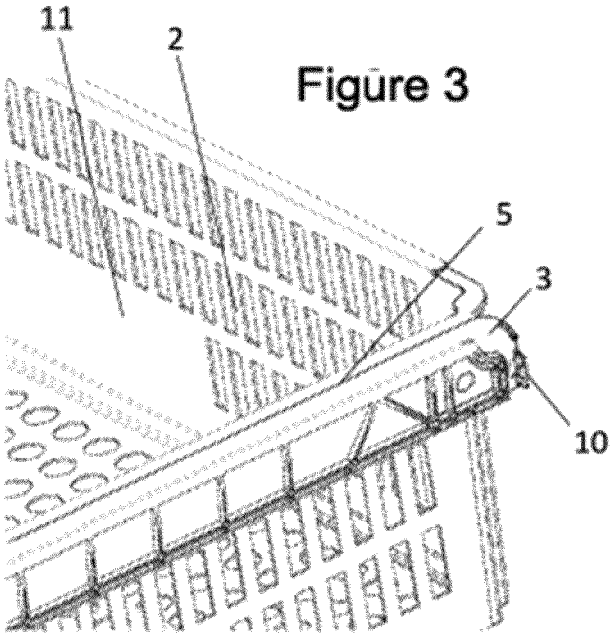


Figure 3

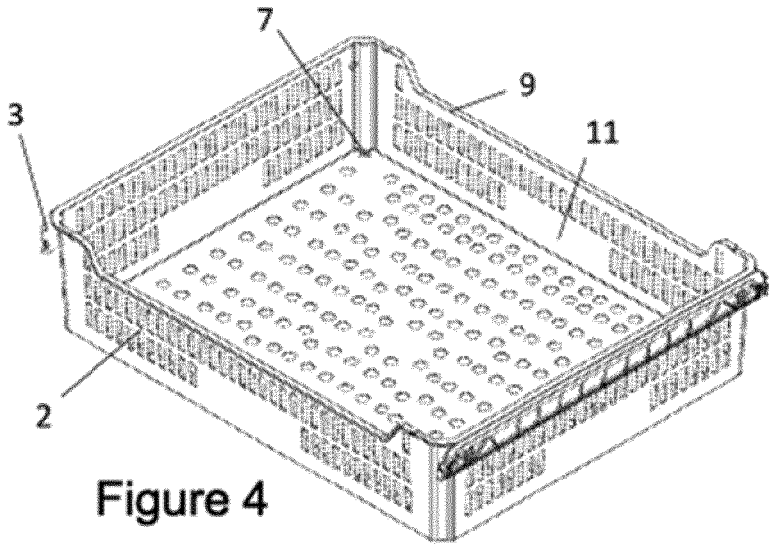


Figure 4

Figure 5

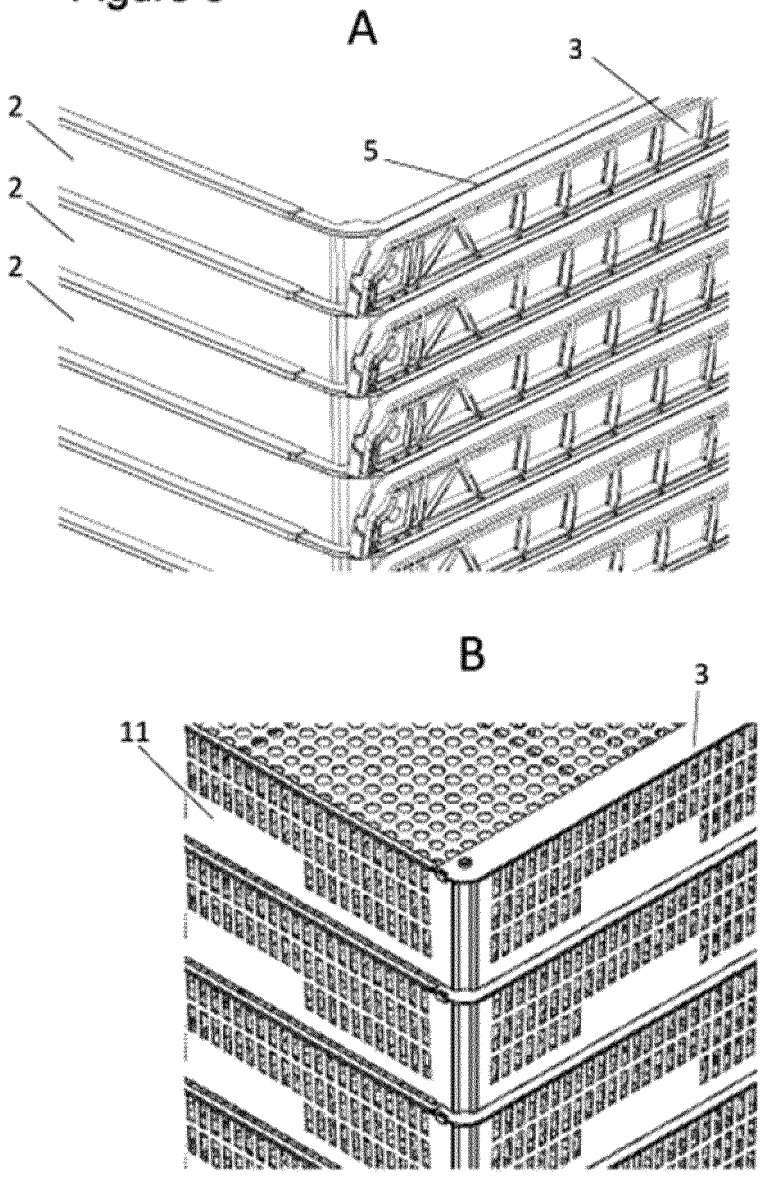
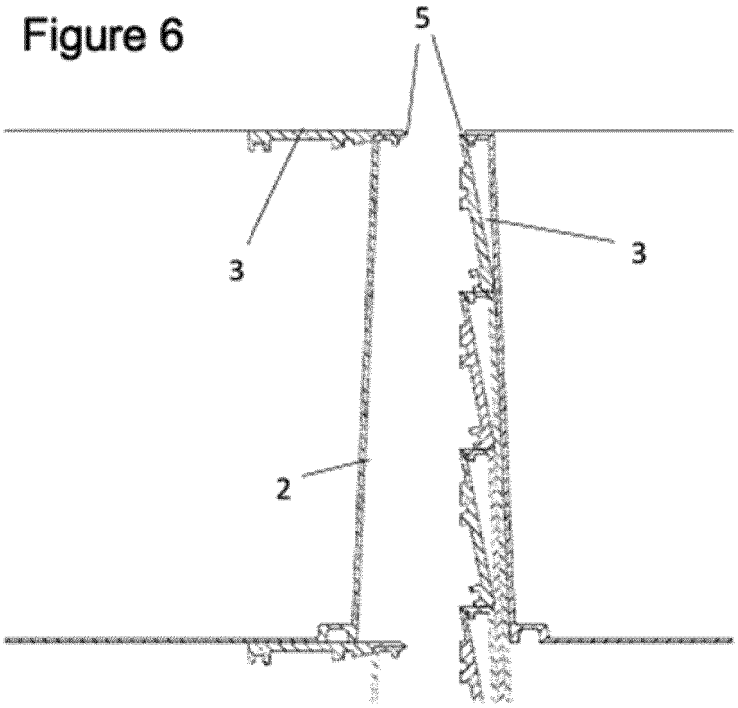


Figure 6



INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2016/070879

A. CLASSIFICATION OF SUBJECT MATTER

B65D21/06 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	WO 0051900 A1 (ARCA SYSTEMS AB; BROADLEY MIKE; GEDDA ANDERS) 08.09.2000, the whole document.	1-12
A	US 2175390 A (HARRISON GEORGE E) 10.10.1939, the whole document.	1-12
A	DE 3521894 A1 (SEITZ PETER) 02.01.1987, abstract; figures.	1-12
A	GB 2235429 A (LIN PAC MOULDINGS) 06.03.1991, abstract; figures.	1-12
A	US 5360114 A (SCHAEFER GMBH FRITZ) 01.11.1994, abstract; figures.	1-12

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
09/02/2017	**(16/02/2017)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer F. Riesco Ruiz Telephone No. 91 3496869

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2016/070879

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5452847 A (US CORRULITE CORP) 26.09.1995, abstract; figures.	1-12

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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US5452847 A	26.09.1995	NONE	

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