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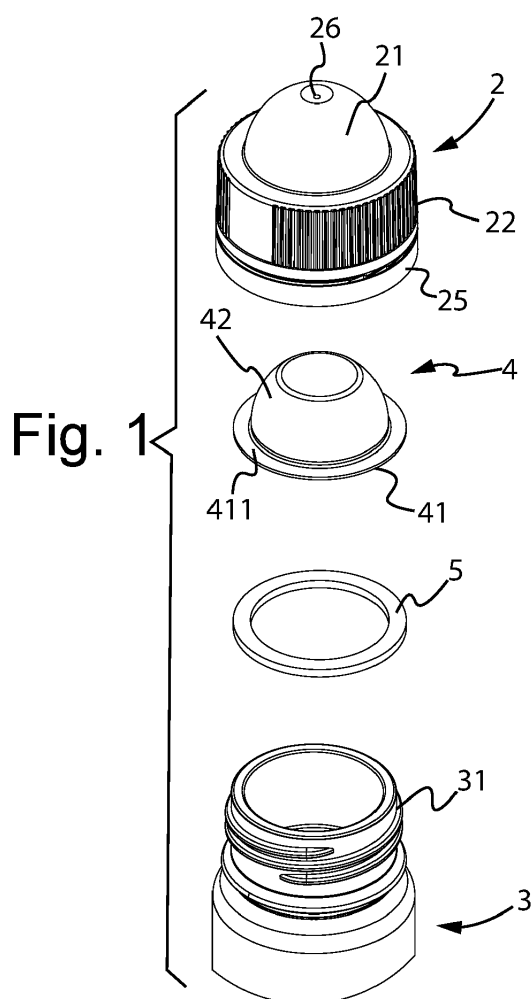
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(54) **BOTTLE CAPPING DEVICE ADAPTED FOR THE STORAGE OF A SUBSTANCE PACKAGED IN A CAPSULE AND CONTAINED IN A CAVITY THEREIN**

(57) Capping device (2) associated to a bottle (3) comprising a cylindrical portion (21) innerly hollow that is associated to the bottle mouth and a concave upper portion (22), so as to create inside the same a cavity to contain a first substance to be mixed with a second substance present within the bottle.

The device comprises a waffle (4) containing said first substance, realized by a polycoupled material and inserted within said cavity; said concave portion is comprised of a flexible material so that when pressed squeezes the content cavity against the waffle, breaking the same and letting the first substance fall within the bottle.



Description

[0001] The present invention relates to a bottle capping device in which a first substance is contained which must be mixed with a second substance contained in the bottle which must be kept separate from one another until the moment in which they are used, when they must be mixed together.

[0002] There are multiple technological fields in which such device can be used, starting from the pharmaceutical sector, in which the drug must be prepared only at the time of use by mixing the two substances. Other sectors in which separators of substances are used are the food, cosmetics and trichology sectors.

[0003] The mixing operation normally takes place by opening the bottom of the capsule or of the housing of the capping device in which the first substance is located, which falls into the bottle, becoming mixed with the second substance.

[0004] The operation of opening the bottom takes place according to various systems.

[0005] For example, patent EP2922767 in the name of the same applicant describes a tapping device for a bottle comprising an outer concave cap comprising an edge portion adapted to seal the mouth of the bottle and a deformable concave upper portion. A chamber is envisaged inside such device for containing said first substance closed at the bottom by a heat-sealed film. The device further comprises an element for breaking such film of the chamber comprising a stem which, at the upper end thereof, is attached to the inside of the mentioned deformable portion of the cap and is able to move downwards after pressure has been applied on said deformable portion of the cap. Such breakage element has at the lower end thereof teeth that can break said film.

[0006] Patent EP3110389B1 (Montefarmaco) describes a bottle comprising a container of a fluid and a dosing cap for a soluble substance in said container. Said soluble substance being stored in a frangible capsule housed in a relevant seat inside said dosing cap at the mouth portion of said container.

[0007] The upper portion of the cap comprises side walls for the lateral containment of said capsule and an upper roof portion for the upper containment of said capsule which is movable under the manual action of a user between a raised rest position, in which it is in contact without compression against said capsule, and a lowered work position in which it compresses said capsule in a collapsed configuration, breaking it and making it release its contents into the container. The side walls are configured so that during the compression of said upper roof portion they do not penetrate into said dosing cap, passing from a substantially stretched configuration when said upper roof portion is in the raised position, to a configuration that is substantially folded onto itself towards the outside when said upper roof portion is in the lowered position.

[0008] Patent EP2697135 (Lameplast) describes a

bottle having a container for containing a liquid substance and a closing cap for such container. Between the cap and the stopper of the container a capsule is provided containing the second powdered substance to be mixed with the first liquid contained in the container and a coupling bushing of the capsule to the mouth of the container. The cap is internally concave and when it is coupled to the mouth of the container it houses also the mouth and the capsule therein. The latter is of the so-called "blisterable" type, i.e. with a crushable dome and a flat bottom that is frangible due to the pressure of the dome. The cap is provided with a presser cylinder which when pushed by the user penetrates into the cap and crushes the dome of the capsule making the bottom thereof break.

[0009] EP2720617 describes a container unit, more specifically a container unit comprising: a container for storing a sample of fabric, said container comprising a bottom, a lid adapted to engage with said container. The lid comprises an upper element comprising a receptacle adapted to contain a preservation agent, a gasket for sealing said receptacle, a perforation element for breaking the seal which moves downwards. The container unit has a first and a second position, in the first position the container is isolated from the receptacle and in the second position fluid communication is provided between the recipient and the container. The invention further relates to a method for preserving a tissue sample.

[0010] Patent application WO2007050026 describes a two-compartment container for adding a first component to a second component.

[0011] Such container comprises

- a first compartment containing a first component, said first compartment having an intact upper layer and a lower layer, said lower layer being flat and easily frangible without using a punch structure, said upper layer being arched upwards to remain intact pushing downwards.
- a second compartment containing a second component, said second compartment having a cap and a flexible dome (20) which is part of the cap, but not a specific punch, and said flexible dome being positioned above said first compartment.

[0012] The depression of said flexible dome causes the intact upper layer of the first compartment to be pushed against the lower layer of the first compartment, breaking the lower layer without using a punch and without breaking the upper layer, releasing the first component into the second compartment without opening a compartment outside the container.

[0013] Said first compound is sensitive to humidity, both the upper and lower layers are made with a sheet of aluminium, and the upper layer is thicker than the lower one. Furthermore, said first compartment comprises an aluminium sheet with a lacquered surface inside, and a plastic layer on the outside.

[0014] The applicant has noted that in such systems

of the prior art the cap or capping device requires a special pressure device (piston, stem) to pierce the capsule.

[0015] In the same way, the action of breaking the capsule can sometimes be problematic as the user acts on an element which then in turn acts on the capsule.

[0016] The present invention proposes a tapping device for a bottle that is simple and effective at the same time.

[0017] An aspect of the present invention relates to a tapping device for a bottle having the characteristics of the appended claim 1.

[0018] The features and advantages of the tapping device for a bottle according to the present invention will be more apparent from the following description, which is to be understood as exemplifying and not limiting, with reference to the schematic attached drawings, in which:

- figure 1 shows a perspective exploded view of the tapping device according to the present invention and of a bottle;
- figure 2 shows the steps of filling the tapping device with the first substance;
- figures 3a-3d illustrate the steps of preparing and using the mixture between the two substances in the bottle according to the present invention;
- figure 4 illustrates a perspective view of the closure device after the closure element has been fractured and the first substance has been inserted into the bottle;
- figure 5 illustrates an enlarged detail of the device during the crushing phase of the waffle.

[0019] With reference to the appended figures, an embodiment of the tapping device 2 is illustrated, which is associated with a bottle 3 for example with a cylindrical shape. The present invention can be equivalently applicable to bottles with different shapes.

[0020] Such first and second substances can be for example comprised by powder, liquid, granulate or other substances to be mixed with liquid. In detail, the tapping device comprises an innerly hollow cylindrical portion 21 and a concave upper portion 22, preferably cap shaped, so as to create inside the same a cavity to contain a first substance to be mixed with a second substance present within the bottle.

[0021] The internal cylindrical portion comprises a thread 23 screwed onto a corresponding thread 31 provided on the mouth of the bottle 3.

[0022] Inside the aforementioned cavity, a waffle 4 is housed containing the first substance. The waffle is a package, made by means of a polycoupled material used mainly for pharmaceutical products. It generally comprises a base 41, for example of heat-sealed aluminium, and a dome 42, for example of transparent plastic material, coupled together so as to form a housing in which the first substance is contained. Alternatively, both the base and the dome can be made of aluminium.

[0023] The waffle is housed inside the cavity of the

device by matching the upper annular edge 411 of the base 41 with a corresponding annular edge inside the cylindrical portion of the device. In this way, the waffle is positioned with its domed part 42 inside the cap 21 of the device.

[0024] In addition, an annular gasket 5 is placed between the device and the mouth of the bottle to guarantee the seal with the liquid present in the bottle.

[0025] Such lower cylindrical portion of the device possibly comprises an annular closure seal 25 with the bottle, of the type of those present on the caps of drinks contained in plastic bottles.

[0026] The concave portion 22 is made of a flexible material which when pressed squeezes the dome 42 of the waffle, which in turn breaks the base 41, freeing the content of the waffle itself which falls within the bottle.

[0027] Advantageously a small punch 26 is provided above the concave portion, said small punch facing towards the inside of the cavity, and penetrating the same cavity, which helps to fracture the lower closure element. Such punch is preferably made with a cross-shaped structure formed by two walls crossing each other.

[0028] Advantageously, the lower portion 22 comprises a plurality of ribs and/or grooves, substantially arranged vertically, adapted to facilitate the handling of the device during the container opening and closing operation.

[0029] The device according to the present invention operates in the following way.

[0030] The assembly step of the device on the bottle illustrated in figure 2 provides for the insertion of the waffle in the inner cavity of the concave portion, keeping the device in an inverted position. Subsequently, the gasket is inserted and the device is coupled to the bottle.

[0031] During use, the first operation to perform is a pressure on the top of the device (figure 3b), in order to fracture the base of the waffle, letting the first substance fall within the bottle. Then the bottle (figure 3c) is shaken to mix the two substances and form a uniform mixture and finally the tapping device (figure 3d) is unscrewed for using such mixture.

Claims

1. Capping device (2) associated to a bottle (3) comprising
 - a cylindrical portion (21) innerly hollow that is associated to the bottle mouth,
 - a concave upper portion (22), so as to create inside the same a cavity to contain a first substance to be mixed with a second substance present within the bottle,
 - a waffle (4) containing said first substance, realized by a polycoupled material and inserted within said cavity,
 - wherein said concave portion is comprised of a flexible material so that when pressed it squeezes the

cavity content against the waffle, breaking the same and letting the first substance fall within the bottle.

2. Device according to claim 1, wherein said waffle comprises a base (41) and a dome (42) coupled to each other so as to realize a housing within which the first substance is contained, said waffle being housed inside the cavity of the device by matching the upper annular edge (411) of the base (41) with a corresponding inner annular edge of the cylindrical portion. 5 10
3. Device according to claim 1, wherein on the top of the concave portion a small punch (26) is present facing towards the inside of the cavity, which penetrating into the cavity helps the fracturing of the waffle (4). 15
4. Device according to claim 3, wherein said punch is realized with a cross-shaped structure obtained by two walls crossing each other. 20
5. Device according to claim 1, wherein the concave portion is shaped like a cap matching with the dome shape of the waffle. 25
6. Device according to claim 1, wherein the cylindrical portion comprises an inner thread (23) which is screwed onto a corresponding thread (31) provided on the mouth of the bottle (3). 30
7. Device according to claim 1, wherein said first and second substances are for example powder, liquid, granulate or other substances to be mixed with liquid. 35

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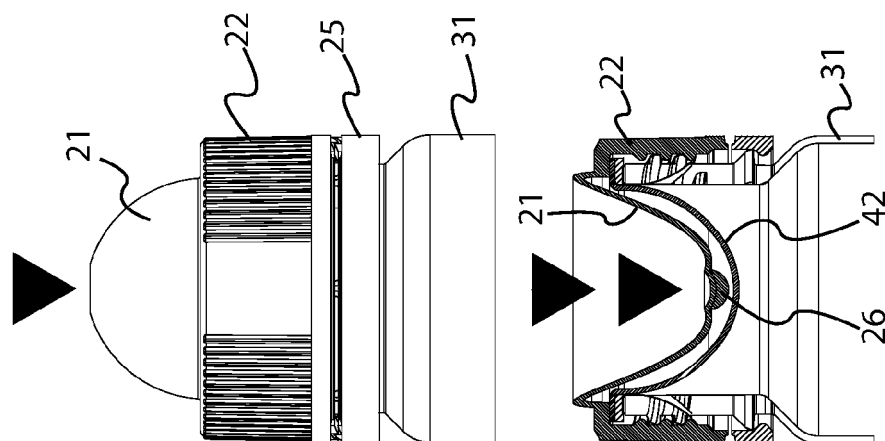
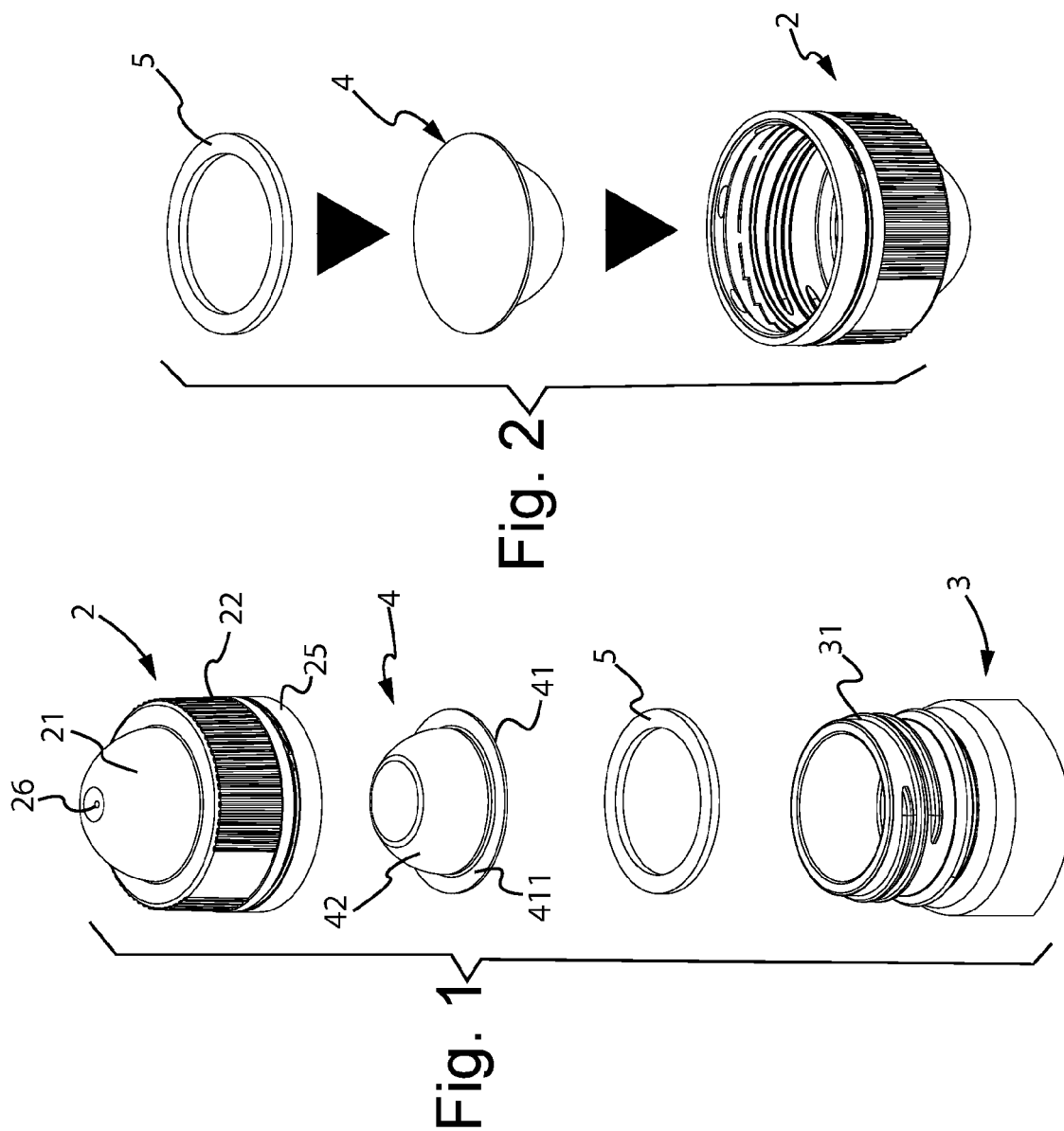
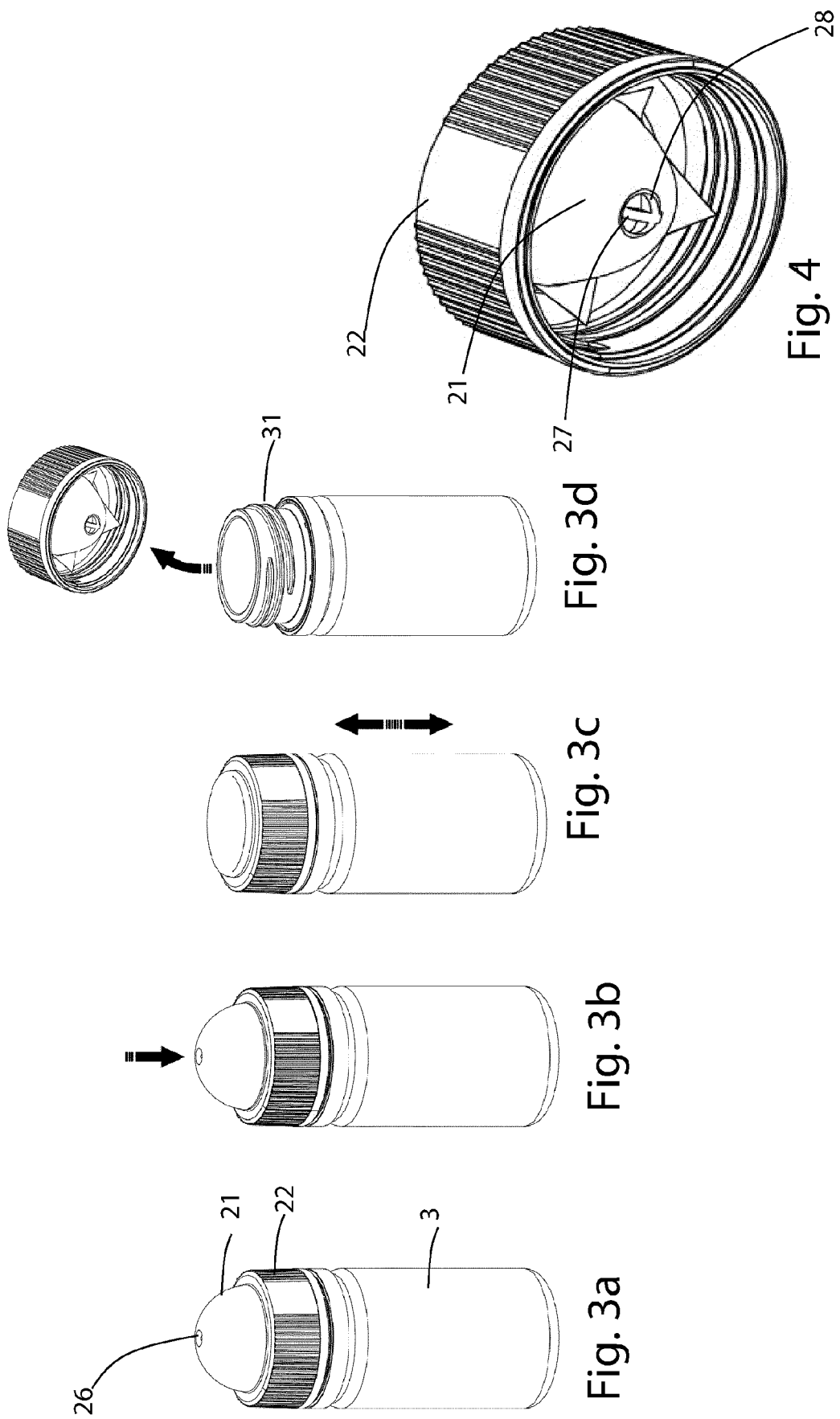


Fig. 5





EUROPEAN SEARCH REPORT

 Application Number
 EP 20 18 1510

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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	US 2017/355496 A1 (SEELHOFFER FRITZ [CH]) 14 December 2017 (2017-12-14)	1-3,5-7	INV. B65D51/28
Y	* Figures 1-4 and related text in description *	4	
Y	US 2014/027322 A1 (FONTANA ANTONIO [IT]) 30 January 2014 (2014-01-30) * Fig. 5, 6 and related description text *	4	
X	US 2014/209490 A1 (MCKEOWN TIMOTHY [US] ET AL) 31 July 2014 (2014-07-31) * the whole document *	1,2,5-7	
X	US 2007/090000 A1 (HJALMARSSON PER [SE]) 26 April 2007 (2007-04-26) * the whole document *	1,2,5-7	
X	US 2006/254935 A1 (PEARCE ALISDAIR G [NZ] ET AL) 16 November 2006 (2006-11-16) * the whole document *	1,2,5-7	TECHNICAL FIELDS SEARCHED (IPC)
			B65D A61J
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 23 November 2020	Examiner Pernice, Ciro
CATEGORY OF CITED DOCUMENTS 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 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			

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

EP 20 18 1510

5

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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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2017355496 A1	14-12-2017	EP 3233656 A1	25-10-2017
		JP 2017537033 A	14-12-2017
		US 2017355496 A1	14-12-2017
		WO 2016096710 A1	23-06-2016
US 2014027322 A1	30-01-2014	EP 2697135 A1	19-02-2014
		ES 2574822 T3	22-06-2016
		US 2014027322 A1	30-01-2014
		WO 2012140484 A1	18-10-2012
US 2014209490 A1	31-07-2014	US 2014209490 A1	31-07-2014
		WO 2014117124 A2	31-07-2014
US 2007090000 A1	26-04-2007	CN 101296852 A	29-10-2008
		CN 104670674 A	03-06-2015
		DK 1940696 T3	22-10-2012
		EP 1940696 A1	09-07-2008
		ES 2391651 T3	28-11-2012
		JP 5199877 B2	15-05-2013
		JP 2009513449 A	02-04-2009
		PL 1940696 T3	31-01-2013
		US 2007090000 A1	26-04-2007
		WO 2007050026 A1	03-05-2007
US 2006254935 A1	16-11-2006	AT 472488 T	15-07-2010
		AU 2003291790 A1	29-07-2004
		BR 0317935 A	29-11-2005
		CA 2512340 A1	22-07-2004
		EP 1583703 A1	12-10-2005
		JP 2006512257 A	13-04-2006
		MX PA05007255 A	30-09-2005
		NZ 541057 A	27-04-2007
		US 2006254935 A1	16-11-2006
		WO 2004060766 A1	22-07-2004

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 2922767 A [0005]
- EP 3110389 B1 [0006]
- EP 2697135 A [0008]
- EP 2720617 A [0009]
- WO 2007050026 A [0010]