(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 949 853 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
02.12.2015 Bulletin 2015/49

(51) Int Cl.:
E05G 1/02 *(2006.01)* ***G07D 11/00*** *(2006.01)*

(21) Application number: **14170026.0**

(22) Date of filing: **27.05.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(71) Applicant: **M.I.B. S.r.L.**
20121 Milan (IT)

(72) Inventor: **Fumanelli, Giuseppe Ezio**
I-20066 Melzo (Milan) (IT)

(74) Representative: **Lunati & Mazzoni S.r.L.**
Via Carlo Pisacane, 36
20129 Milano (IT)

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

(54) Anti-burglar device for banknote containers in particular for Bancomat, ATM, acceptors or the like

(57) Anti-burglar device (1) for a banknote container (2), in particular for ancomat, ATM, acceptors and the like, comprising: ignition means (3) suitable to ignite any explosive substances inserted in the container, so that said explosive substances are combusted before they reach a critical mass, and conveying means (4) of the atmosphere suitable to convey the gases and the like contained inside the container (2) to the ignition means (3).

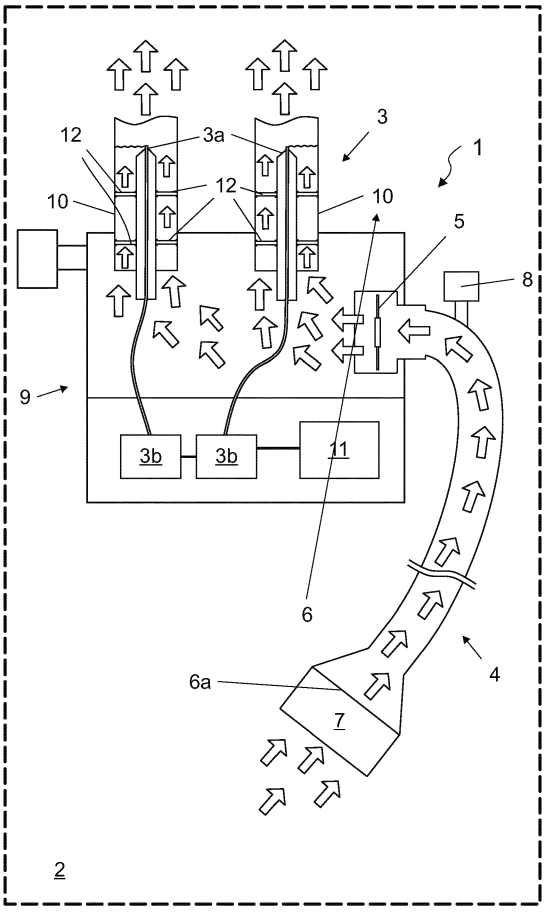


Fig. 1

EP 2 949 853 A1

Description

[0001] The present invention relates to an anti-burglar device for banknote containers in particular for Bancomat, ATM, acceptors or the like of the type specified in the preamble of the first claim.

[0002] Distributors of banknotes or valuables are currently known of, such as in particular ATMs or systems suitable to contain banknotes.

[0003] They comprise a container consisting of a safe suitable to contain banknotes and valuables and control means suitable to issue or receive banknotes and valuables to an authorised user. The issue of banknotes and valuables takes place after the recognition of the user by means of a card or the like, and takes place through a dispenser slot, communicating with the interior of the safe and suitable, as said, to issue or receive banknotes or valuables from an external user.

[0004] The dispenser slots are therefore generally aimed at public areas accessible to users and have a slit or the like, through which the banknotes and valuables pass, even collected in bundles.

[0005] As known, a general problem concerning the protection of containers such as in particular Bancomat, ATMs and the like is how to prevent an intrusion perpetrated by the insertion therein of explosive substances or products, such as gases, mixtures, liquids, powders, aerosols, etc.

[0006] These substances, once inserted, are made to explode so as to open the container from the inside.

[0007] To try to remedy this danger, active protection devices are already known of substantially able to prevent explosions and fires inside Bancomat, ATMs, safe deposit boxes and the like.

[0008] These active protection apparatuses may act in combination with devices making the banknotes non-utilisable - by means of a marking - and comprise systems capable of diluting hazardous fluids introduced and/or chemically inhibiting their action.

[0009] In particular, to combat the most frequent cases, namely attacks on ATMs perpetrated by introducing detonating gases through the minimal slots present therein for functional requirements, or through small holes made there and then, various apparatuses are used, some mechanical, which hinder the access of the detonating gases to the drawers or compartments containing the banknotes, others which in the presence of any hazardous mixtures detected automatically activate discharges of CO2 or aerosols suitable to inhibit the flames.

[0010] The Italian patent IT-B-1348079, in the name of the same applicant, further describes a system comprising the electrical ignition devices suitable to trigger the combustion of explosive substances before they reach a critical mass.

[0011] However, such systems do not completely resolve the drawbacks of the prior art.

[0012] In this situation, the technical purpose according to the present invention is to devise an anti-burglar device for banknote containers in particular for Bancomat, ATM, acceptors or the like able to substantially overcome the drawbacks mentioned.

[0013] Within the scope of said technical purpose one important objective of the invention to obtain an anti-burglar device for banknote containers in particular for Bancomat, ATM, acceptors or the like which prevents the intrusion of the container by the introduction of explosive substances therein.

[0014] The technical purpose and specified aims are achieved by an anti-burglar device for banknote containers in particular for Bancomat, ATM, acceptors or the like as claimed in the appended Claim 1.

[0015] Preferred embodiments are described in the dependent claims.

[0016] The characteristics and advantages of the invention are clearly evident from the following detailed description of a preferred embodiment thereof, with reference to the accompanying drawings, in which:

> **Fig. 1** shows a diagram of the device according to the invention.

[0017] With reference to said drawings, reference numeral **1** globally denotes the burglar device according to the invention.

[0018] It is positioned in correspondence with a container **2,** such as a safe, in particular a safe for Bancomat, ATMs and the like, with the function of preventing intrusion of the container 2 by insertion of substances or explosive products, such as gases, mixtures, liquids, etc.

[0019] The burglar device 1 comprises, in brief, ignition means **3** suitable to ignite any explosive substances inserted in the container **2,** so that said explosive substances are combusted before they reach a critical mass suitable to cause an explosion, and conveying means **4** suitable to convey the atmosphere contained inside the container 2 to the ignition means 3.

[0020] The term atmosphere is understood to mean the air commonly present and also gases and vapours and/or other substances in suspension in said gases and vapours.

[0021] The conveying means 4 advantageously determine a flow of atmosphere with a flow rate which is not constant but varies over time. In particular, said flow rate shows a periodic trend, more in particular such flow rate varies in a continuous manner, without jumps or steps of a substantial variation, more in particular still, in a sinusoidal manner.

[0022] The conveying means 4 preferably comprise at least one suction device **5,** such as a fan and the like, suitable to create a flow of atmosphere to be conveyed in a forced manner.

[0023] They further preferably include ducts **6**, such as one or more tubes and/or channels in fluidic through connection with the suction device 5. Said ducts 6 comprise one or more openings **6a** positioned inside the container 2 and suitable to withdraw said atmosphere from different

points in appropriate positions of the container 2. Moreover, a filter **7,** preferably a thickness or porous or other filter is appropriately positioned at the openings 6a. The latter is suitable to filter dust, of advantageous size and in relation to the surroundings.

[0024] Structurally the ducts 6 end in a box **9**, isolated from the outside. The suction device 5 and also a pressure switch **8** and/or flow switch and/or flow meter are preferably positioned at or near the box 9, placed in correspondence with the ducts 6 and suitable to verify the possible reduction of flow and/or obstruction thereof. The ignition means 3 suitable to ignite any explosive substances are preferably placed in correspondence with or near the box 9.

[0025] In particular, there are one or more outlet ducts **10** of the atmosphere from the box 9. More in particular, the ignition means 3 are placed in correspondence with the outlet ducts 10.

[0026] The ignition means 3 may be variously achieved, while still maintaining a very simple structure and a minimal cost. They are preferably electric ignition means. Alternatively, the ignition means 3 may consist of piezoelectric lighters, incandescent lighters or even pyrotechnic ignition means. The piezoelectric and electric ignition means act by means of sparks and therefore have a reduced noise, lower than that of pyrotechnic ignition means, which act via small explosions. Incandescent ignition means are instead absolutely silent for prolonged use over time.

[0027] The ignition means 3 comprise an ignition terminal **3a,** suitable to achieve the ignition of the explosive substances, and in particular the electric arc, which closes appropriately on a wall of the outlet duct **10**, and a power supply **3b,** connected to the ignition portion 3a and preferably consisting of an electrical or power transformer or the like.

[0028] The ignition terminals 3a are supported and distanced from the walls of the outlet ducts 10 by support spacers **12** suitable to permit the transit of the atmosphere through the ducts 10.

[0029] The power supply 3b is also preferably positioned in correspondence with the box 9, as well as control electronics **11,** suitable to control the various elements of the device 1 described.

[0030] In the vicinity of the container 2 additional safety means such as alarms **14,** may also be present, suitable to be activated as a result of the ignition of explosive substances by the ignition terminals 3a. These alarms 14 may comprise light sensors, pressure or velocimetric pressure sensors next to the ignition portions 3a and/or other portion.

[0031] Additional flame inhibitor means or other similar devices may also be present. The functioning of the burglar device 1 previously described in functional terms is as follows and defines a new ant-intrusion procedure.

[0032] The container 2, and in particular the Bancomat, ATM or the like, works normally without any alteration.

[0033] During normal operation, appropriately, the conveying means 4 continue to aspirate the atmosphere through the openings 6a and the filters 7 and convey it to the ignition means 3.

[0034] The aspiration is preferably carried out with said sinusoidal or even periodic or even continuous trend without changes in flow over time. The periods of variation may be between 1 s and 10 s.

[0035] The ignition means also function constantly, in particular intermittently, with preferred pulse or even continuous frequency.

[0036] Should an ill-intentioned person introduce explosive substances inside the container 2, such as in particular detonating gases or explosive mixtures, the same would be rapidly aspirated by the conveying means 4. Said suction occurs in fact in any point of the container 2, which normally works at a single pressure and in a single environment. In particular the suction takes place rapidly by means of ducts 6 positioned in a plurality of points of the container 2, and / or even a plurality of openings 6a.

[0037] The explosive substances are thus conveyed to the ignition means 3 which ignite them, causing a flame or a small detonation before the explosive substances reach critical quantities which would result in the rupture of the container 2 by explosion.

[0038] The ignition takes place in particular in the case in which the specific explosive substance reaches its correct stoichiometric ratio with oxygen or with other substances. The non-constant but variable functioning of the atmosphere flow rate causes such correct stoichiometric ratio to be reached in at least one point of the curve which periodically repeats itself.

[0039] In particular, the ignition takes place through the ignition portions and extends along the outlet ducts 10 which are preferably made of flame-resistant material. In this case, in addition, possible alarms for the police or so forth would activate.

[0040] If the openings 6 were clogged or obstructed for any reason, a pressure or flow sensor 8 would detect the change in pressure and would activate an alarm for failure and / or simply to indicate the need for preventive maintenance.

[0041] The invention achieves important advantages.

[0042] In fact, the burglar device 1 simply and quickly defuses explosive substances introduced. In particular said device does not wait for the explosive substances to arrive at the terminals 3a as a result of saturation or filling of the container 2, or by natural, non-forced convection phenomena, but by internal forced convection towards the terminals 3a through the conveying means 4. Said forced convection is necessary since the natural recirculation, or the insertion zones of the explosives, are not always predictable and measurable. In the absence of the conveying means 4 the explosive substances could thus accumulate in sufficient quantities to make the container 2 explode.

[0043] Furthermore, the solution of continuously varying the flow rate of the conveying means, acts so that

each specific explosive substance can automatically find its correct specific stoichiometric ratio, permitting its ignition, during the variations of intensity.

[0044] Furthermore, the burglar device 1 is simple and economical.

[0045] Variations may be made to the invention without departing from the scope of the inventive concept expressed in the independent claims and in the relative technical equivalents. All details may be replaced with equivalent elements and the scope of the invention includes all other materials, shapes and dimensions.

Claims

1. Anti-burglar device (1) for a banknote container (2) comprising:

   - ignition means (3) designed to ignite any explosive substances inserted in the container, so that said explosives are combusted before they reach a critical mass, **characterised in that** it comprises
   - conveying means (4) suitable to convey the atmosphere contained inside said container (2) to said ignition means (3).

2. Anti-burglar device (1) according to claim 1, wherein said conveying means (4) determine a flow of atmosphere with a flow rate, which is not constant but varies over time.

3. Anti-burglar device (1) according to claim 1, wherein said conveying means (4) determine a flow of atmosphere with a flow rate, which shows a continuous trend, not-varying over time.

4. Anti-burglar device (1) according to one or more of the previous claims, wherein said conveying means (4) comprise at least one suction device (5) suitable to create a flow of air for conveying said atmosphere contained inside said container (2) to said ignition means.

5. Anti-burglar device (1) according to claim 5, wherein said conveying means (4) comprise ducts (6) in fluidic through connection with at least one suction device (5) and comprising at least one opening (6a) positioned inside said container (2) and suitable to withdraw atmosphere from said container (2)in different points, at different heights and positions.

6. Anti-burglar device (1) according to claim 5, wherein said conveying means (4) comprise a filter (7), placed in correspondence with at least one of said openings (6a) and suitable to filter said atmosphere contained in the container (2).

7. Anti-burglar device (1) according to one or more of the claims 5-7, wherein said conveying means (4) comprise a pressure switch (8), placed in correspondence with said ducts (6) and suitable to verify an unexpected flow variation or obstruction thereof.

8. Anti-burglar prevention method of a container (2), consisting of igniting via the ignition means (3) any explosive substances inserted in said container, so that said explosive substance are combusted before they reach a critical mass, and **characterised in that** it comprises the conveying of the atmosphere from inside said container (2) to said ignition means (3).

9. Anti-burglar prevention method according to the previous claim, wherein said conveying of the atmosphere takes place by means of a non-constant flow rate which varies over time.

10. Anti-burglar prevention method according to claim 8, wherein said conveying of the atmosphere takes place by means of a flow rate which follows a continuous trend, without variations.

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

1. Anti-burglar prevention method of a container (2), consisting of igniting via the ignition means (3) any explosive substances inserted in said container, so that said explosive substance are combusted before they reach a critical mass, and **characterised in that** it comprises, constantly, the conveying of the atmosphere from inside said container (2) to said ignition means (3).

2. Anti-burglar prevention method according to the previous claim, wherein said conveying of the atmosphere takes place by means of a non-constant flow rate which varies over time.

3. Anti-burglar prevention method according to claim 1 , wherein said conveying of the atmosphere takes place by means of a flow rate which follows a continuous trend, without variations.

4. Anti-burglar prevention method according to one or more of the previous claims, provided by means of a burglar device (1) comprising conveying means (4) suitable to convey the atmosphere contained inside said container (2) to said ignition means (3).

5. Anti-burglar prevention method according to claim 4, wherein said conveying means (4) comprise at least one suction device (5) suitable to create a flow of air for conveying said atmosphere contained inside said container (2) to said ignition means.

6. Anti-burglar prevention method according to claim 5, wherein said conveying means (4) comprise ducts (6) in fluidic through connection with at least one suction device (5) and comprising at least one opening (6a) positioned inside said container (2) and suitable to withdraw atmosphere from said container (2)in different points, at different heights and positions.

7. Anti-burglar prevention method according to claim 6 , wherein said conveying means (4) comprise a filter (7), placed in correspondence with at least one of said openings (6a) and suitable to filter said atmosphere contained in the container (2).

8. Anti-burglar device (1) for a banknote container (2) consisting in a safe for Bancomat, ATMs and the like comprising:

- ignition means (3) designed to ignite any explosive substances, inserted in the container, so that said explosives are combusted before they reach a critical mass,
- conveying means (4) suitable to convey the atmosphere contained inside said container (2) to said ignition means (3),
- **characterised in that** said ignition means (3) and said conveying means (4) are inside said container (2).

9. Anti-burglar device (1) according to the previous claim, wherein said conveying of the atmosphere takes place by means of a non-constant flow rate which varies over time.

10. Anti-burglar device (1) according to claim 8, wherein said conveying of the atmosphere takes place by means of a flow rate which follows a continuous trend, without variations.

11. Anti-burglar device (1) according to one or more of claims 8-10, provided by means of a burglar device (1) comprising conveying means (4) suitable to convey the atmosphere contained inside said container (2) to said ignition means (3).

12. Anti-burglar device (1) according to claim 11, wherein said conveying means (4) comprise at least one suction device (5) suitable to create a flow of air for conveying said atmosphere contained inside said container (2) to said ignition means.

13. Anti-burglar device (1) according to claim 12, wherein said conveying means (4) comprise ducts (6) in fluidic through connection with at least one suction device (5) and comprising at least one opening (6a) positioned inside said container (2) and suitable to withdraw atmosphere from said container (2)in different points, at different heights and positions.

14. Anti-burglar device (1) according to claim 13, wherein said conveying means (4) comprise a filter (7), placed in correspondence with at least one of said openings (6a) and suitable to filter said atmosphere contained in the container (2).

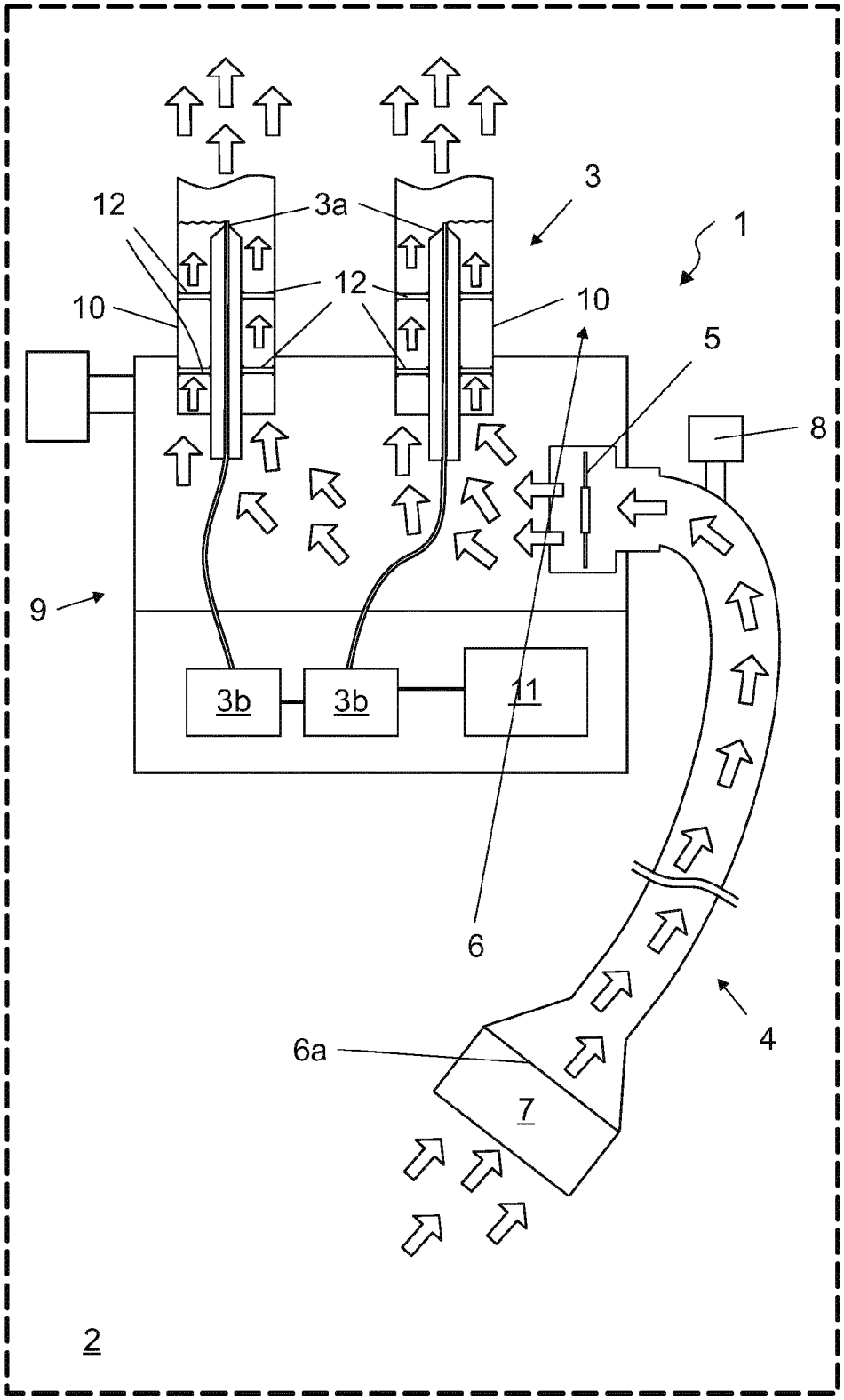


Fig. 1

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 14 17 0026

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 Y	WO 2011/106844 A1 (DIEBOLD PHYSICAL SECURITY PTY LTD [AU]; CARDINAL MIKE [AU]; MUNNECKE J) 9 September 2011 (2011-09-09) * page 5, line 21 - page 6, line 10 * * figure 6 * -----	1-4,6, 8-10 5,7	INV. E05G1/02 G07D11/00
Y A	DE 10 2009 055872 A1 (GRUNDMANN KLAUS [DE]) 1 June 2011 (2011-06-01) * paragraph [0006] - paragraph [0008] * * figures 1,3 * -----	5,7 1-4,6, 8-10	
A	DE 20 2014 101209 U1 (BANQTEC GMBH [DE]) 28 March 2014 (2014-03-28) * paragraph [0010] - paragraph [0012] * * paragraph [0015] - paragraph [0017] * * figure 1 * -----	1-10	
A	EP 1 865 141 A2 (GARCIA SALZ JOSE LUIS [ES]) 12 December 2007 (2007-12-12) * paragraph [0011] * * paragraph [0013] - paragraph [0014] * -----	1-10	TECHNICAL FIELDS SEARCHED (IPC)
A	DE 20 2006 004439 U1 (TUTT LARS [DE]) 11 May 2006 (2006-05-11) * the whole document * -----	1-10	G07F E05G G07D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	2 October 2014	Bauer, Sebastian

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 17 0026

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

02-10-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011106844 A1	09-09-2011	AU 2011223506 A1	27-09-2012
		CA 2792374 A1	09-09-2011
		CN 102812196 A	05-12-2012
		EP 2542747 A1	09-01-2013
		US 2013048715 A1	28-02-2013
		WO 2011106844 A1	09-09-2011
DE 102009055872 A1	01-06-2011	NONE	
DE 202014101209 U1	28-03-2014	NONE	
EP 1865141 A2	12-12-2007	EP 1865141 A2	12-12-2007
		ES 2310093 A1	16-12-2008
DE 202006004439 U1	11-05-2006	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

- IT 1348079 B **[0010]**