(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
9 August 2012 (09.08.2012)

WIPO | PCT

(10) International Publication Number
WO 2012/104885 A1

(51) International Patent Classification:
E03F 5/04 (2006.01)

(21) International Application Number:
PCT/IT2012/000034

(22) International Filing Date:
1 February 2012 (01.02.2012)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
RM2011A000047 3 February 2011 (03.02.2011) IT

(71) Applicants *(for all designated States except US)*: **ANDREOLI, Fabrizio** [IT/IT]; Contrada Collatuccio, 6, I-65014 Loreto Aprutino (IT). **ANDREOLI, Mattia** [IT/IT]; Contrada Collatuccio, 6, I-65014 Loreto Aprutino (IT). **ANDREOLI, Paolo** [IT/IT]; Contrada Collatuccio, 6, I-65014 Loreto Aprutino (IT).

(72) Inventor; and
(71) Applicant : **ANDREOLI, Mauro** [IT/IT]; Contrada Collatuccio, 6, I-65014 Loreto Aprutino (IT).

(74) Agent: **MARI, Marco, Giovanni**; c/o Ing. Mari & C. Srl, Via Leonina, 26, I-00184 Roma (IT).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(54) Title: FLOOR DRAIN FOR SYSTEMS FOR EVACUATING PRECIPITATION WATER FROM WATERTIGHT COVERINGS

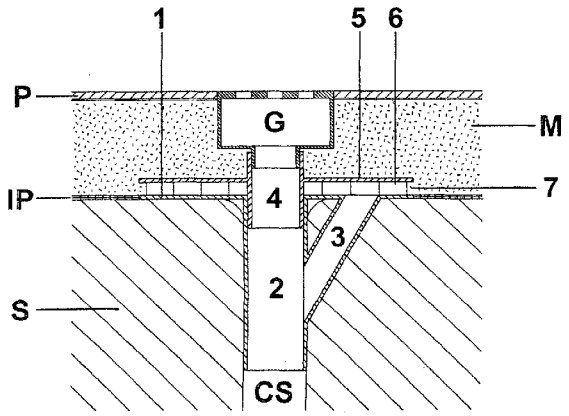


FIG. 3

(57) Abstract: The present invention concerns a floor drain for systems for evacuating water from waterproofing coverings precipitation. Said exhaust outlet mainly consists of: - a clamping plate (1) arranged for allowing interposition of said discharge outlet between drainage pipes (G) and clearing pipes (CS) of said system; - a first pipe 2 and a second pipe 3, reciprocally connected in Y-shape and integral with said clamping plate 1; - a tubular joint (4) arranged for connecting the single drainage grids (G) with pipe (2) of the exhaust outlet corresponding to said grids, and consequently with the clearing pipe (CS) connected to the same; - a flat structure (5) arranged for supporting said tubular joint (4); - a double order of dot- like or lamellar spacers (6) arranged for allowing the rest of said flat structure (5) onto said clamping plate (1) determining the realization of a hollow gap (7) between said flat structure (5) and said clamping plate (1).

WO 2012/104885 A1

FLOOR DRAIN FOR SYSTEMS FOR EVACUATING PRECIPITATION WATER FROM WATERTIGHT COVERINGS

* * * * *

The present invention concerns the field of the systems for evacuating meteoric water usually associated to terraces, terraced roofs and similar waterproofing pavement surfaces.

More in detail, it concerns an exhaust outlet, that may be integrated with said systems, arranged for allowing the normal discharge of flowing rainwater from the pavements of above mentioned waterproofing coverings and, at the same time, the drainage of any infiltrated rainwater.

It is well known that, for preventing the stagnation of rainwater on the waterproofing pavements of terraces, terraced roofs and similar places, usually a special system is associated thereto for the evacuating meteoric water, comprising a plurality of exhaust outlets communicating with a network of clearing outlets in turn connected to the gutters or to the rainwater discharges of the building.

In is furthermore known that, besides from the efficiency of said systems, the apparition of slits or capillary cracks on the surface of the pavements of above mentioned places, due to the action of atmospheric agents and of temperature change on the same, favours the leaking of infiltrating rainwater through said pavements, and through the relative resting block, and consequently the stagnation of said rainwater on the waterproofing sheathings for the protection of the floors underneath.

It is also known that said infiltrations carry along residuals of the materials they pass through thus causing, on the surface of said waterproofing sheathings, the formation of cement limestone deposits which, with their progressive volume increase, are able to

produce a proportional rising of the block above and, consequently, to determine the damaging of the pavement placed thereon.

If said deposits are formed near the drainage outlets of the evacuation system of rainwater associated to above mentioned places, the rising of the block may cause, in addition to the damage to the pavements, the detachment of said drainage outlets from the corresponding clearing pipes as well, and thus determine the malfunctioning of that part of system connected thereto.

The detachment of above mentioned elements furthermore allows said infiltrated rainwater to directly spill into the clearing pipes of the system, causing the progressive occlusion thereof due to the cement limestone deposited on the walls of the same, and consequently the functional block of the part of the system related thereto.

It is the aim of the present invention to overcome above mentioned problems.

It is the aim of the present invention to realize a discharge outlet placed between the drainage grids and the clearing pipes of a system for evacuating meteoric water, of the kind usually associated to terraces, terraced roofs and similar waterproofing coverings, which may allow the discharge of flowing rainwater from the pavements of said surfaces and, at the same time, the drainage of any infiltrated rainwater stagnating on the waterproofing sheathings for the protection of the floors of said coverings.

The aim set forth is reached by an exhaust outlet for systems for evacuating meteoric water from waterproofing coverings, characterized in that it comprises:

- a clamping plate arranged for allowing interposition of said exhaust outlet between drainage grids and clearing pipes of a system for evacuating meteoric water, of the kind usually

associated to terraces, terraced roofs and similar waterproofing coverings;

- a first pipe and a second pipe reciprocally connected in Y-shape and integral with said clamping plate, wherein said first pipe allows the discharge of flowing rainwater from the pavements of above mentioned coverings, and said second pipe allows the contemporary drainage of any infiltrated rainwater stagnating on the waterproofing sheathings for the protection of the floors of said coverings.

The present invention has the following advantages:

- it prevents the stagnation of infiltrated rainwater on the waterproofing sheathings for the protection of the floors of terraces, terraced roofs and similar waterproofing coverings, and consequently the formation of cement limestone deposits on the surface of said coverings;
- it avoids the damaging of the pavements of above mentioned coverings due to the rising of the relative resting block caused by the progressive volume increase of said limestone deposits;
- it avoids the damaging of the system for evacuating meteoric water associated to above mentioned coverings, due to the detachment of the drainage outlets from the corresponding clearing pipes, also due to the progressive volume increase of said limestone deposits;
- it avoids the occlusion of the clearing pipes of the system for evacuating meteoric water associated to above mentioned coverings, due to the formation of said cement limestone deposits onto the inner walls of said pipes;

- it reduces the costs of maintenance and/or repair operations of the pavements of above mentioned coverings and of the system for evacuating meteoric water associated to the same.

The advantages of the invention shall appear more clearly from the following description of preferred embodiments, made by way of an indicative and non-limiting example, with reference to the figures.

Figures 1 and 2 respectively show, in a complete axonometric view and in an exploded view, the structural shape of an exhaust outlet for systems for evacuating meteoric water according to the present invention.

Figure 3 shows a vertical section of an example of installation of the same.

Figure 4 shows a complete axonometric view of the structural shape of a possible shape variant of the exhaust outlet according to the preceding figures.

Figure 5 shows, in a plane vertical section, an example of installation according to said variant.

With reference to the details shown in figures 1, 2, 3, said exhaust outlet mainly consists of:

- a clamping plate 1 that may be applied by welding or gluing to the surface of the floors S of terraces, terraced roofs and similar places, arranged for allowing the interposition of said discharge outlet between the drainage pipes G and the clearing pipes CS of a system for evacuating meteoric water associated to above mentioned coverings;
- a first pipe 2 and a second pipe 3, reciprocally connected in Y-shape and integral with said clamping plate 1, wherein said first pipe 2 determines the discharge of flowing rainwater from the pavement P of above mentioned coverings, and said second pipe 3 determines the contemporary drainage of the

infiltrated rainwater stagnating on waterproofing sheathings IP for the protection of said floors S, by leading said water towards the clearing pipes CS of said system;

- a tubular joint 4 arranged for connecting the single drainage grids G, placed on the pavement P and passing through the resting block M underneath, with the first pipe 2 of the exhaust outlet corresponding to said grids, and consequently with the clearing pipe CS connected to the same;
- a flat structure 5 arranged for supporting said tubular joint 4;
- a double order of dot-like or lamellar spacers 6, placed in discontinuous order along the lower border of the flat structure 5, arranged for allowing the resting of the same onto clamping plate 1 so as to determine the formation - between said flat structure 5 and said clamping plate 1 – of a special hollow gap 7 arranged for allowing the discharge of any infiltrated rainwater stagnating on the waterproofing sheathings IP of the floors S, towards the second pipe 3 of the exhaust outlet.

According to the present invention, the clamping plate 1 of each single exhaust outlet is secured by welding or gluing to the surface of the floors S of terraces, terraced roofs and similar coverings, and connected with waterproofing sheathings IP for the protection of said coverings, so as to determine the formation of a continuous structure which, without interruption, prevents the passage of any infiltrated rainwater towards said floors S and, at the same time, allows the stable positioning of the lower end of the first pipe 2 of the single exhaust outlets inside clearing pipes CS of the system for evacuating meteoric water associated to above mentioned coverings.

Furthermore, the first pipe 2 of each single exhaust outlet is connected by means of a special tubular joint 4, to one of the drainage grids G on the pavement P of above mentioned coverings,

so as to determine the connection thereof with the clearing pipe CS connected thereto.

The tubular joint 4 is supported by a flat structure 5 provided with a double order of dot-like or lamellar spacers 6, arranged in discontinuous order along the lower border of said structure, arranged for allowing the rest thereof onto said clamping plate 1, determining at the same time the formation of a special hollow gap 7 between said flat structure 5 and said clamping plate 1.

As a consequence, when it rains, the flowing rainwater on pavement P are collected, as usual, by drainage grids G and, by means of tubular joints 4, they are first led into the first pipe 2 of the single outlets, and then spilled into clearing pipes CS, which convey them towards the gutters or the rainwater discharges of the building.

Instead, the infiltrated rainwater that might stagnate onto the waterproofing sheathings IP of said floors S, is led towards the exhaust outlets by means of appropriate inclinations given to the floors in the construction phase, so as to determine the flowing thereof, through suitable spacers 6, into said hollow gaps 7 contained between the clamping plates 1 and the flat surfaces 5 above.

Said water is then collected by the second pipe 3 of the single outlets, open on the relative clamping plate 1, and by means of the first pipe 2, connected thereto in Y-shape, it is spilled into the clearing pipes CS for being conveyed to the gutters or the rainwater discharges of the building.

Figures 4 and 5 show a shape variant of said outlets having the purpose of fitting them to the different kinds of existing systems for evacuating meteoric water.

Said embodiment comprises a clamping plate 8, having an angular shape, carrying the first pipe 2 and the second pipe 3, which may be applied by welding or gluing to the surface of floors S and, at the

same time, to .the lower part of the masonry nearby the same; furthermore, it may be connected to waterproofing sheathings IP for the protection of said floors.

Said clamping plate 8 allows the installation of said exhaust outlets in horizontal position so that, due to an adequate inclination given in the construction phase to floors S and to the pavement P above, the first pipe 2 may allow the discharge of flowing rainwater – operating like a common overflow vent – from said pavements P, while second pipe 3 may allow the drainage of infiltrated rainwater transversally flowing through block M.

The collected rainwater is spilled in clearing pipes CS, which in this case are connected to the second pipe 3 of the single outlets, for finally conveying the rainwater towards the gutters or the rainwater discharge of the building.

Above described exhaust outlets are made out of synthetic materials like bituminous membranes, rubber, plastic PVC, stiff neoprene and other materials.

* * * * *

CLAIMS

1. An exhaust outlet for systems for evacuating meteoric water from waterproofing coverings, characterized in that it comprises:
   - a clamping plate (1) arranged for allowing interposition of said exhaust outlet between drainage grids (G) and clearing pipes (CS) of a system for evacuating meteoric water, of the kind usually associated to terraces, terraced roofs and similar waterproofing coverings;
   - a first pipe (2) and a second pipe (3) reciprocally connected in Y-shape and integral with said clamping plate (1), wherein said first pipe (2) allows the discharge of flowing rainwater from the pavements (P) of above mentioned coverings, and said second pipe (3) allows the contemporary drainage of any infiltrated rainwater stagnating on the waterproofing sheathings (IP) for the protection of the floors (S) of said coverings.
2. An exhaust outlet according to claim 1, characterized in that said first pipe (2) is directly connected to one of the clearing pipes (CS).
3. An exhaust outlet according to claim 1, characterized in that said first pipe (2) is connected to one of the drainage grids (G) by means of a tubular joint (4).
4. An exhaust outlet according to claim 3, characterized in that said tubular joint (4) is integral with a flat supporting structure (5).
5. An exhaust outlet according to claim 4, characterized in that said flat supporting structure (5) comprises spacers (6) arranged in discontinuous order along a lower face of the same.
6. An exhaust outlet according to claim 5, characterized in that said spacers (6) are if dot-like or lamellar type and allow the rest of said flat structure (5) onto said clamping plate (1), thus

determining the realization of a hollow gap (7) between said flat structure (5) and said clamping plate (1).

7. An exhaust outlet according to claim 1, characterized in that it comprises a clamping plate (8) having an angular shape.

* * * * *

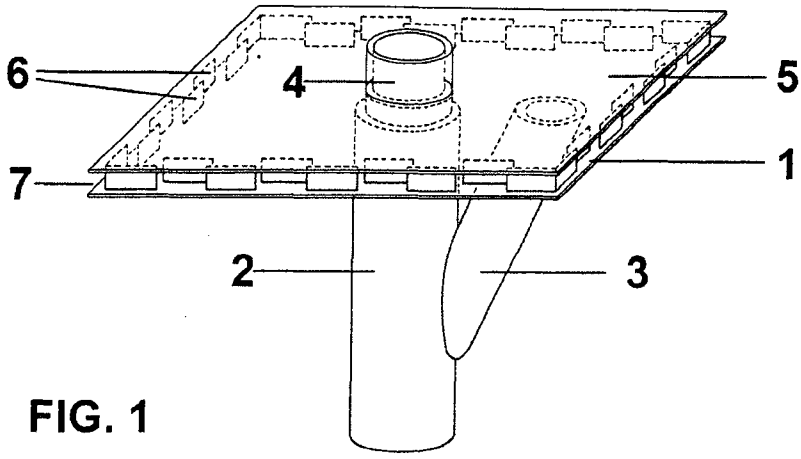


FIG. 1

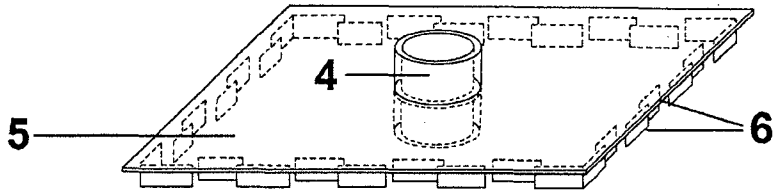
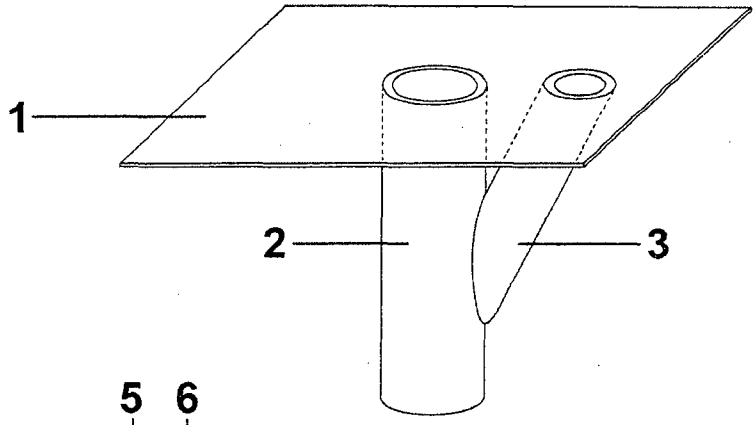


FIG. 2



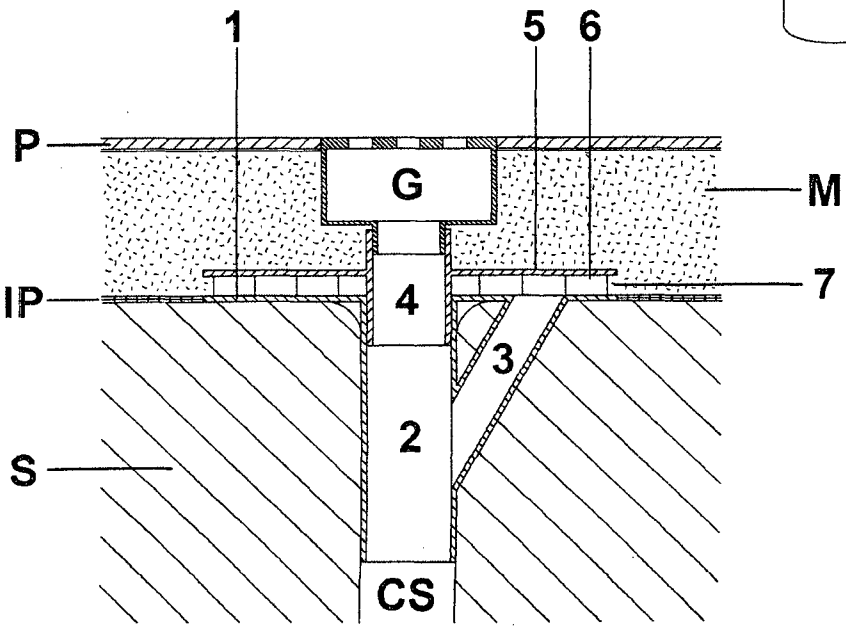


FIG. 3

FIG. 4

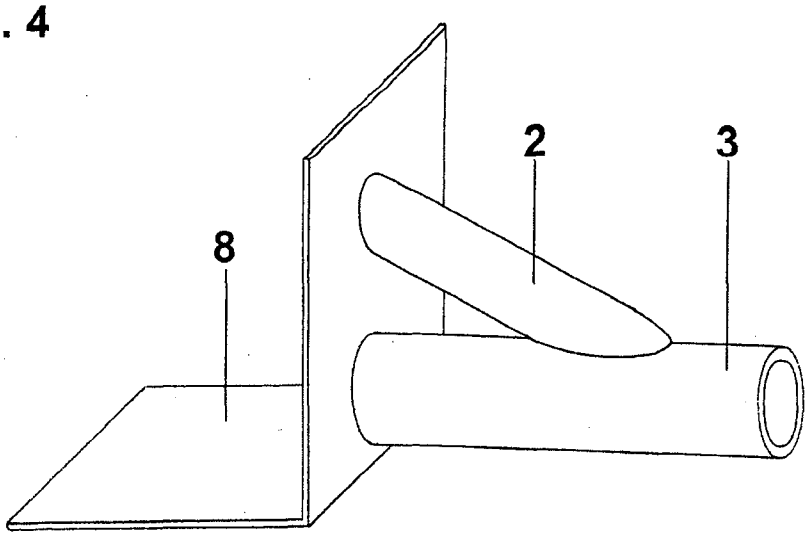
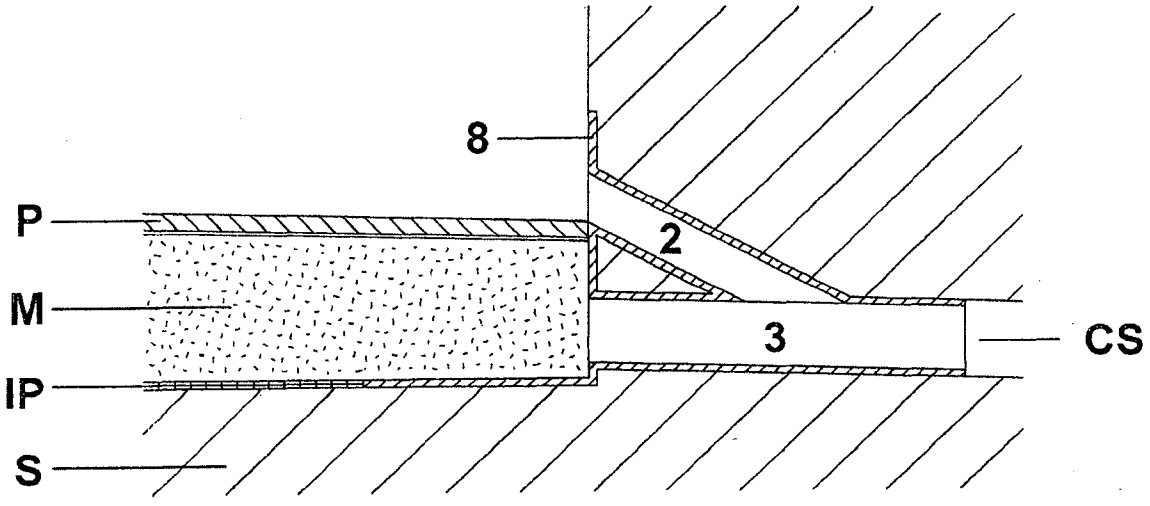


FIG. 5



INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2012/000034

A. CLASSIFICATION OF SUBJECT MATTER
INV. E03F5/04
ADD.

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)
E03F E04D

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)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	GB 2 034 784 A (SKIBILD J B) 11 June 1980 (1980-06-11) the whole document	1-4,7 3-6
Y	US 2 127 167 A (FRATERS WILLIAM M) 16 August 1938 (1938-08-16) the whole document	3,4
Y	US 5 022 430 A (DEGOOYER LONNIE C [US]) 11 June 1991 (1991-06-11) the whole document	5,6
A	GB 1 153 611 A (DUNLOP CO LTD [GB]) 29 May 1969 (1969-05-29) the whole document	1
A	US 2010/319281 A1 (EGAN MICHAEL J [US]) 23 December 2010 (2010-12-23) the whole document	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 July 2012	26/07/2012

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Horst, Werner

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IT2012/000034

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2034784 A	11-06-1980	DE 2942687 A1	08-05-1980
		DK 443679 A	26-04-1980
		GB 2034784 A	11-06-1980
		SE 7908856 A	26-04-1980
US 2127167 A	16-08-1938	NONE	
US 5022430 A	11-06-1991	NONE	
GB 1153611 A	29-05-1969	DE 1658184 A1	05-03-1970
		ES 337573 A1	01-03-1968
		FR 1514507 A	23-02-1968
		GB 1153611 A	29-05-1969
US 2010319281 A1	23-12-2010	NONE	