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(54) **SYSTEM FOR CLEARING SNOW AND ICE FROM PAVEMENTS AND SIMILAR**

(57) A system for clearing snow, ice, or frost from pavement and similar surfaces. The system is located underground and combines at least one main pipe of gaseous steam flow network including multiple independent pipe branches with valve devices, spaced apart from one another, all of which converge at least one secondary pipe including a series of sprinklers having snow or ice detection sensors, as well as an automatic trigger device for triggering the sprinklers, so as to melt the snow or ice formation.

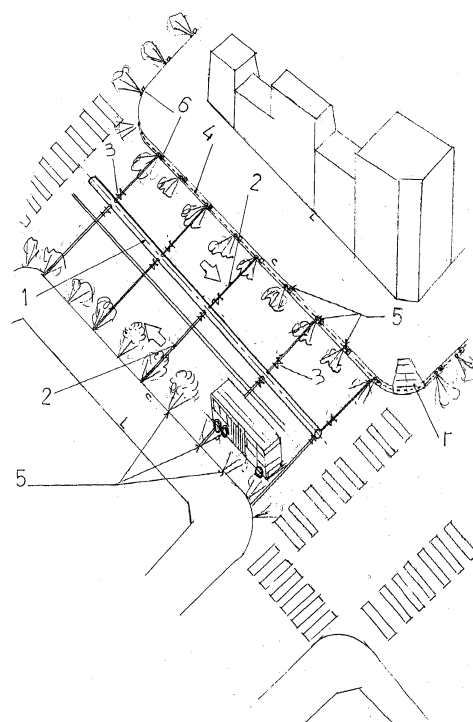


FIG. 1

Description

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application is a *national stage* entry of PCT/EC2012/000019 filed March 23, 2012, under the International Convention and claiming priority over Argentinean Patent Application No. 20110101121 filed March 01, 2011.

TECHNICAL FIELD OF THE INVENTION

[0002] This invention refers to a system for removing snow, ice, or frost from pavement and similar surfaces. The system is specifically conceived and accomplished to achieve, in a fast and efficient way, the dissipation of snow or ice accumulated over pavements, lanes, highways, roads, and motorways.

BACKGROUND OF THE INVENTION

[0003] Generally, and as it is known, climate change is getting more dynamic and one of the arising problems is the presence of snow, ice, or frost in different areas or places, particularly in urban centers.

[0004] The approached problem has led to thinking about a solution, by the development of a system, for removing snow, ice, or frost from pavement and similar surfaces for the purpose of significantly increasing the safety for people and reducing weather-related traffic situations.

[0005] It is known in the art the use of a system that throws salt by using a truck to remove snow and frost from the pavement. Unfortunately, this system not only implies the use of a vehicle to actually throw the salt, but it also requires at least a driver and a workman, therefore, an investment in labor is required.

[0006] Adding to these inconveniences, it has to be added the fact that the pavement deteriorates enormously with the salt, raising the maintenance cost of the roads, and also affecting the vehicles.

[0007] Another known technique of heating systems is by using infrared rays for the reduction or annulment of the frost on highways to warm up the pavement to defrost and melt the snow (See for example, ES 2 072 216 B1; ES 2 116 175 B1).

[0008] ES 2237257B1 discloses a snowplow truck including a road dryer that uses a scoop that takes off the snow in the front zone of the cabin. The reference also discloses an assembly of tubes, with an electric engine in its interior, that takes high-pressure air through an exit nozzle that faces the floor.

[0009] Another technique is the use of a device to compact and remove snow as is shown on US 4,454,667 A.

SUMMARY OF THE INVENTION

[0010] Leading out of the present state and the previ-

ous art of the technique mentioned above, the main objective of this invention is based on a system for removing snow, ice, or frost from pavement and similar surfaces, providing a solution to the multiple inconveniences generated in the different cities of the world by the accumulation of snow or frost in the winter season. This leads to millions of losses of money, causing school and work closures, and also causing traffic accidents that result mainly with terrible casualties.

[0011] The goal of the invention is to improve the lifestyle of citizens through a low cost, by using resources that are already in use today.

[0012] The removal of snow, ice, or frost is done by melting, using the underground vapor pipes already being used by cities, such as New York, Berlin, and London.

[0013] In addition, the present invention may remove stagnation from bridges, tunnels, railroads, airports, highways, covered stadiums, parking lots, squares, and parks.

[0014] The system, according to the present invention, works with the underground vapor network system that the city already has. But, as another embodiment, the present invention may work with the boiler networks of houses, buildings, stores, and industries that are already in use for central heating or electricity. It can be turned into power to serve machines.

[0015] The way in which this and other objectives and advantages of the invention are reached will be explained in the description that follows. This will be an example, with the preferred accomplishments of the invention, and also with the pictures that follows, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

Fig. 1, shows a schematic view of the removal system according to an embodiment of the present invention.

Fig. 2, shows a schematic view of the system according to another embodiment of the present invention showing the cleaning and dewatering of a ramp for disabled people, which is really important to assure the mobility of all citizens and to avoid trials against the Government.

Fig. 3, shows a schematic view of the system according to another embodiment of the present invention showing a hose to which, optionally, an equipment could be plugged in to raise the vapor pressure, and gain time and distance of work.

Fig. 4, shows a schematic view of the system according to another embodiment of the present invention showing other ways to allocate the vapor for the melting of snow or frost by using double function grills, "melting and drainage", and also by placing radiation panels.

DETAILED DESCRIPTION OF THE INVENTION

[0017] In all figures, the same reference numbers indicate similar or corresponding elements, which are:

1. Main piping network of circulation of vapor gas.
2. Independent piping branches.
3. Valves.
4. Secondary piping.
5. Sprinklers.
6. Sensors.
7. Cabinet with regulation means and vapor gas control.
8. Conduits.
9. Metal sheets.
10. Flexible conduit (hose).
11. Movable equipment.
- C= Curb.
- L= Municipal Line.
- r = Anti-skid ramp.
- n= Accumulated snow or ice.
- A= Traffic access.

- 5 **3.** A system to remove the snow or ice from the pavement or similar surfaces, according to claim 2, this system is **characterized by** having at least one cabinet to which an autonomous equipment can be attached to dose the steam flux, to remove or melt the snow or ice.

[0018] The system 1 works with the presence of snow or ice, in which the sensors 6 catch their presence and the sprinklers 5 are automatically activated, releasing a vapor gas fluid against the pavement, melting or removing the ice or snow formation.

[0019] The sizing and design of the system of the present invention and the mobile equipment may be changeable, depending on the geographical situation and on the cost-benefit-efficiency analysis that each particular case requires.

[0020] According to all the information exposed and illustrated above, it is easy to understand the practicality and advantages that this system for removing snow, ice, or frost from pavement and similar surfaces offers. The attached list of claims deals with the scope of the invention.

[0021] Having described and determined the nature of the invention, and the way in which it can be put into practice in its prime idea, it is declared an invention and an exclusive property, as follows:

Claims

1. A system to remove ice or snow from the pavement and similar surfaces, **characterized by** handling underground, the combination of at least one main network of independent pipes, with valves, having some distance from each other, with all of them merging to at least one minor plumbing which includes a series of sprinklers, that contain sensors that detect the presence of such snow or frost, also they have an automatic trigger, to melt the snow or frost.

2. A system to remove the snow or the ice from the

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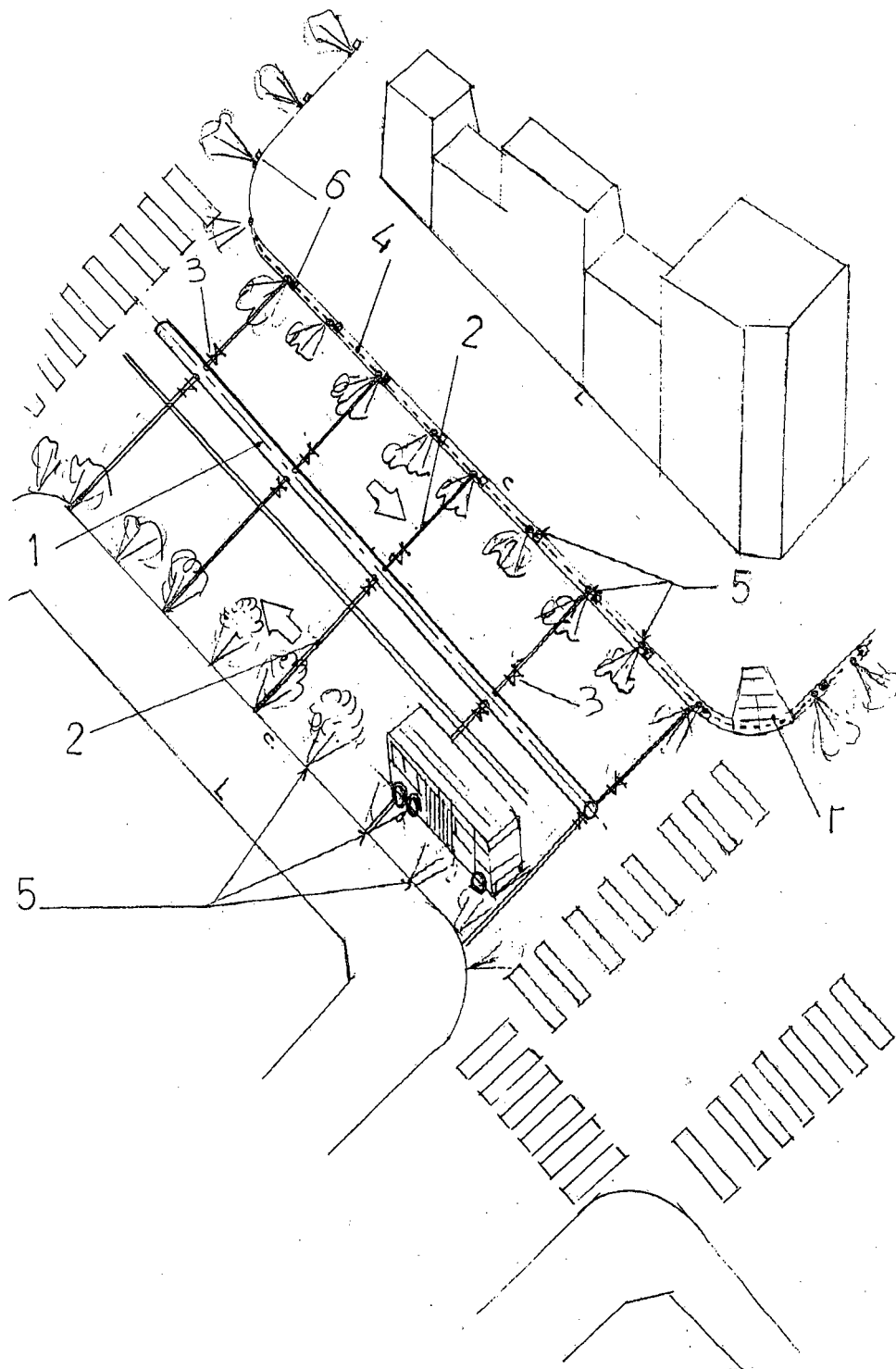


FIG. 1

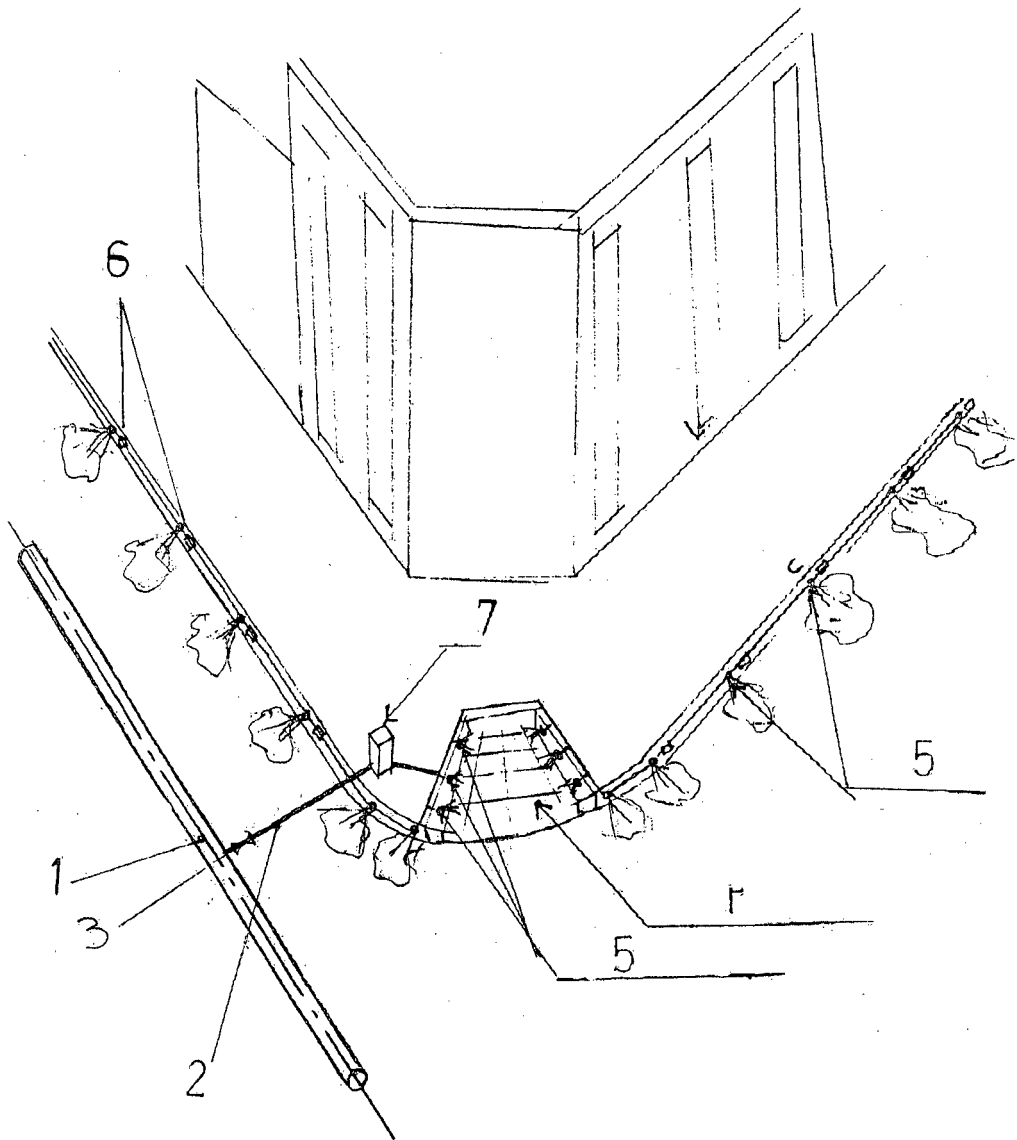


FIG. 2

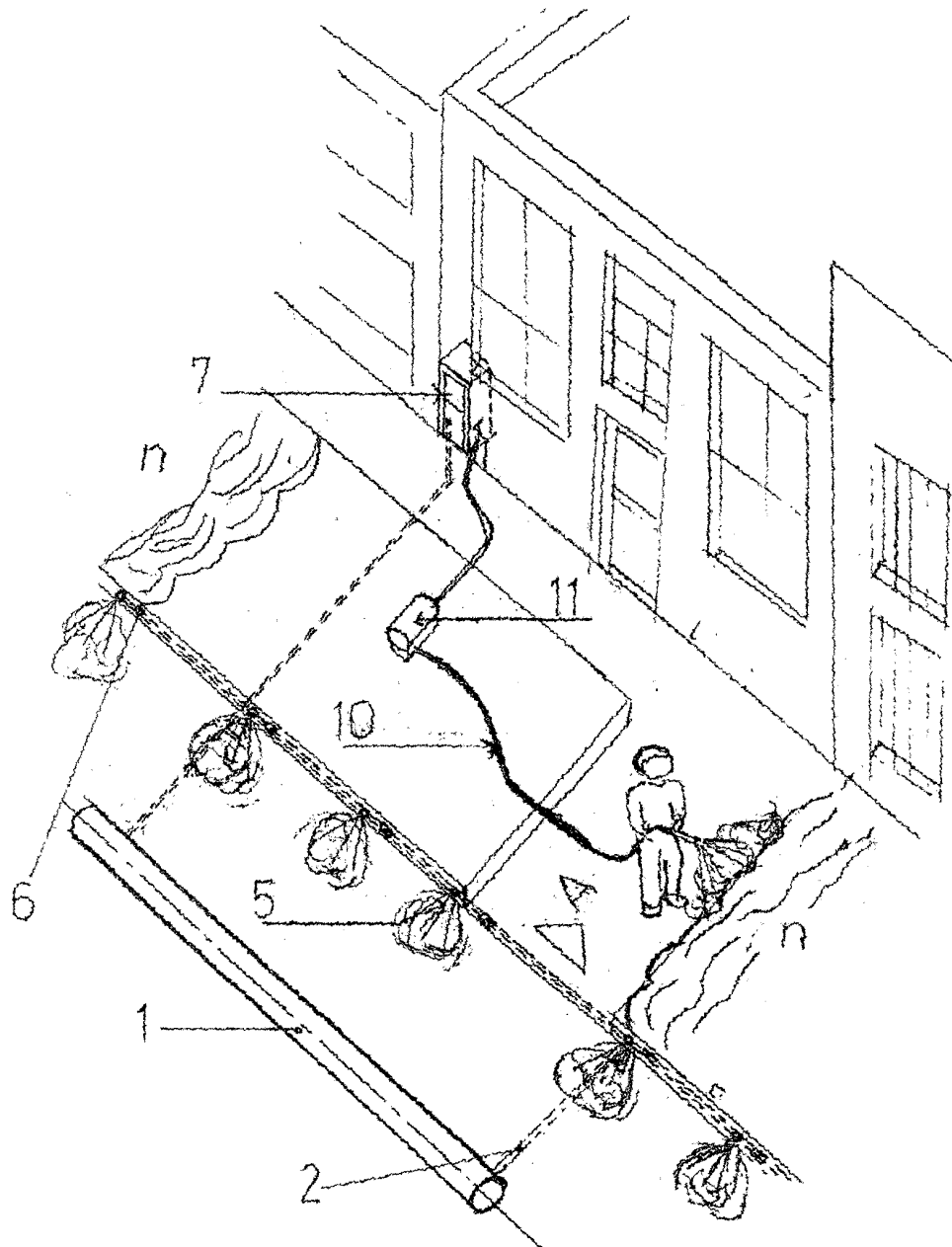


FIG. 3

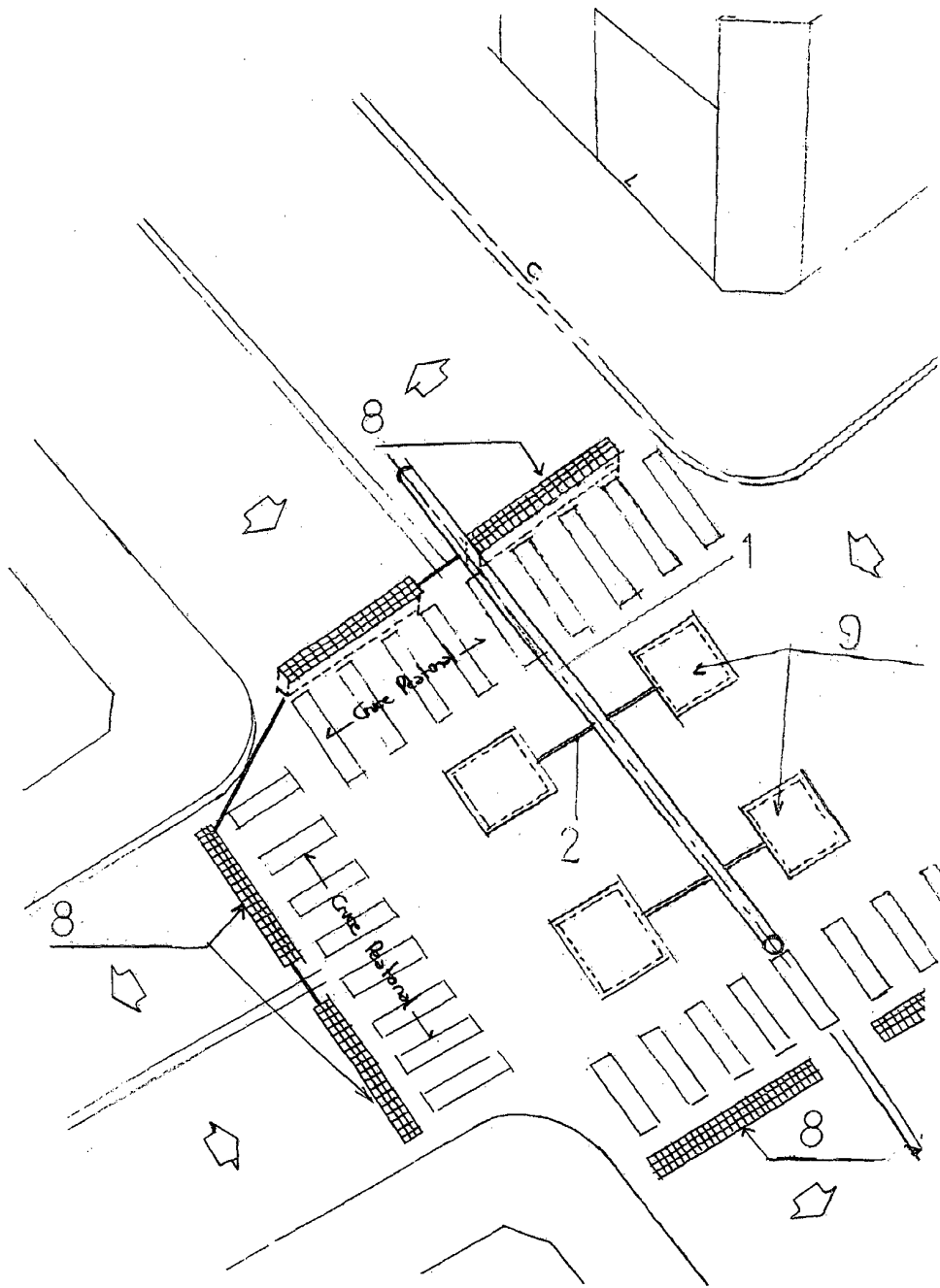


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EC2012/000019

A. CLASSIFICATION OF SUBJECT MATTER

E01C11/26 (2006.01)*E01H5/10* (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)

E01C, E01H

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB 974999 A (ALBERT EDWARD RICHARDS) 11/11/1964, page 1, lines 37 - 58; page 2, line 96 - page 3, line 19; figures.	1-3
Y	US 4693301 A (BAEHRLE FRIEDRICH ET AL.) 15/09/1987, page 2, line 56 - page 4, line 38; figures.	1-3
A	US 2617597 A (RAMON BONILLA) 11/11/1952, column 2, line 35 - column 5, line 27; figures.	1-3
A	US 2634659 A (ASSEN JORDANOFF) 14/04/1953, column 2, line 32 - column 3, line 29; figures.	1
A	GB 812654 A (FRIEDRICH NALLINGER) 29/04/1959, the whole document.	1

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

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance.	
"E" earlier document 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)	"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
"O" document referring to an oral disclosure use, exhibition, or other means.	"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 documents , such combination being obvious to a person skilled in the art
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search
09/08/2012Date of mailing of the international search report
(30/08/2012)

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/EC2012/000019

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 3031858 A1 (BECKER EMIL & ADOLF GMBH CO) 01/04/1982, page 6, line 7 - page 9, line 16; figures.	1

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/EC2012/000019

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
US4693301 A	15.09.1987	BE905398 A FR2587049 AB DE3532542 AC NL8602134 A JP62072802 A	31.12.1986 13.03.1987 19.03.1987 01.04.1987 03.04.1987
----- DE3031858 A	----- 01.04.1982	----- NONE	-----
----- GB974999 A	----- 11.11.1964	----- NONE	-----
----- GB812654 A	----- 29.04.1959	----- NONE	-----
----- US2617597 A	----- 11.11.1952	----- NONE	-----
----- US2634659 A	----- 14.04.1953	----- NONE	-----
----- US2465587 A	----- 29.03.1949	----- NONE	-----
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Form PCT/ISA/210 (patent family annex) (July 2009)

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

- EC 2012000019 W **[0001]**
- WO 20110101121 AR **[0001]**
- ES 2072216 B1 **[0007]**
- ES 2116175 B1 **[0007]**
- ES 2237257 B1 **[0008]**
- US 4454667 A **[0009]**