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(71) Applicant: **Electrolux Home Products Corporation N.V.**
1930 Zaventem (BE)

(72) Inventor: **Paillat, Laurent**
08090 Aiglemont (FR)

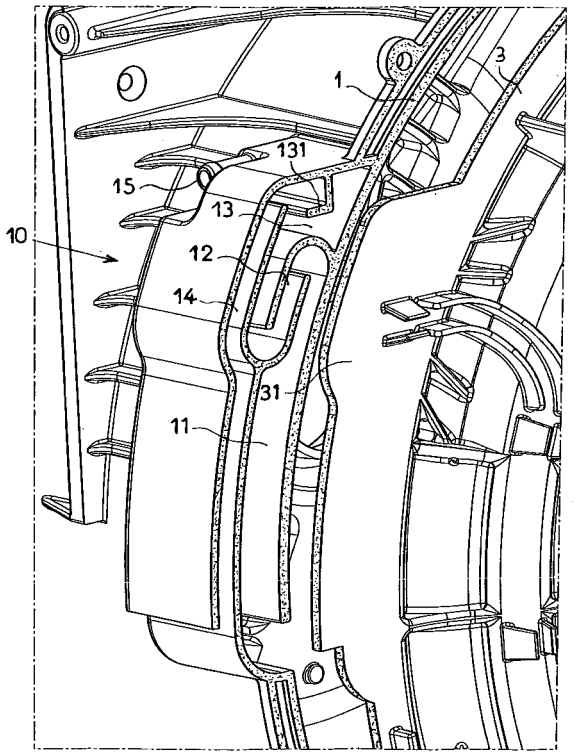
(74) Representative: **Gérardin, Robert Jean René**
PROT'INNOV INTERNATIONAL SA
3A avenue Georges Clemenceau
BP 2764
51066 Reims Cedex (FR)

Remarks:
Amended claims in accordance with Rule 86 (2) EPC.

(54) Integrated tub overflow system for top-loading washing machine

(57) This integrated overflow system is constituted of a labyrinth (10) incorporated in the machine tub body comprising an ascending baffle (11) that begins inside the tub body (1) and communicate with it, opening into a meander that forms a siphon (12) which opens into a little room (13) that includes an L-shaped deflector in its upper part, which communicates, with a descending baffle (14) next to the ascending baffle (11) opening into the open air and with a nozzle (15) connected directly to the room (13) and coming out behind the room L-shaped deflector (131).

FIG.2



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Description

[0001] The invention refers to an integrated tub overflow system for a top-loading rotating-drum washing machine.

[0002] On this type of machine, it was deemed essential to equip the tub with an integrated overflow system designed to avoid any overflow of the tub inside the machine, which would be likely to cause short-circuits and damage to the machine electrical equipment in case the machine malfunctions during use.

[0003] Currently, the integrated overflow system consists of a flexible pipe connected to the tub, directing excess water to the base of the machine away from the electrical equipment.

[0004] However, during machine operation, and especially during spin-drying, the flexible pipe accommodating any overflow is subjected to vibrations that pound it against the fixed parts of the machine, which over time results in the progressive disconnection of the pipe from the machine tub overflow nozzle, which causes leaks around the connection, thereby generating and maintaining humidity that is initially undetectable by the user since in this case the liquid flows by trickling along the tub, behind the machine body. The same problem arises with potential overflows of foam, which break itself for a large part of the integrated overflow system designed to evacuate liquid.

[0005] The purpose of the present invention is to provide a solution for these disadvantages. The invention, as it is characterised in the claims, resolves the problem by creating an integrated overflow system for a top-loading washing machine, whereby, on the one hand, all evacuation piping, be it rigid or flexible, is eliminated and, on the other hand, the said system be fully integrated in the machine tub during its manufacturing of the tub, without use of additional parts.

[0006] The advantages procured by this invention consist primarily in that there is no risk of a leak around the overflow connection or any risk of foam overflow or vapour production. Mounting the tub in its frame is facilitated by the lack of specific parts to attach and connect. The flow resulting from a potential overflow is channelled towards an area removed as far as possible from the electrical equipment.

[0007] Other characteristics and advantages will appear in the following description of a method of making the system according to the invention, given as a non-limiting example with regard to the appended drawings where:

- figure 1 shows a partial plan view of the tub's left flange joint, around the system,
- figure 2 shows a partially exploded perspective view of the tub, around the system,
- figure 3 shows a side perspective view of the tub before its left flange is mounted.

[0008] The figures represent an integrated overflow system for a top-loading washing machine according to the invention, whose tub includes, around its junction plane with the corresponding flange **3,** a system forming a labyrinth **10** open on the side of the junction plane with the flange **3,** including an ascending hollow baffle **11** that starts inside the tub at a predetermined spot and opens into a meander forming a siphon **12,** which opens into a room **13** with an L-shaped deflector **131** by communicating on the one hand with a descending baffle **14** next to the ascending baffle **11** and coming into the open air around the base of this last baffle and, on the other hand, with a nozzle **15** connected directly to the room **13** and coming out behind the L-shaped deflector **131.**

[0009] In examining the figures in more detail, one notices first of all, by simultaneously and comparatively examining figures 1 and 2, that the labyrinth **10** for the flow of excess water is made as a hollow in the junction plane of the tub body **1** with the corresponding flange **3,** which includes the labyrinth **10** lid **31** that in this way, during assembly of the left flange **3** with the machine tub body **1,** definitively materialises the baffles **11** and **14** of the labyrinth **10** thereby constituting the overflow according to the invention. The tub body **1** is assembled with its flanges **3** according to the conventional technique, without any other constraint than to align the system with its lid **31,** as shown in figure 2.

[0010] One also notes on the same figures that the siphon **12,** provided it is filled with water, resists the passage of foam and vapour. Regarding condensation water than can appear in the upper part of the system, it flows normally inside the drum through the ascending baffle **11** of the labyrinth **10** by overflowing the siphon **12** as soon as the siphon is full.

[0011] In referring to figure 2, one notes that the nozzle **15** coming out inside and behind the L-shaped deflector **131** can, given the shape of the said deflector **131,** prime the siphon **12** without any risk of projection at the entry to the descending baffle **14.** However generally, the siphon **12** fills up with condensed vapour produced during the wash cycle.

[0012] If one now refers to figure 3, showing a side perspective view of the tub before its left flange **3** is mounted, one sees that the overfill does not cause any oversizing of the machine, given its position.

[0013] The overflow according to the invention has been designed for top-loading rotating-drum washing machines, but there is no reason it cannot be used on front-loading machines, subject to minor adaptations according to current techniques.

Claims

1. Integrated overflow system for a top-loading rotating-drum washing machine, **characterised in that** it is constituted of a labyrinth **(10)** incorporated in the machine tub body **(1).**

2. Integrated overflow system according to claim 1, **characterised in that** this labyrinth **(10)** is made as a hollow in one side of the machine tub body **(1),** in the junction plane, with one of its lateral flanges **(3),** which overlaps it when it is mounted on the said body **(1).**

3. Integrated overflow system according to claim 1 or 2, **characterised in that** the labyrinth **(10)** is comprised of an ascending baffle **(11)** that begins inside the tub body and communicates with it, opening into a meander that forms a siphon **(12),** which opens into a room **(13)** that includes an L-shaped deflector **(131)** in its upper part, which communicates, on the one hand, with a descending baffle **(14)** next to the ascending baffle **(11)** opening into the open air and, on the other hand, with a nozzle **(15)** connected directly to the room **(13)** and coming out behind the room L-shaped deflector **(131).**

4. Integrated overflow system according to claim 2, **characterised in that** the overlap of the labyrinth **(10),** made in the tub junction plane by one of the corresponding lateral flanges **(3),** is obtained via a plate forming a lid **(31)** of corresponding dimensions, arranged radially to the periphery of the junction plane of the said corresponding flange **(3).**

Amended claims in accordance with Rule 86(2) EPC.

1. Top loading rotating drum horizontal axis washing machine having an integrated overflow system constituted of a labyrinth **(10)** incorporated in the machine tub body **(1) characterised in that** labyrinth **(10)** is made a hollow in one side of the machine tub body **(1)** in the joint face with one **(3)** of its lateral flanges **(3,4)** which overlaps it when it is mounted on the said body.

2. Top loading rotating drum horizontal axis washing machine according to claim 1, **characterised in that** the labyrinth **(10)** is comprised of an ascending baffle **(11)** that begins inside the tub body and communicates with it, opening into a meander that forms a siphon **(12),** which opens into a room **(13)** that includes an L-shaped deflector **(131)** in its upper part, which communicates, on the one hand, with a descending baffle **(14)** next to the ascending baffle **(11)** opening into the open air and, on the other hand, with a nozzle **(15)** connected directly to the room **(13)** and coming out behind the room L-shaped deflector **(131).**

3. Top loading rotating drum horizontal axis washing machine according to claim 2, **characterised in that** the overlap of the labyrinth **(10),** made in the tub joint face by one of the corresponding lateral flanges **(3),** is obtained via a plate forming a lid **(31)** of corresponding dimensions, arranged radially to the periphery of the joint face of the said corresponding flange **(3).**

FIG.1

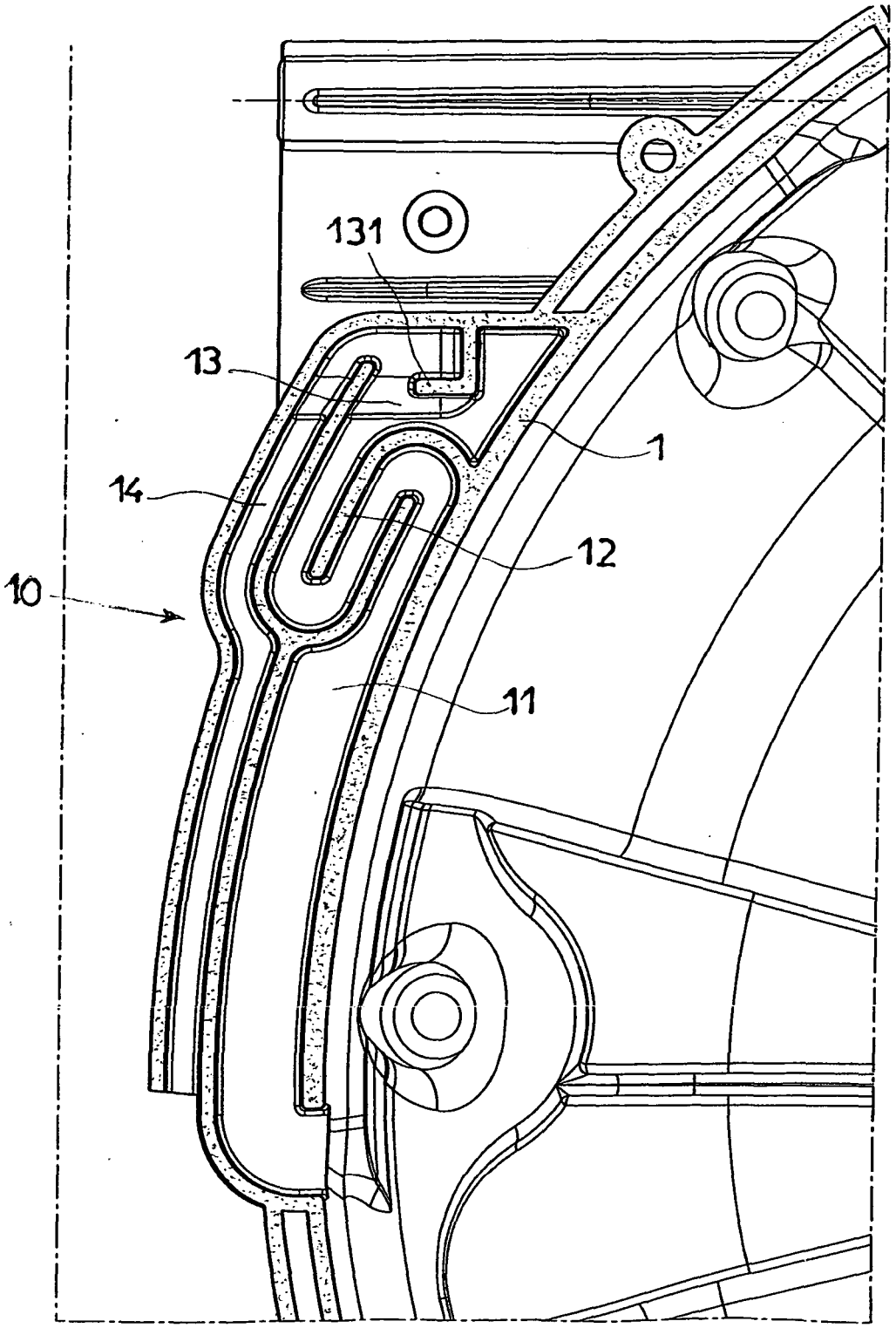


FIG.2

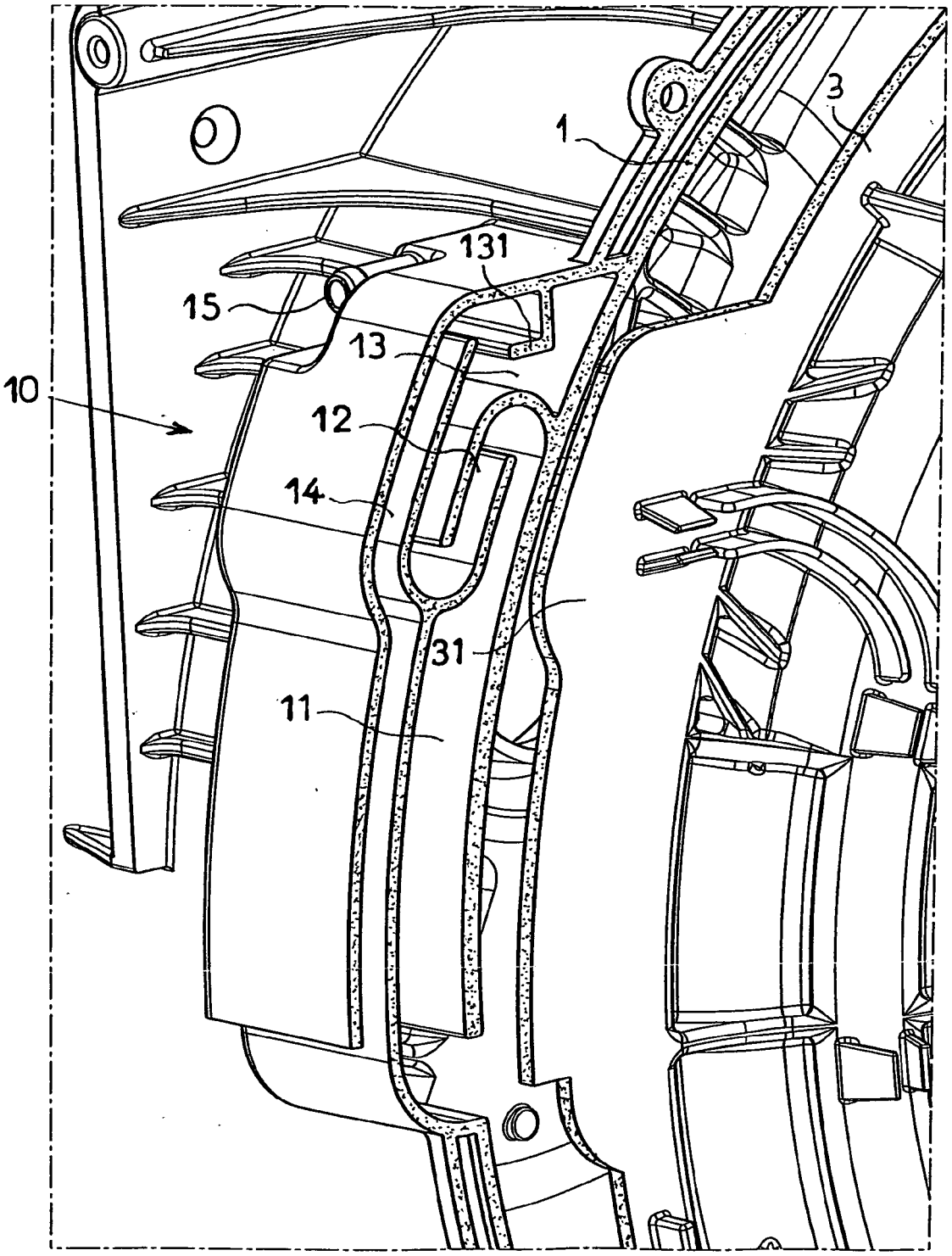
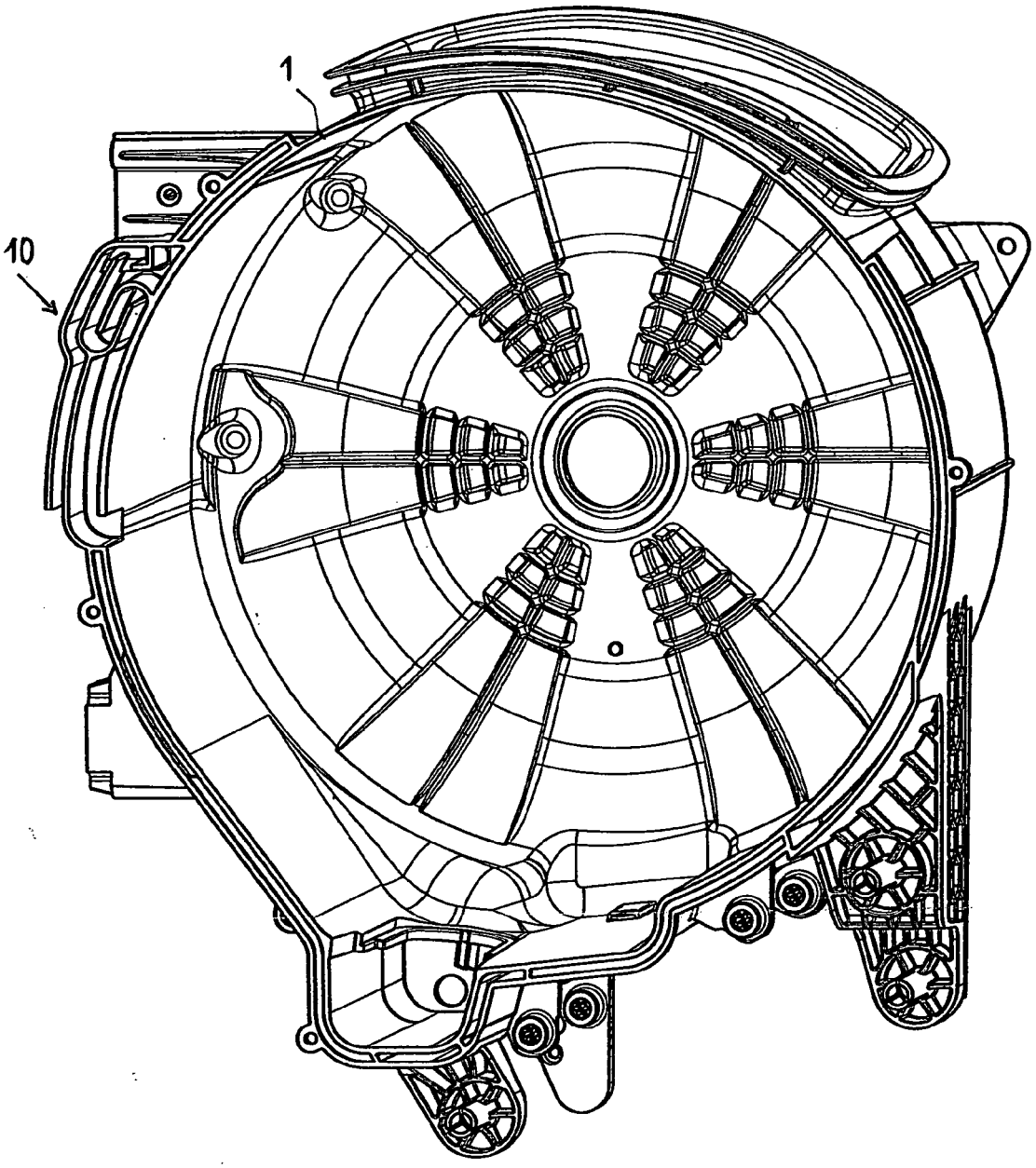


FIG.3



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EUROPEAN SEARCH REPORT

Application Number
EP 06 00 8714

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A	EP 0 110 482 A (AMIENS CONST ELECT MEC [FR]; PHILIPS NV [NL]) 13 June 1984 (1984-06-13) * page 2, line 17 - page 3, line 34; figures *	1,2,4	TECHNICAL FIELDS SEARCHED (IPC) D06F A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 October 2006	FALKENTOFT, C

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 00 8714

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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16-10-2006

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