



(51) International Patent Classification:

B60K 15/03 (2006.01) *B60K 13/04* (2006.01)
B60K 15/077 (2006.01) *B29C 45/00* (2006.01)

(21) International Application Number:

PCT/EP2014/055530

(22) International Filing Date:

19 March 2014 (19.03.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10 2013 004 928.8 22 March 2013 (22.03.2013) DE

(71) Applicant: KAUTEX TEXTRON GMBH & CO. KG
[DE/DE]; Kautexstr. 52, 53229 Bonn (DE).

(72) Inventors: LÜHN, Holger; Fahrstraße 2a, 53757 St. Augustin (DE). SCHUMACHER, Nicolai; Berghovenerstraße 76, 53227 Bonn (DE).

(74) Agent: KIERDORF, Ritschel; Kautex Textron GmbH & Co. KG, Sattlerweg 14, 51429 Bergisch Gladbach (DE).

(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, BN, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,

[Continued on next page]

(54) Title: OPERATING FLUID CONTAINER FOR A MOTOR VEHICLE

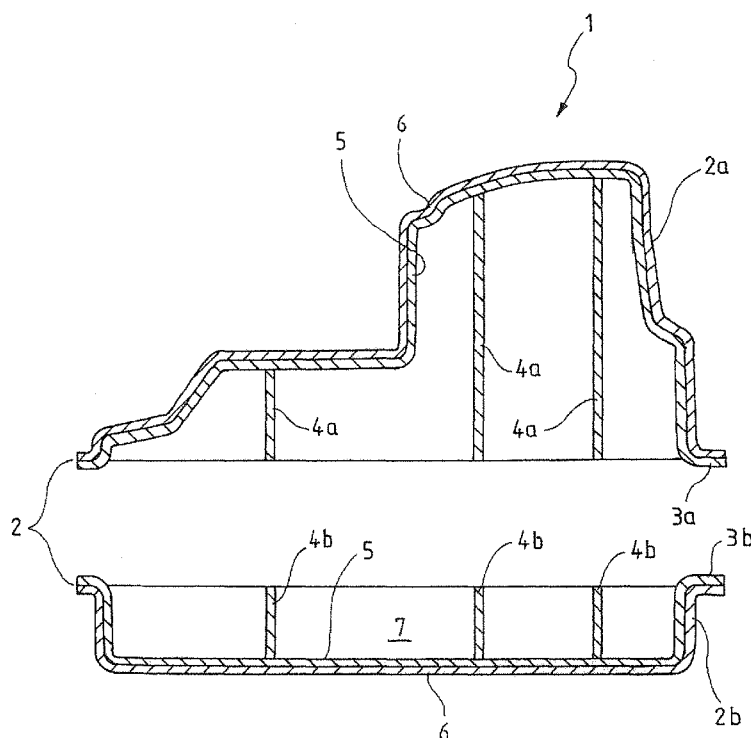


Fig. 1

(57) Abstract: The invention relates to an operating fluid container (1) for a motor vehicle, comprising a container body, which is made up of two shells (2, 2a, 2b) of thermoplastic material that complement one another and are welded peripherally to one another to form a substantially closed hollow body, at least one shell (2) having a multi-layered wall structure, and at least one layer being in only a certain area or in certain areas from a thermoplastic material comprising a thermally and/or electrically conductive filler and being in at least one other area from a non-filled thermoplastic material.



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, KM, ML, MR, NE, SN, TD, TG).

— *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))*

Published:

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

Operating fluid container for a motor vehicle

The invention relates to an operating fluid container for a motor vehicle, comprising a container body, which
5 is made up of at least two injection-molded shells that complement one another and are welded peripherally to one another to form a substantially closed hollow body.

Such an injection-molded container is known for example
10 from EP 0 775 606 A2. This container is made up of two container halves, which are produced by the injection-molding process and welded to one another. The interior space of the container is divided by partitions into
15 separate chambers, which are in connection with one another by way of through-openings in the partitions. These partitions on the one hand favorably influence the stability of the container, on the other hand they achieve favorable surging behavior with reduced surging noises in the container.

20 By contrast with thermoformed or blow-molded plastic containers, injection-molded plastic containers have in principle the advantage that inserts, such as for example baffles or surge tanks, can be integrally
25 molded on during the production of the container halves to be welded to one another, whereas in the case of blow-molded containers such parts either have to be welded during their molding to one or more preforms to be produced or have to be subsequently fitted into the
30 finished container. In particular when inserts are subsequently attached, it must be ensured that the inserts are compatible with the container wall in the sense of weldability, that is to say the inserts and the container wall must be made of the same or similar
35 plastics.

Apart from aspects such as the stability of the container and the arrangement of functional inserts,

- 2 -

other design aspects also play a part in the production of unfixed containers for motor vehicles, in particular in the case of containers for operating fluids for motor vehicles. Containers for fuel additives or urea
5 reservoirs for selective catalytic nitrogen-oxide control and also containers for windshield cleaning fluid are often heated, and so the thermal properties of the container play a part; the container possibly has to be insulated.

10

In the case of operating fluid containers such as fuel tanks, under some circumstances it is necessary to protect the container in the installed position from the thermal effects caused by the exhaust system of the
15 motor vehicle, for example with heat shields. Furthermore, the container must then possibly meet specific fire protection requirements.

20

In the case of fuel tanks, diffusion resistance of the system with respect to possibly escaping hydrocarbons is also important in particular. As is known, plastics based on HDPE are not diffusion-resistant to hydrocarbons, and so fuel tanks of thermoplastic often have to be of a multilayered form and comprise barrier
25 layers for hydrocarbons. Such fuel tanks are predominantly produced by thermoforming or extrusion blow-molding, the preforms or semifinished products used for this respectively consisting of multi-layered extrudates, which are shaped or molded into containers
30 in one or more stages.

35

In the case of fuel tanks comprising injection-molded half-shells, it is known for example to make them up respectively from a multi-shell upper piece and a
multi-shell lower piece. Such a fuel tank is known for example from US 5,398,839 A. This describes an injection-molded fuel tank that is assembled from two

- 3 -

multi-layered half-shells, these half-shells being respectively made up of an inner shell and an outer shell of injection-molded plastic. Respectively formed between the inner shell and the outer shell is a cavity, which is filled with a fuel-adsorbing material. This material is a granular adsorbent, which is subsequently introduced into the cavity between the shells. This requires sealing of the shells with respect to one another, the inner shell being provided with molded-on nipples and built-in structural elements, the nipples passing through openings in the outer shell and the nipples being sealed off in the region of the passages through the outer shell.

Complex molds with slides and cores are required for producing such an injection-molded container of a relatively complex design.

A further injection-molded container of the aforementioned type is known for example from DE 199 09 041 A1, one configuration of the container described there providing that it is of a double-walled form. It comprises an arrangement with two containers enclosing one another. Each of the containers comprises two shell parts that are welded to one another. The shell parts of the outer container bear on their inner sides a number of spacers for securing the inner container.

The invention is therefore based on the object of providing an operating fluid container for a motor vehicle that can be produced particularly easily and inexpensively and can be designed with regard to its thermal properties and with a view to the sealing requirements for a specific intended application by simple means.

- 4 -

The object on which the invention is based is achieved by the features according to claims 1 and 11, advantageous embodiments of the invention can be taken from the dependent claims. The operating fluid
5 container according to one aspect of the invention comprises a container body, which is made up of two injection-molded shells that complement one another and are welded peripherally to one another to form a substantially closed hollow body, at least one shell
10 having a multi-layered wall structure obtained by a co-injection process during the injection-molding.

A further aspect of the invention is based on the idea of bonding together two or more plastics to form at
15 least one container shell by a co-injection process in such a way that the desired properties of the shells with a view to the later application of the container are obtained. Thus, for example, plastics that are not necessarily compatible with one another in the sense of
20 weldability can also be processed with one another. The method also has the advantage in particular that, apart from a different distribution of the materials or the thermoplastics in the sense of inside and outside, a locally different surface-area distribution can be
25 achieved, and so it is possible for example to achieve a thermal shielding or insulation of a container only in specific locations that are exposed in the installed position of the container. As a result, the otherwise customary shielding measures, for example heat shields
30 attached to the outside of the container, are avoided.

For the purposes of the present invention, an operating fluid container may be understood as meaning a washer fluid container, an oil container, a secondary oil
35 container, a cooling liquid container for air conditioning systems or what is known as an SCR container for receiving urea solution for catalytic

- 5 -

exhaust reduction. In addition, a fuel tank for receiving gasoline or diesel fuels may also be formed as an operating fluid container.

5 The container according to the present invention may have internals for feeding the fluid contained in it and also means for letting air in and out. In addition, the container may also have heating devices, sensors, filters or the like, depending on whether the container
10 is designed as a fuel tank or for example as a urea reservoir or as a wiper fluid container.

In the case of an expedient and advantageous variant of the operating fluid container according to the
15 invention, an inner layer of at least one shell may for example have integrally molded-on structures, for example in the form of baffles, partitions, reinforcing ribs, surge tanks or the like.

20 For the purposes of the present application, an inner layer is a layer facing the volume of the container, whereas an outer layer is an outer layer forming the enveloping curve of the container.

25 In the case of a preferred and expedient variant of the operating fluid container according to the invention, it is provided that at least one shell comprises at least two layers of different thermoplastics. Different thermoplastics are, for example, plastics that are
30 molecularly different, for example polyolefins on the one hand and polyamides on the other hand. In addition, it is of course possible to produce a shell from at least two layers of the same or similar plastics of different strengths or with different fillers.

35

From the aspect of the thermal properties of the container, it is particularly expedient if at least one

- 6 -

layer of at least one shell comprises a thermally
conductive filler. The thermally conductive filler of a
layer is provided only in a certain region, for example
only in specific regions of a lower shell of the
5 operating fluid container or in the region of the
arrangement of a container heater.

"In a certain region" in the sense of the present
invention means area by area in basically one plane.

10

A thermally conductive plastic may for example be
arranged in an inner layer of a shell in such a way
that the heat of a heating element arranged in the
operating fluid container can be passed on selectively
15 to specific locations of the container. In particular
whenever the operating fluid container is designed as a
container for an aqueous additive for nitrogen oxide
control, it is desirable to keep the operating fluid
container free from ice, or defrost it with preference,
20 in specific locations in the situation where it is
installed in the motor vehicle. This may be in
particular in the region of a feed pump arranged in the
container.

25 Depending on the distribution and type of thermally
conductive filler, an isotropic or anisotropic heat
conducting behavior of the container may be achieved in
specific regions.

30 For example, a thermally conductive filler or at least
one thermally conductive insert may be arranged in at
least one layer of at least one shell in such a way
that in the area concerned an insulation of the volume
of the container is reversed. For example, in this way
35 cold bridges can be provided in an outer shell of the
container, allowing a selective/controlled freezing
behavior of the fluid that may be stored in the

- 7 -

container to be brought about when the ambient temperature falls below the freezing point. This may serve the purpose of keeping specific critical regions within the container initially free from ice. These
5 critical regions may be for example feed pumps, filters, valves or the like.

For example, at least one metal insert may be arranged in the container in such a way that it protrudes into
10 the volume of the container, for example by means of one or more projections, so that a liquid/solid phase transition takes place at these locations first. This results in a delay in the phase transition in other regions of the volume that is enclosed by the
15 container.

It is particularly expedient if an electrically conductive filler is provided as the filler. A filler on a carbon basis, for example graphite or carbon
20 black, comes into consideration as the filler. Alternatively, a metal filler dispersed in a thermoplastic matrix may be provided as the filler.

With particular preference, the filler comprises carbon
25 nanotubes. Such carbon nanotubes (also CNTs) are small tube-shaped formations of carbon, which on the one hand, when added in a specific amount, make the thermoplastic electrically conductive and on the other hand may be designed for producing heat-conducting
30 inserts, layers or sheets in the regions concerned of a container shell.

The layer comprising the filler is preferably an inner layer of the container. This is advantageous in
35 particular whenever the container is heated or comprises a heating device.

- 8 -

In the case of a further expedient variant of the operating fluid container according to the invention, it is provided that at least one shell has at least one cavity enclosed by two layers. This cavity, which may
5 for example be filled with air or gas, may improve the insulating properties of the operating fluid container in certain regions. In addition, when there is heating of the operating fluid container, on the one hand a favorable distribution of the heat output over the
10 volume of the operating fluid container can be achieved by a thermally conductive inner layer, while at the same time a cavity filled with air or gas can provide sufficient insulation at the locations concerned of the operating fluid container, and so optimum use of the
15 heat output that is introduced into the volume of the operating fluid container is possible.

In the case of an advantageous variant of the operating fluid container according to the invention, it is
20 provided that at least one shell comprises three layers of different thermoplastics, an inner layer that is facing the interior of the container being thermally conductive, an intermediate layer having insulating properties and an outer layer serving substantially for
25 the structural strength of the container. An inner layer may for example comprise a carbon-filled polyamide, an intermediate layer may comprise an expanded thermoplastic and an outer layer may comprise a polyolefin, for example an HDPE. The intermediate
30 layer of expanded plastic may serve both as an insulator and as a supporting layer.

With particular preference, the layer comprising the filler is electrically connected and heatable.
35

The advantageous features of the operating fluid container according to the present invention as

- 9 -

described herein so far may be provided at an operating fluid container either separately or in combination with each other.

- 5 The invention furthermore comprises a process for manufacturing an operating fluid container for a motor vehicle, comprising a container body, which is made from thermoplastic material, the method comprising the following steps:
- 10 - injection molding of at least two shells of thermoplastic material, which complement each other,
- fusing together the shells to form an essentially closed hollow body, thereby at least providing
- 15 one of the shells by co-injection such that said shell comprises a multi-layer wall structure.

Preferably, at least one layer of at least one shell will be provided with a thermally and/or electrically

20 conductive filler and will be produced in a certain region or in certain regions from a filled thermoplastic material, the filled thermoplastic material thereby being arranged within the non-filled thermoplastic material such that the filled

25 thermoplastic material forms at least one heat-conducting trace or at least one heat-conducting area, which extends parallel to the layer boundaries of superimposed layers.

30 The filler, preferably in the inner layer, may be arranged in a pattern of heat conducting traces in the inner layer of the container shell concerned.

The invention is explained below on the basis of an

35 exemplary embodiment that is represented in the drawings, in which:

- 10 -

Figure 1 shows a sectional exploded view of an operating fluid container according to the invention,

5 Figure 2 shows a section through a wall of a shell of the operating fluid container according to the invention as provided by a second exemplary embodiment of the invention,

10 Figure 3 shows a section through a wall of a shell of the operating fluid container as provided by a third exemplary embodiment of the invention and

15 Figure 4 shows a cross section through a lower shell of an operating fluid container according to the invention, which allows a plan view of the bottom of the container.

20 The operating fluid container 1 according to the invention is substantially made up of two injection-molded shells 2a, 2b, the shell 2a forming an upper shell and the shell 2b forming a lower shell of the operating fluid container 1. The shells 2 respectively
25 form a peripheral flange 3a, 3b, at which the shells 2 are welded to one another to form the closed operating fluid container 1. Each of the shells 2 was obtained by co-injection molding, both the upper shell and the lower shell 2a, 2b respectively having integrally
30 molded-on structures in the form of separating wall elements 4a, 4b.

In the case of the exemplary embodiment of the invention that is represented in Figure 1, the shells 2
35 are respectively of a two-layered form and comprise an inner layer 5 and an outer layer 6.

- 11 -

The inner layer 5 and the outer layer 6 may consist of molecularly different thermoplastics, but they may also be formed from the same thermoplastics with different fillers, or be respectively filled and unfilled.

5

Finally, the layers may also be formed in such a way that for example in certain regions the inner layer 5 is filled and the outer layer 6 is not filled.

10 In the case of the operating fluid container 1 that is shown in Figure 1, the lower shell 2 may for example be provided with a thermally conductive, electrically connectable filler in a volume 7 that is divided off by the separating wall elements 4b, and so the volume 7
15 may serve for example as a melting volume for an aqueous additive that is stored in the operating fluid container 1 for nitrogen-oxide control. This volume 7 may for example serve as a pump sump for a feed pump (not shown). For example, in the container there may
20 also be formed a partial volume of a thermoplastic that is provided with a thermally conductive filler, in order for example to concentrate the heating output of a heating device on a specific partial volume of the operating fluid container 1.

25

A variant of the operating fluid container 1 according to the invention is represented in Figure 2, which merely shows a partial section through a shell 2. The shell concerned, which may be both the upper shell 2a
30 and the lower shell 2b or else both shells 2a and 2b, comprises an inner layer 5 of a filled thermoplastic, an outer layer 6 of a non-filled thermoplastic and a cavity 8, which acts as an insulator and is filled with air or gas. The cavity may only be provided in specific
35 regions of the shell 2 concerned of the operating fluid container 1.

- 12 -

The variant of the operating fluid container 1 according to the invention that is represented in Figure 3 differs from the variant that is represented in Figure 2 in that an intermediate layer 9 of a supporting foam is provided instead of a cavity.

Figure 4 shows a plan view of the bottom 10 of a lower shell 2b of an operating fluid container according to the invention, in which the inner layer 5 has an insert 11 of a filled thermoplastic. The insert 11 is let into or applied to the bottom 10 of the lower shell 2b, for example in the form of a cross-shaped pattern, and comprises for example electrically conductive carbon, for example in the form of carbon nanotubes, as the filler. The insert 11 is provided with electrical contacts 12 and can consequently be supplied with current as a heating element and as a heating body/heat-conducting body. The electrical connections required for this to a voltage source may be led to the outside through the lower shell 2b or be laid in the interior of the container.

- 13 -

List of reference signs

1	Operating fluid container
2a	Upper shell
2b	Lower shell
3a, 3b	Flange
4a, 4b	Separating wall elements
5	Inner layer
6	Outer layer
7	Volume
8	Cavity
9	Intermediate layer
10	Bottom
11	Insert
12	Contacts

Patent claims

1. An operating fluid container (1) for a motor vehicle, comprising a container body, which is made up of at least two shells (2) of thermoplastic that complement one another and are welded peripherally to one another to form a substantially closed hollow body, at least one shell (2) having a multi-layered wall structure, at least one layer of at least one shell comprising a thermally and/or electrically conductive filler, at least one layer of at least one shell being in only a certain region or in certain regions made from a thermoplastic material comprising a thermally and/or electrically conductive filler and being in at least one other region made from a non-filled thermoplastic material, the filled the thermoplastic material forming within the non-filled thermoplastic material at least one heat-conducting trace or at least a heat-conducting area, which extends parallel to the layer boundary of superimposed layers.
2. The operating fluid container as claimed in claim 1, characterized in that the container at least in a certain region has an anisotropic heat-conductive behaviour.
3. The operating fluid container as claimed in claim 1 or 2, characterized in that at least one shell (2) comprises at least two layers of different thermoplastics.
4. The operating fluid container as claimed in either of claims 1 to 3, characterized in that a thermally conductive filler or at least a thermally conductive insert is arranged in at least one layer

of at least one shell (2) in such a way that in the area concerned an insulation of the volume of the container is reversed.

5. The operating fluid container as claimed in one of claims 1 to 4, characterized in that the filler comprises carbon nanotubes.
6. The operating fluid container as claimed in one of claims 1 to 5, characterized in that the layer comprising the filler forms an inner layer 5 of the container.
7. The operating fluid container as claimed in one of claims 1 to 6, characterized in that at least one shell (2) forms at least in certain regions at least one cavity enclosed by two layers.
8. The operating fluid container as claimed in one of claims 1 to 7, characterized in that at least one shell (2) comprises three layers of different thermoplastics, an inner layer (5) that is facing the interior of the container being thermally conductive and/or electrically conductive at least in certain regions and an intermediate layer (9) having insulating properties at least in certain regions.
9. The operating fluid container as claimed in claim 8, characterized in that the inner layer (5) comprises a thermally conductive filler and the intermediate layer (9) comprises an expanded thermoplastic.
10. The operating fluid container as claimed in one of claims 1 to 9, characterized in that the layer comprising the filler is electrically connected and heatable.

11. Process for manufacturing an operating fluid container (1) for a motor vehicle comprising a container body, which is made from thermoplastic material, the process comprising the following steps:
- injection-molding of at least two shells of thermoplastic material, which complement each other,
 - fusing together the shells to form an essentially closed hollow body, and
- at least producing one of the shells by co-injection with a multi-layer wall structure.
12. Process according to claim 11, characterized in that at least one layer of at least one shell in at least one region is produced from a thermoplastic material with a thermally and/or electrically conductive filler and in that at least one other region is produced from a non-filled thermoplastic material, the filled thermoplastic material being arranged within the non-filled thermoplastic material such that the filled thermoplastic material forms at least one conductive trace or area.

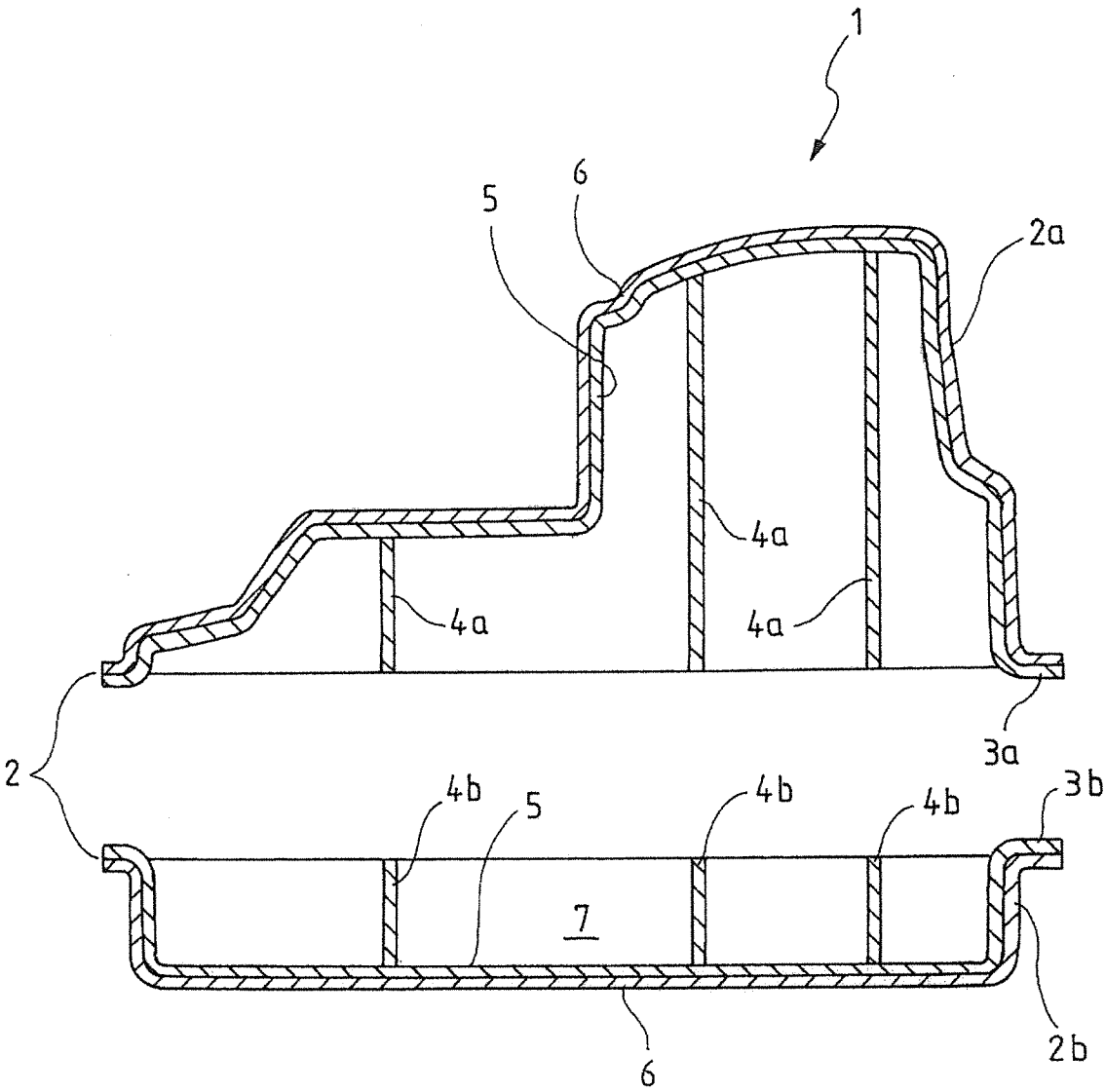


Fig. 1

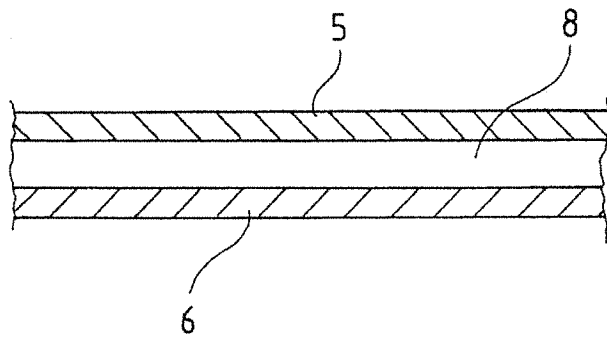


Fig. 2

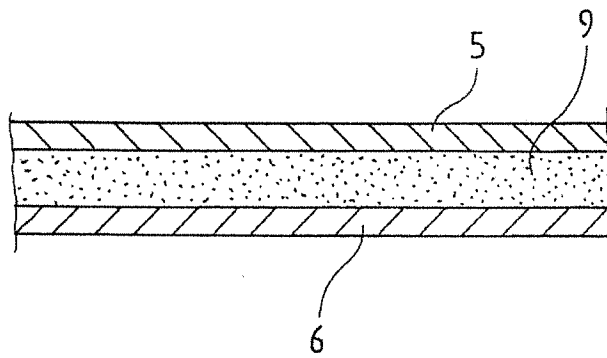


Fig. 3

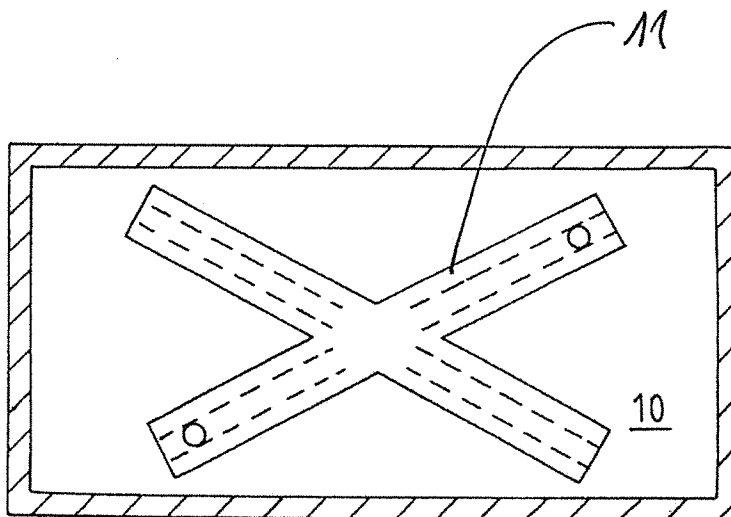


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/055530

A. CLASSIFICATION OF SUBJECT MATTER
INV. B60K15/03 B60K15/077 B60K13/04 B29C45/00
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)
B60K B29C B29L

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 852 296 A1 (FIAT RICERCHE [IT]) 7 November 2007 (2007-11-07) paragraphs [0008], [0012], [0015], [0017] figures 2, 3	1-9, 11, 12
X	JP 2004 098886 A (FTS KK; TOYOTA MOTOR CORP) 2 April 2004 (2004-04-02) abstract figures 1, 3, 6-8	1-3, 10-12
A	US 2004/188418 A1 (AISENBREY THOMAS [US]) 30 September 2004 (2004-09-30) paragraphs [0049], [0059] figure 7	1-3, 10-12
	----- -/-	



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

30 July 2014

Date of mailing of the international search report

12/08/2014

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Adacker, Jürgen

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/055530

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 663 822 B1 (CARGILL LYNN E [US] ET AL) 16 December 2003 (2003-12-16) abstract column 2, lines 22-61 column 5, lines 56-63 figure 1 -----	1-4,8,9
A	US 6 719 163 B1 (DELBARRE PIERRE [FR] ET AL) 13 April 2004 (2004-04-13) column 3, lines 35-38 -----	1,7
A	DE 10 2009 029665 A1 (BOSCH GMBH ROBERT [DE]) 14 April 2011 (2011-04-14) paragraphs [0003], [0016] - [0031] figures 1-5 -----	1-3,10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2014/055530

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1852296	A1	07-11-2007	NONE
JP 2004098886	A	02-04-2004	NONE
US 2004188418	A1	30-09-2004	NONE
US 6663822	B1	16-12-2003	AT 363374 T 15-06-2007
		AU 3913500 A 09-10-2000	
		BR 0010835 A 15-01-2002	
		CA 2367819 A1 28-09-2000	
		CN 1344201 A 10-04-2002	
		DE 60035043 T2 24-01-2008	
		DK 1185410 T3 24-09-2007	
		EP 1185410 A1 13-03-2002	
		HK 1046115 A1 25-08-2006	
		JP 2002539970 A 26-11-2002	
		JP 2007290405 A 08-11-2007	
		MX PA01009614 A 02-08-2004	
		US 6663822 B1 16-12-2003	
		WO 0056520 A1 28-09-2000	
US 6719163	B1	13-04-2004	BR 0004476 A 10-04-2001
		DE 19946530 A1 29-03-2001	
		US 6719163 B1 13-04-2004	
DE 102009029665	A1	14-04-2011	NONE