



(43) International Publication Date
26 June 2014 (26.06.2014)

(10) International Publication Number
WO 2014/094919 A1

(51) International Patent Classification:
B60K 15/03 (2006.01)

(21) International Application Number:
PCT/EP2013/000758

(22) International Filing Date:
14 March 2013 (14.03.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10 2012 024 787.7
19 December 2012 (19.12.2012) DE

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

(72) Inventors: **EBERHARDT, Agnes**; Rheindorferstrasse 38,
53225 Bonn (DE). **KARSCH, Ulrich**; Aggerstrasse 24,
53859 Niederkassel (DE). **KOLL, Friedbert**; Mühlen-
bergweg 18, 53489 Sinzig (DE). **WAGNER, Thomas**;
Zum Vogelrutherfeld 106, 50170 Kerpen (DE).

(74) Agent: **KIERDORF, Theodor**; Kierdorf Ritschel Pat-
entanwälte PartG mbB, Sattlerweg 14, 51429 Bergisch
Gladbach (DE).

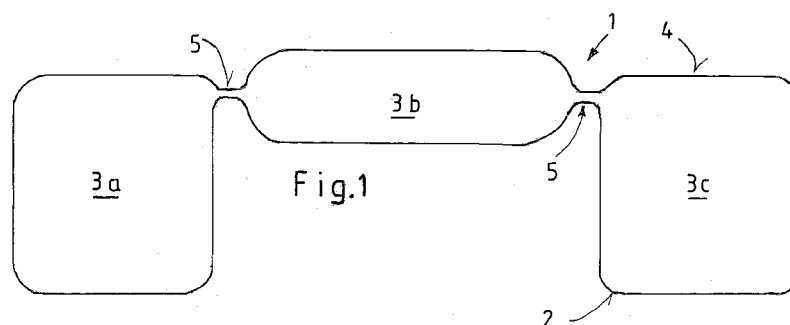
(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, JP, KE, 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, PA, 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, 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).

Published:

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

(54) Title: VARIABLE FLUID CONTAINER MADE OF THERMOPLASTIC MATERIAL



(57) Abstract: The invention relates to a variable fluid container (1) made of thermoplastic material for a motor vehicle, comprising at least two chambers (3a, 3b, 3c) separated from one another and not directly communicating with one another for receiving different fluids, wherein the fluid container (1) is configured in one piece.

Variable fluid container made of thermoplastic material

The invention relates to a variable fluid container made of thermoplastic material for a motor vehicle.

5

Such containers may, for example, be containers for receiving fuel or containers for receiving windshield washer fluid or containers for oil or containers for liquid additives for exhaust gas denitrification or
10 exhaust emission control or coolant expansion tanks.

In principle, fluid containers made of plastics material in motor vehicles are used for receiving fluids of very different types. For each container,
15 there are individual development, tool and production costs. Some of the containers installed in the motor vehicle require heating, others require relatively costly aeration and ventilation systems.

20 According to the prior art, each fluid and/or each medium is stored in a separate container, wherein the different containers are positioned at different points in the motor vehicle. To this end, it is necessary to provide corresponding fastening points in the body of
25 the motor vehicle, corresponding installation space within the body having to be allowed for at different points.

Finally, it is necessary for each container to provide
30 separate aeration and ventilation systems/filling level indicators as well as filling systems.

The object of the invention is to provide a variable fluid container which takes into account the problems
35 set forth above.

The object of the invention is also to provide a method for producing such a variable fluid container.

The object is initially achieved by a variable fluid container made of thermoplastic material for a motor vehicle, comprising at least two chambers separated from one another and not directly communicating with one another for receiving different fluids, wherein the fluid container is configured in one piece.

Such a configuration of the fluid container conceals a considerable cost-saving potential during the implementation thereof. Thus, for example, a plurality of operating fluids such as fuel, on the one hand, and, for example, windshield washer fluid or an additive for selective catalytic exhaust gas denitrification, on the other hand, may be arranged in one container body. Said container body may be arranged at a corresponding point of the body such that fastening points for a plurality of containers are dispensed with. Fastening systems such as tensioning straps and tank clips are also dispensed with here. Just one receiving space has to be provided inside the body for receiving said multichamber container according to the invention.

Finally, such a multichamber system/multitank system may be produced in a single production process.

In an expedient and advantageous variant of the fluid container according to the invention, it is provided that each of at least two chambers is arranged completely outside the respective other chamber. In other words, the individual chambers of the fluid container are arranged relative to one another such that the volume of one chamber does not negatively affect the volume of a further chamber (one container within another container).

For example, at least two chambers may be arranged adjacent to one another for receiving different media. When, for example, three chambers are arranged adjacent

to one another, two chambers for receiving an additive or for receiving a windshield washer fluid, for example, may sit adjacent to a chamber for receiving fuel, so that the lateral chambers, for example, form
5 an impact protection for the central chamber.

The size of the chambers is expediently dimensioned such that the storage volume thereof ensures sufficient storage of the relevant operating fluid of the motor
10 vehicle according to the level of consumption.

Expediently, at least two chambers adjoin one another via a common partition. Via such a common partition, for example, a heat exchange may also take place
15 between the two chambers, wherein for example one chamber may store diesel fuel and the immediately adjacent chamber may store urea solution for catalytic exhaust gas denitrification. The fuel supply system for the fluid container in this case preferably comprises a
20 hot diesel return flow of the fuel which at partial load is not removed from the injection system of the internal combustion engine. This hot feed volume may advantageously be used to heat and/or defrost the urea container.

25 In an advantageous variant of the fluid container according to the invention, it is provided that at least two chambers are formed by at least one stamped portion or by pulling in or pushing in at least one
30 common container wall.

As already mentioned above, it may be provided that at least one chamber is arranged between at least two further chambers, wherein the respective outer chambers
35 are expediently filled with a non-combustible or non-explosive fluid, so that the outer chambers form impact protection for the internal chamber.

In a particularly expedient and clever design of the fluid container according to the invention, it may be provided that at least one chamber at least partially encloses at least one further chamber, preferably over
5 a lateral periphery of at least 50% in the installed position.

For example, a chamber may of torus-shaped configuration and completely enclose an internal
10 chamber. Naturally, other geometries are also conceivable depending on the installed position and/or the installation space available in the motor vehicle.

In a particularly advantageous variant of the fluid
15 container according to the invention, it is provided that the container body is configured to be at least partially double-walled and is provided with at least one delivery flow connector and return flow connector for a heat exchanger volume. In this manner, for
20 example, at least one chamber of the fluid container may be indirectly heated by a heating medium, for example by a return flow of coolant from the internal combustion engine of the motor vehicle.

25 It is expedient, for example, if a double-walled region of the container body defines a plurality of chambers or is adjacent to a plurality of chambers. Expediently, the fluid container comprises at least one filler pipe which comprises a plurality of channels as filling
30 and/or ventilation channels, wherein the channels are connected together in one piece at least via a longitudinal portion of the filler pipe and are branched into a plurality of chambers. In principle, filling systems may be provided on a variable fluid
35 container according to the invention as filler pipes or filler necks on the respective chambers. Preferably, however, multipart filler pipes are used which are combined to form a single filler pipe arrangement,

wherein as already mentioned above, at least portions of the filling path may be formed by channels connected together in one piece.

5 To this end, for example, the filler pipes may be produced from one production process. They may be extrusion blow-molded, for example, wherein two or more lines are pinched off from an extruded tube during the blow-molding process.

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A filler head which is possibly required with, for example, a nozzle guide, venting valves and closure lid may be made as a single or multipart filler head by injection-molding, blow-molding or other production
15 methods. The filler head may be designed for filling one or more fluids, but said filler head may also consist of an upper part and a lower part. The filler head upper part may be provided with a common closure, optionally also with a closure appropriate to the
20 medium. In the blow-molding method, for example, it is possible to blow-mold the filler pipe onto a prefabricated filler head.

Preferably, the filler pipe comprises at least one
25 filler connector as the filler head, which comprises at least two separate orifice guides and/or orifice connectors for a nozzle or a filling arrangement, wherein the filler head is preferably attached to the filler pipe as a separate component.

30

In a particularly preferred embodiment of the fluid container according to the invention, it is provided that the container body is configured as a saddle tank and in the installed position extends inside the motor
35 vehicle partially above and partially adjacent to an exhaust gas system of the motor vehicle so that, for example, the exhaust gas heat may be used for heating at least one container volume.

The object of the invention is further achieved by a method for producing a variable fluid container having the above-described features, wherein the method comprises the following: at least the container body is
5 produced in one piece by extrusion blow-molding of at least one tubular or web-like extrudate made of thermoplastic material, wherein at least two chambers are formed by wall-to-wall welding of the preform in a blow-molding tool.

10

Alternatively, a suitable method for producing a variable fluid container of the above-described type comprises the injection-molding of thermoplastic material to form at least two shell-shaped semi-
15 finished products and the welding of the semi-finished products to form a substantially closed container body, forming chambers which are sealed relative to one another and separated at least inside the container body.

20

According to the invention, the use of a variable fluid container made of thermoplastic material for storing at least two different fluid media is also claimed, wherein the chambers adjacent to one another or located
25 above or below one another are filled with different media, such that the temperature of one medium may be used for heating another medium.

A further aspect of the present patent application
30 which is essential to the invention is the arrangement of the chambers to be heated of the multichamber tank system such that, for example, the exhaust gas heat of a motor vehicle may be used to heat the relevant chamber due to the convective heat input or also due to
35 the radiation heat input via the exhaust gas system of the motor vehicle.

The variable container according to the invention may

be configured, for example, as a wheel housing container or as an elongate container arranged directly below the windshield inside the body or inside the engine compartment of a motor vehicle, for receiving a plurality of different operating fluids.

The invention is described hereinafter with reference to an exemplary embodiment shown in the drawings, in which:

10

figure 1: shows a schematic view of a fluid container according to the invention as a saddle tank for a motor vehicle,

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figure 2: shows a plan view of the container shown in figure 1,

figure 3: shows a second variant of the fluid container according to the invention,

20

figure 4: shows a third variant of the fluid container according to the invention,

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figure 5: shows a schematic view of a possible installed position of the fluid container shown in figure 4,

figure 6: shows a fourth variant of a fluid container according to the invention,

30

figure 7: shows a fifth variant of the fluid container according to the invention,

figure 8: shows a sixth variant of the fluid container according to the invention,

35

figure 9: shows a seventh variant of the fluid container according to the invention,

- figure 10: shows a partial sectional view through the container in figure 9 along the line X-X,
- 5 figure 11: shows an eighth variant of the fluid container according to the invention,
- figure 12: shows a ninth variant of the fluid container according to the invention,
- 10 figure 13: shows a schematic view of a heated chamber of the fluid container according to the invention,
- 15 figure 14: shows a variant of a filler pipe on a fluid container according to the invention,
- figure 15: shows a further variant of a filler pipe on a fluid container according to the invention,
- 20 figures 16 & 17: show in each case the filler head lower parts of a two-part filler head,
- 25 figure 18: shows a filler head upper part of a two-part filler head,
- figure 19: shows a part of a common closure system for the filler head upper part in figure 18 and
- 30 figure 20: shows a basic sketch of a fluid container according to the invention with a common filling and venting system.
- 35

A first variant of the fluid container 1 according to the invention is, for example, shown in figures 1 and 2. The fluid container 1 comprises a container body 1 produced in one piece and/or integrally, made of thermoplastic material and which as a whole forms three chambers of which a first chamber 3a is configured to receive fuel, a second chamber 3b to receive a liquid additive for exhaust gas denitrification, preferably a urea solution, and a third chamber 3c to receive a windshield washer fluid. The container body 2 has preferably been extrusion blow-molded and comprises a container wall 4 which has been welded in an extrusion blow-molding tool in the region of constrictions 5 of the fluid container 1 to the respectively opposing container wall 4, and namely by pinching and/or compressing the preform(s) in the blow-molding tool, so that the relevant regions of the preforms have been welded together to form the chambers 3a, 3b, 3c.

Each of the chambers 3a, 3b, and 3c represents a partial volume of the fluid container which is closed per se. The chambers 3a, 3b and 3c are sealed relative to one another and do not communicate with one another inside the container body 2.

Each of the chambers 3a, 3b, 3c is provided with means for aeration and/or ventilation which for the sake of simplicity are not shown in the figures. Moreover, each of the three chambers 3a, 3b, 3c is provided with a filler opening or a filler connector or a filler pipe.

In the exemplary embodiment of the fluid container 1 shown in figures 1 and 2, said fluid container is configured as a so-called saddle tank and in the installed position is arranged inside a motor vehicle, for example beneath the rear seat bench of the motor vehicle so that said fluid container extends above an exhaust gas system and a cardan shaft or a rear axle

differential of a motor vehicle. In the installed position shown in figure 1, the free space 6 extending below the second chamber 3b is taken up by the exhaust gas system and/or the cardan shaft and/or the rear axle differential of the motor vehicle. At least one part of the container body 2 is then shielded relative to the exhaust gas system of the motor vehicle by means of heat protection plates.

10 The arrangement of the heat protection plates may be selected so that, for example, the third chamber 3c may be heated directly by the radiation heat and by the convective heat from the exhaust gas system of the motor vehicle.

15 A second variant of a fluid container 1 according to the invention is shown in figure 3, wherein said fluid container 1 is configured as a wheel housing container and accordingly has two chambers 3a and 3b separated from one another in the longitudinal direction, and which in each case are configured to be circular segment-shaped in the longitudinal direction.

25 A further variant of a fluid container 1 as a wheel housing container is shown in figure 4, wherein in this exemplary embodiment a first chamber 3a and a second chamber 3b are divided transversely to the greatest extent of the container body 2.

30 The installed position of the fluid container 1 configured as a wheel housing container is shown, for example, in figure 5.

35 Other variants of the geometric design of the fluid container 1 according to the invention are shown in figures 6 to 10, in which in each case the same components are provided with the same reference numerals.

- 11 -

The fluid container 1 according to figure 6 is configured as rectangular container body 2 in contour, wherein a first chamber 3a fully encloses a second chamber 3b to the side and the chambers are separated
5 from one another by an approximately rectangular stamped portion and/or constriction 5. Figure 6 shows a cross section through the container body 2.

The variant shown in figure 7 of the fluid container 1
10 differs from that which is shown in figure 6 in that the container body 2 has a substantially torus-shaped form, i.e. approximately extends in a circular segment shape, wherein the first chamber 3a concentrically surrounds and/or encloses the second chamber 3b.

15 Such a fluid container 1 may, for example, be arranged in a spare tire recess of a motor vehicle.

In the variant shown in figure 8 of the fluid container
20 1 a first chamber 3a is approximately of L-shaped design, said chamber enclosing a second chamber 3b on two sides, wherein the second chamber 3b and the first chamber 3a as in all previous examples are separated from one another by a constriction 5, which has been
25 achieved by pinching the preform(s) inside the blow-molding tool. A comparable design of a container body 2 with three chambers is shown in figure 9, wherein a first chamber 3a, for example, receives a washer fluid for a windshield washer system, a second, also outer,
30 chamber 3b for example receives a urea solution as an additive for exhaust gas denitrification and a third chamber 3c enclosed by the first and second chambers 3a and 3b at least on three sides receives fuel.

35 A further variant of the fluid container according to the invention is shown in figure 11. The fluid container 1 shown here differs from the above-described fluid containers in that said fluid container is made

up from injection-molded shells 7, which are welded together along a peripheral flange 8. The container body 2 comprises a first outer chamber 3a and a second inner chamber 3b.

5

At this point it should be mentioned again that the filler connectors or filler pipes or possibly provided fittings, etc. for reasons of simplicity are not shown in detail in the figures.

10

The fluid container shown in figure 12 also comprises at least two injection-molded shells 7 which enclose a first and a second chamber 3a, 3b, wherein the first chamber 3a and the second chamber 3b are arranged adjacent to one another. A filler pipe 9 is attached to the first chamber and to the second chamber, said filler pipe comprising two filling channels 10. Each of the filling channels 10 is attached to a chamber 3a, 3b and provided with an orifice connector 11 which has been made as a separate component.

20

The base 12 of the lower shell 7 of the fluid container 1 comprises an additional floor tray 12b as a separate component which is welded to the lower shell 7 by the interposition of a resistance heating element 13, so that the entire fluid container 1 is configured to be able to be heated. Instead of a resistance heating element 13, a heat exchanger pipe 14 laid in a meandering manner with a delivery flow connector 15 and a return flow connector 16 is provided between the base and the floor tray 12b as shown in figure 13. A heat exchanger medium, for example hot water from the cooling circuit of the internal combustion engine, may flow through the heat exchanger pipe 14, for example.

It goes without saying that, instead of one heat exchanger pipe 14, a plurality of heat exchanger pipes may be provided which are connected to form a plurality

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- 13 -

of heating circuits and to which, for example, a heat exchanger medium may be applied in zones.

Alternatively, the floor tray 12b and/or the base 12
5 may be provided with integrally formed channel walls, which form one or more fluid channels.

Alternatively, between the floor tray 12b and the base 12 of the lower shell 7, a free partial volume may be
10 formed, a heat exchanger medium being able to flow through the entire volume thereof.

A variant of an extrusion blow-molded filler pipe 9 for a fluid container 1 according to the invention is
15 shown, for example, in figure 14, wherein the filler pipe 9 comprises two filling channels 10 connected together in one piece, as well as an integrally formed chamber 3 which, for example, may be filled with a windshield washer fluid. The fluid container 1 may, for
20 example, in this case comprise a first chamber for fuel and a second chamber for an additive, wherein the chamber integrally formed on the filler pipe 9 serves as a third chamber for the washer fluid. The filler pipe 9 is produced integrally in the known manner by
25 extrusion blow-molding, wherein the filling channels 10 as well as the chamber 3 are formed in each case by constrictions 5 of the component wall.

A further variant of a filler pipe for a fluid
30 container 1 according to the invention is shown in figure 15, wherein the filler pipe 9 comprises two filling channels 10 and a common ventilation channel 17.

35 Thus, as set forth above, the filling channels 10 and optionally the ventilation channel 17 branches off to form the different chambers of the fluid container 1. For example, a ventilation line for the chamber which

receives a liquid additive and the chamber which receives fuel, may be brought together and diverted via a common ventilation channel 17 of the filler pipe. To this end, for example, the ventilation line may be
5 provided upstream of the inlet in the ventilation channel 17 with a fluid non-return valve, so that media may not be exchanged via the ventilation line. To this end, for example, a floating body may be provided in the relevant ventilation line.

10

Different orifice connectors 11 may be attached to the one-piece line portion of the filler pipe 9, for example. Alternatively, a multipart filler head consisting of a filler head lower part 18 and a filler
15 head upper part 19 may be provided on the filling channels 10.

To this end, the filler head upper part (figure 18) is provided, for example, with receiver openings 20 for a
20 nozzle or for a filling arrangement. The filler head lower part 18 (figures 16 and 17) is provided in each case with two inlet openings 21 and two outlet openings 22, wherein the outlet openings 22 are attached to the filling channels 10. The filler head lower part 18 and
25 the filler head upper part 19 are expediently welded so that in each case a continuous outlet channel is formed from the receiver opening 20 to the outlet opening 22. The filler head lower part 18 shown in figure 16 has been obtained by injection-molding, but the filler head
30 lower part 18 shown in figure 17 has been obtained by blow-molding.

The filler head upper part 19, shown in figure 18, has been obtained by injection-molding.

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It is possible for the filling channels 10 of the filler pipe 9 to have been retrospectively attached to the outlet openings 22 of the filling body lower part

- 15 -

18, alternatively it is possible to insert the preassembled filler head in a blow-molding tool and integrally mold the filler pipe 9.

- 5 Finally, a closure arrangement 23 for the filler head upper part 19 shown in figure 18 is shown in figure 19. An arrangement of the fluid container 1 as a saddle tank is shown, for example, in figure 20 with a filler pipe 9 arranged thereon.

10

List of reference numerals

	1	Fluid container
	2	Container body
5	3	Chamber
	3a	First chamber
	3b	Second chamber
	3c	Third chamber
	4	Container wall
10	5	Constrictions
	6	Free space
	7	Shells
	8	Flange
	9	Filler pipe
15	10	Filling channel
	11	Orifice connector
	12	Base
	12b	Floor tray
	13	Resistance heating element
20	14	Heat exchanger pipe
	15	Delivery flow connector
	16	Return flow connector
	17	Ventilation channel
	18	Filler pipe lower part
25	19	Filler pipe upper part
	20	Receiver opening
	21	Inlet opening
	22	Outlet opening

Claims

1. A variable fluid container (1) made of thermoplastic material for a motor vehicle,
5 comprising at least two chambers (3a, 3b, 3c) separated from one another and not directly communicating with one another for receiving different fluids, wherein the fluid container (1) is configured in one piece.
- 10 2. The variable fluid container as claimed in claim 1, characterized in that each of at least two chambers (3a, 3b, 3c) is arranged completely outside the respective other chamber (3a, 3b, 3c).
- 15 3. The variable fluid container as claimed in claim 1 or 2, characterized in that at least two chambers (3a, 3b, 3c) are arranged adjacent to one another for receiving different fluids.
- 20 4. The variable fluid container as claimed in one of claims 1 to 3, characterized in that at least two chambers (3a, 3b, 3c) adjoin one another via at least one common partition.
- 25 5. The variable fluid container as claimed in one of claims 1 to 4, characterized in that at least two chambers (3a, 3b, 3c) are formed by at least one stamped portion or by pulling in or pushing in at
30 least one common container wall (4).
6. The variable fluid container as claimed in one of claims 1 to 5, characterized in that at least one chamber (3a, 3b, 3c) is arranged between at least
35 two further chambers (3a, 3b, 3c).
7. The variable fluid container as claimed in one of claims 1 to 5, characterized in that at least one

chamber (3a, 3b, 3c) at least partially encloses at least one further chamber (3a, 3b, 3c), preferably over a lateral periphery of at least 50% in the installed position.

- 5
8. The variable fluid container as claimed in one of claims 1 to 7, characterized in that at least one chamber (3a, 3b, 3c) may be heated.
- 10 9. The variable fluid container as claimed in one of claims 1 to 8, characterized in that said fluid container comprises at least one container body (2) configured to be partially double-walled, which encloses at least one partial volume, which
- 15 is provided with at least one delivery flow connector and return flow connector (15, 16) for a heat exchanger volume.
- 20 10. The variable fluid container as claimed in one of claims 1 to 9, characterized in that a double-walled region of the container body (2) is adjacent to a plurality of chambers (3a, 3b, 3c) so that a plurality of chambers (3a, 3b, 3c) may be temperature-controlled at the same time.
- 25 11. The variable fluid container as claimed in one of claims 1 to 10, characterized in that said fluid container comprises at least one filler pipe (9), which comprises a plurality of channels separate
- 30 from one another as filling and/or ventilation channels, wherein the channels are connected together in one piece at least via a longitudinal portion of the filler pipe (9) and are branched into a plurality of chambers (3a, 3b, 3c).
- 35 12. The variable fluid container as claimed in claim 11, characterized in that the filler pipe (9) comprises at least one filler connector or filler

head, which comprises at least two separate orifice guides and/or orifice connectors for a nozzle or a filling arrangement, wherein the filler head is preferably attached to the filler pipe (9) as a separate component.

13. The variable fluid container as claimed in one of claims 1 to 6 or 8 to 12, characterized in that the container body (2) is configured as a saddle tank and in the installed position extends inside the motor vehicle partially above and partially adjacent to an exhaust gas system of the motor vehicle.

14. The variable fluid container as claimed in one of claims 1 to 12, characterized in that said fluid container is configured as a wheel housing container and extends in the installed position in the motor vehicle inside a wheel housing.

15. The variable fluid container as claimed in one of claims 1 to 12, characterized in that said fluid container is arranged in the installed position in the motor vehicle inside the engine compartment directly below the windshield of the motor vehicle.

16. A method for producing a variable fluid container (1) as claimed in one of claims 1 to 15, wherein the method comprises the following: at least the container body (2) is produced in one piece by extrusion blow-molding of at least one tubular or web-like extrudate made of thermoplastic material, wherein at least two chambers (3a, 3b, 3c) are formed by wall-to-wall welding of the preform in a blow-molding tool.

17. The method for producing a variable fluid container (1) as claimed in one of claims 1 to 15, comprising the injection molding of thermoplastic material to form at least two shell-shaped semi-finished products and the welding of the semi-finished products to form a substantially closed container body (2), forming separate chambers (3a, 3b, 3c) which are sealed relative to one another.

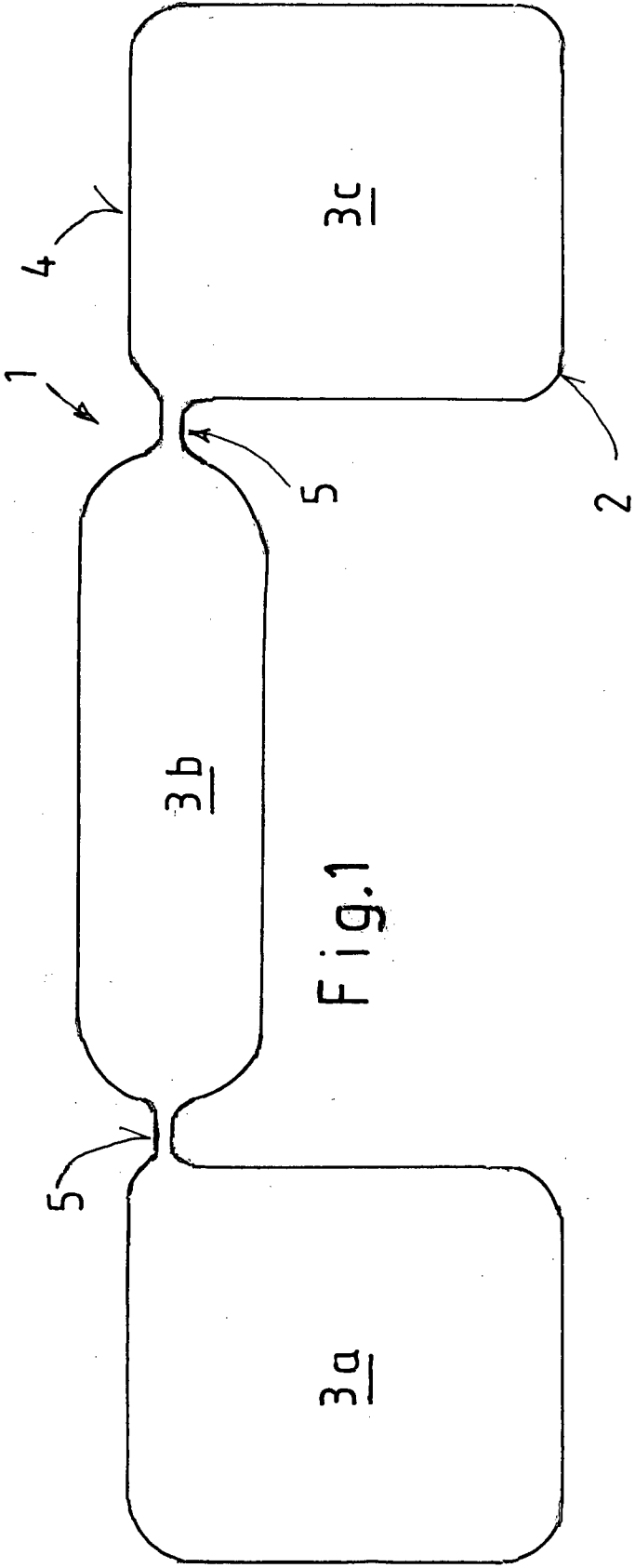


Fig.1

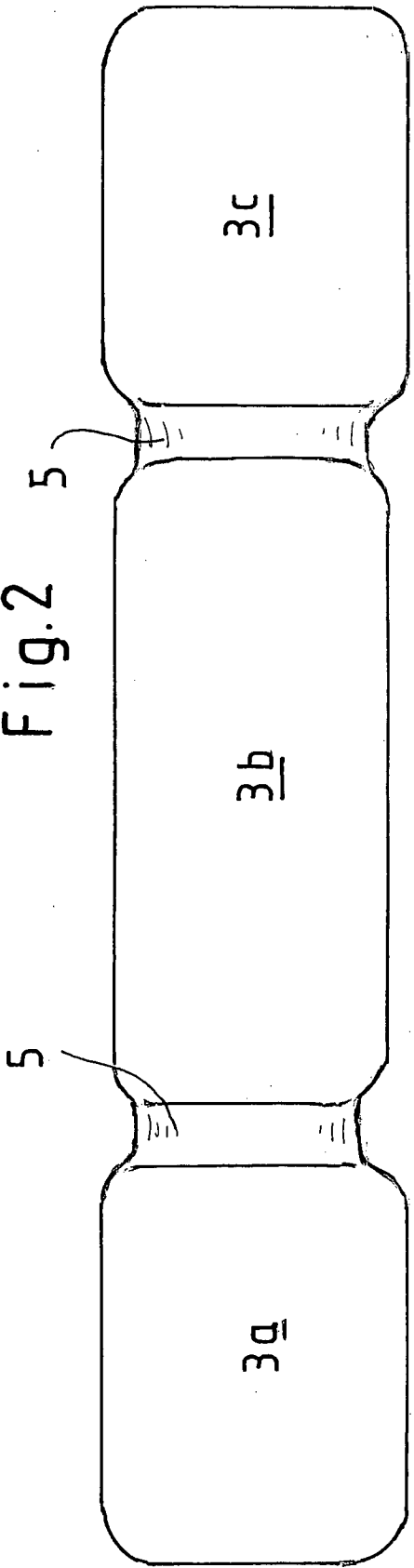
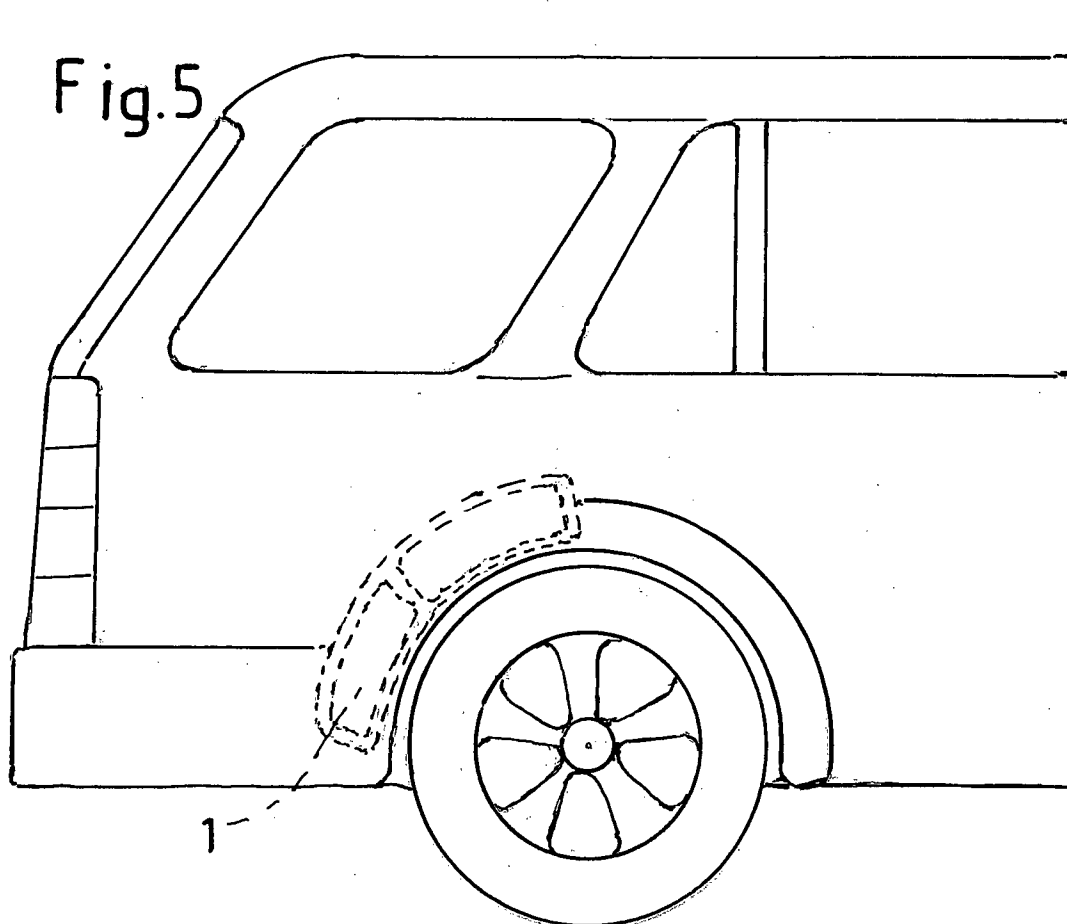
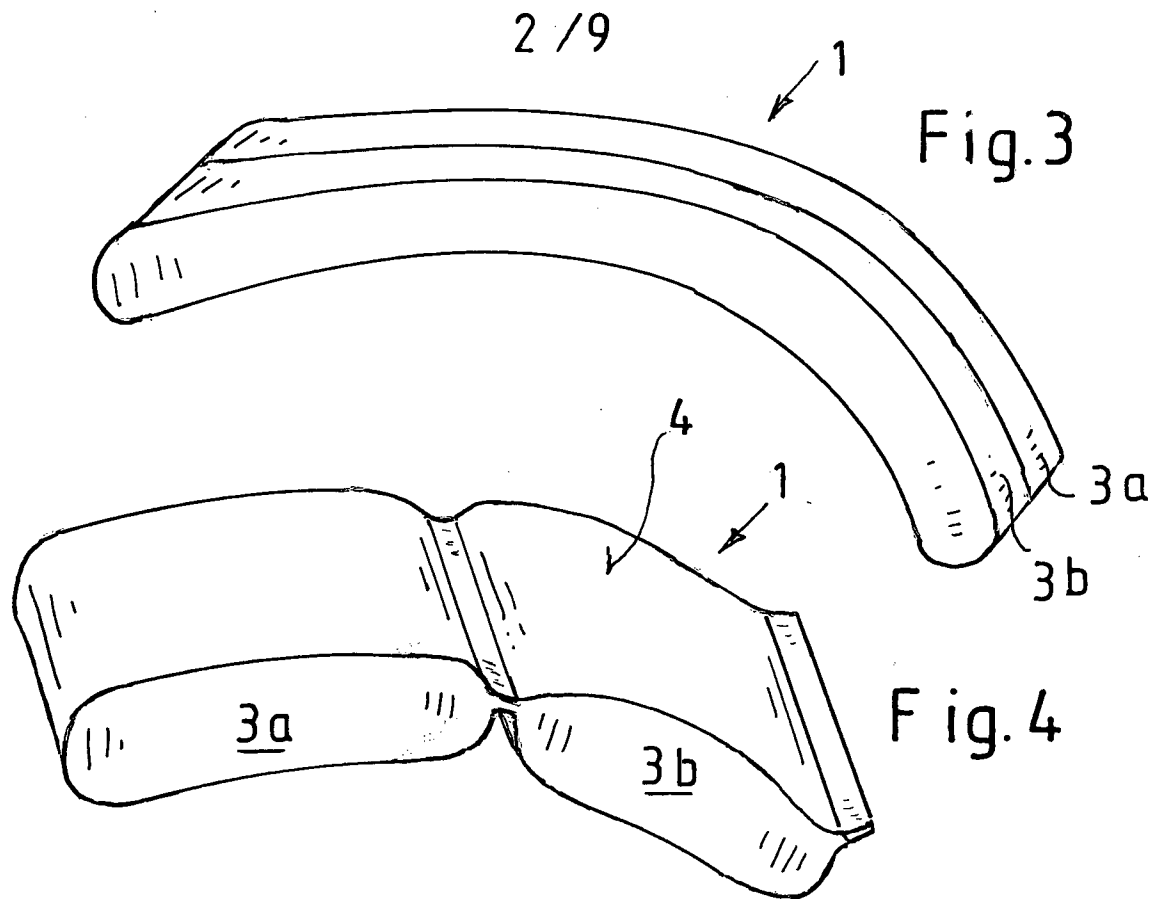
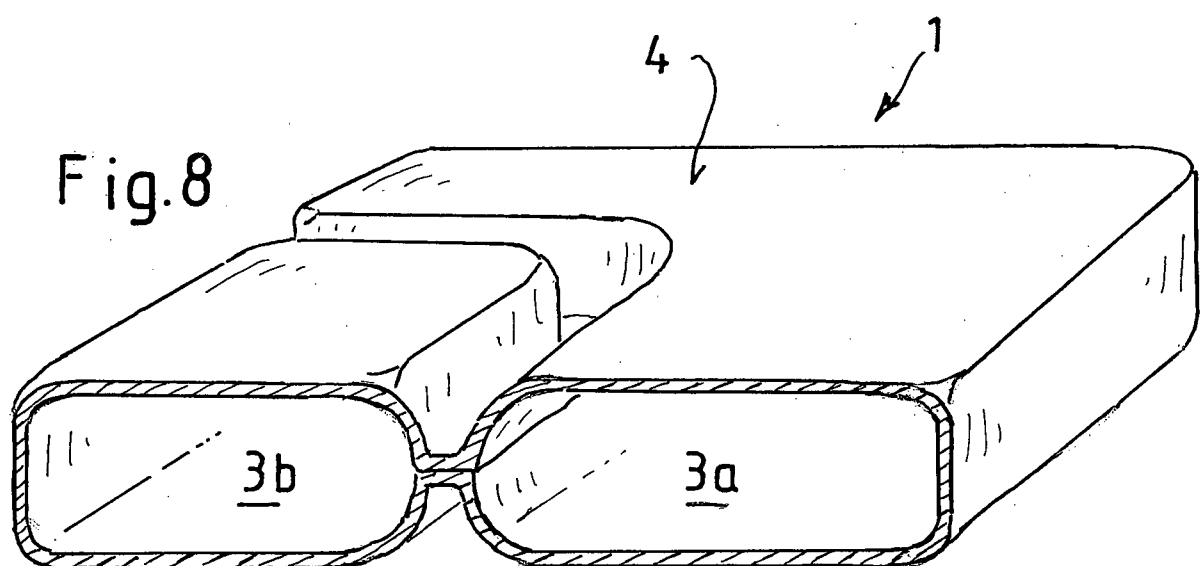
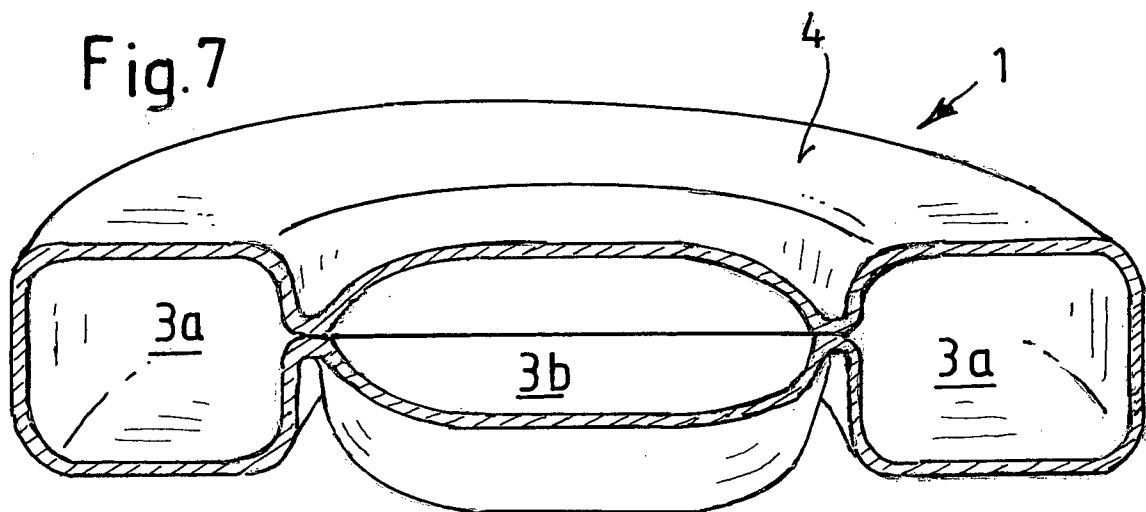
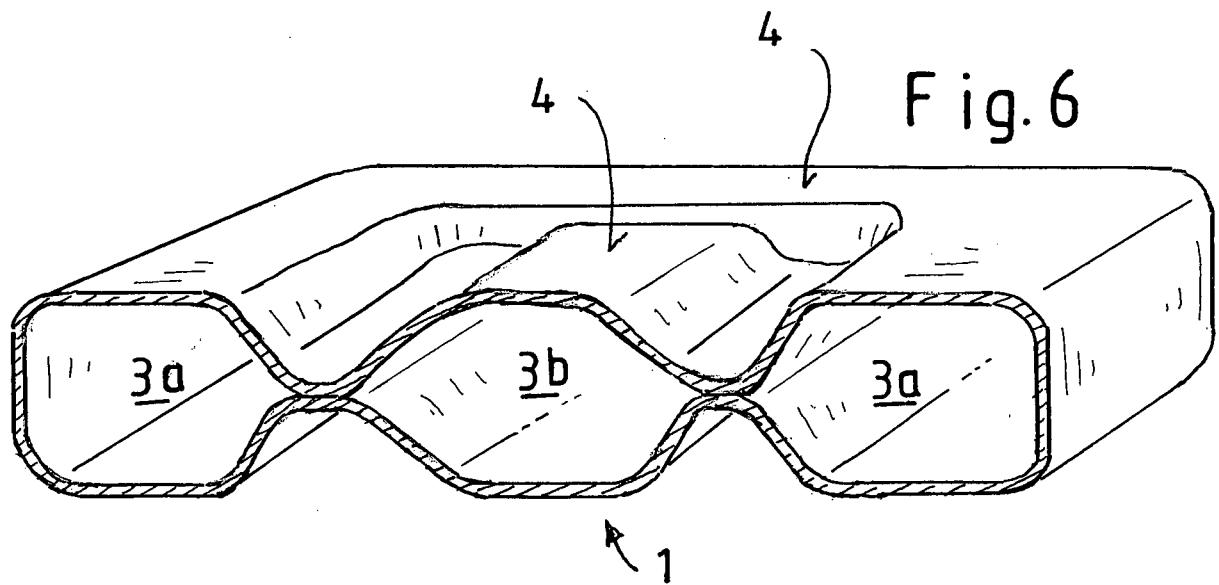


Fig.2



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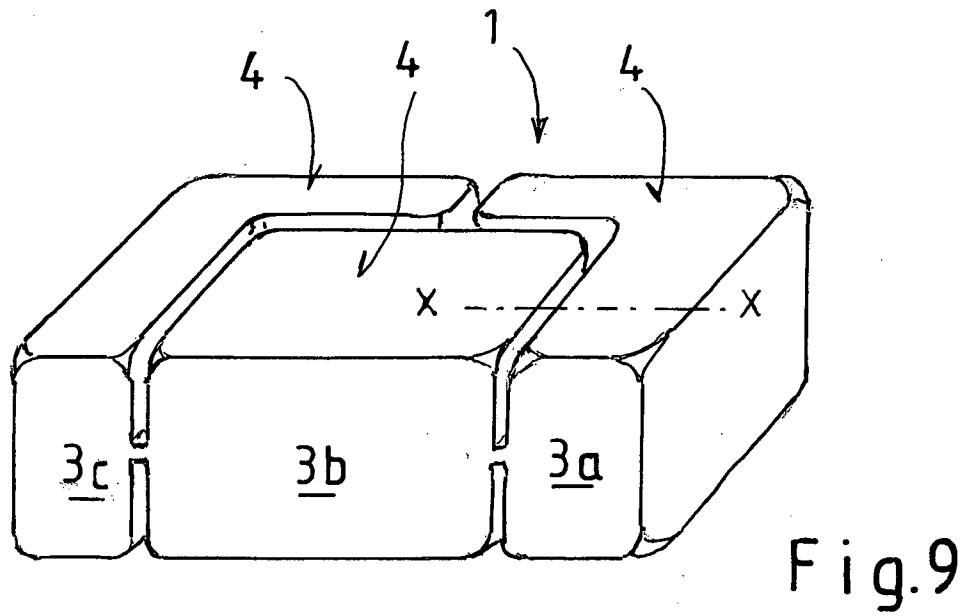
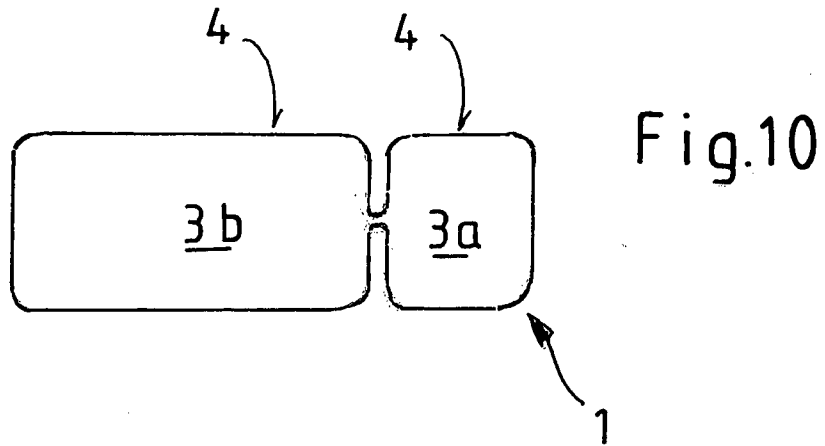


Fig.11

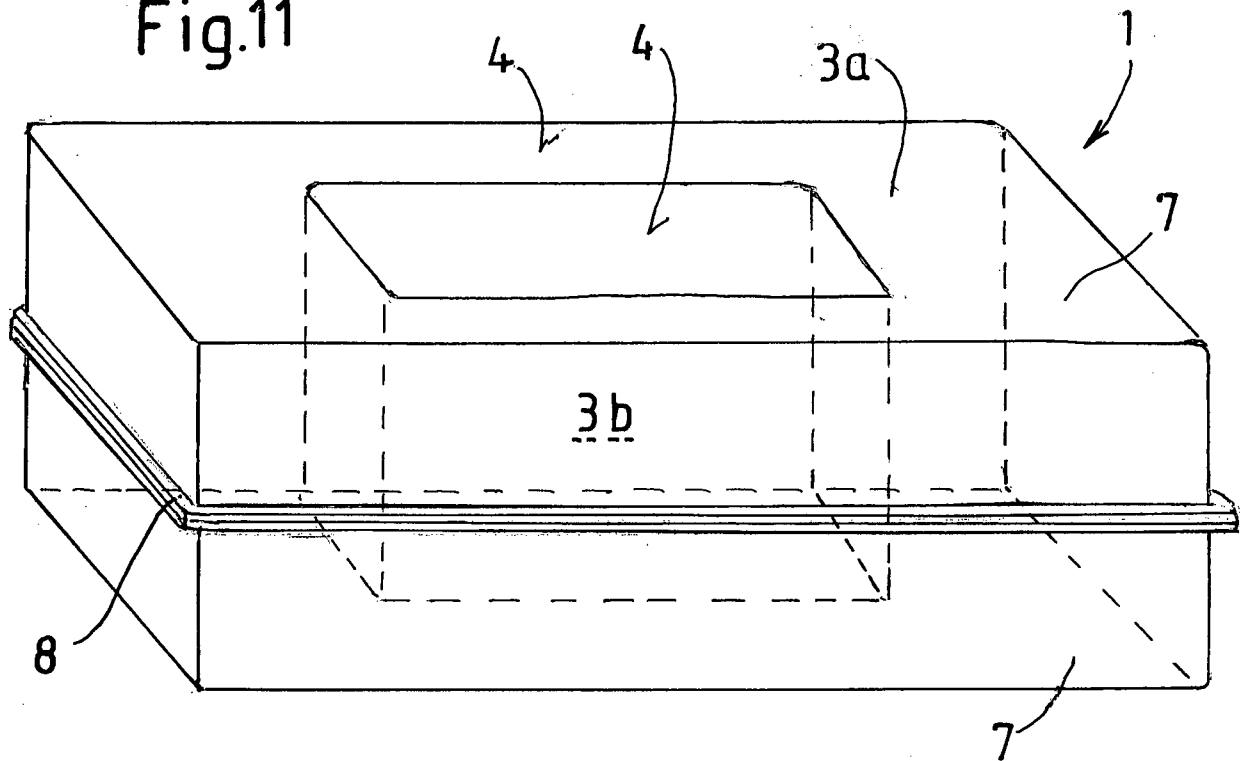
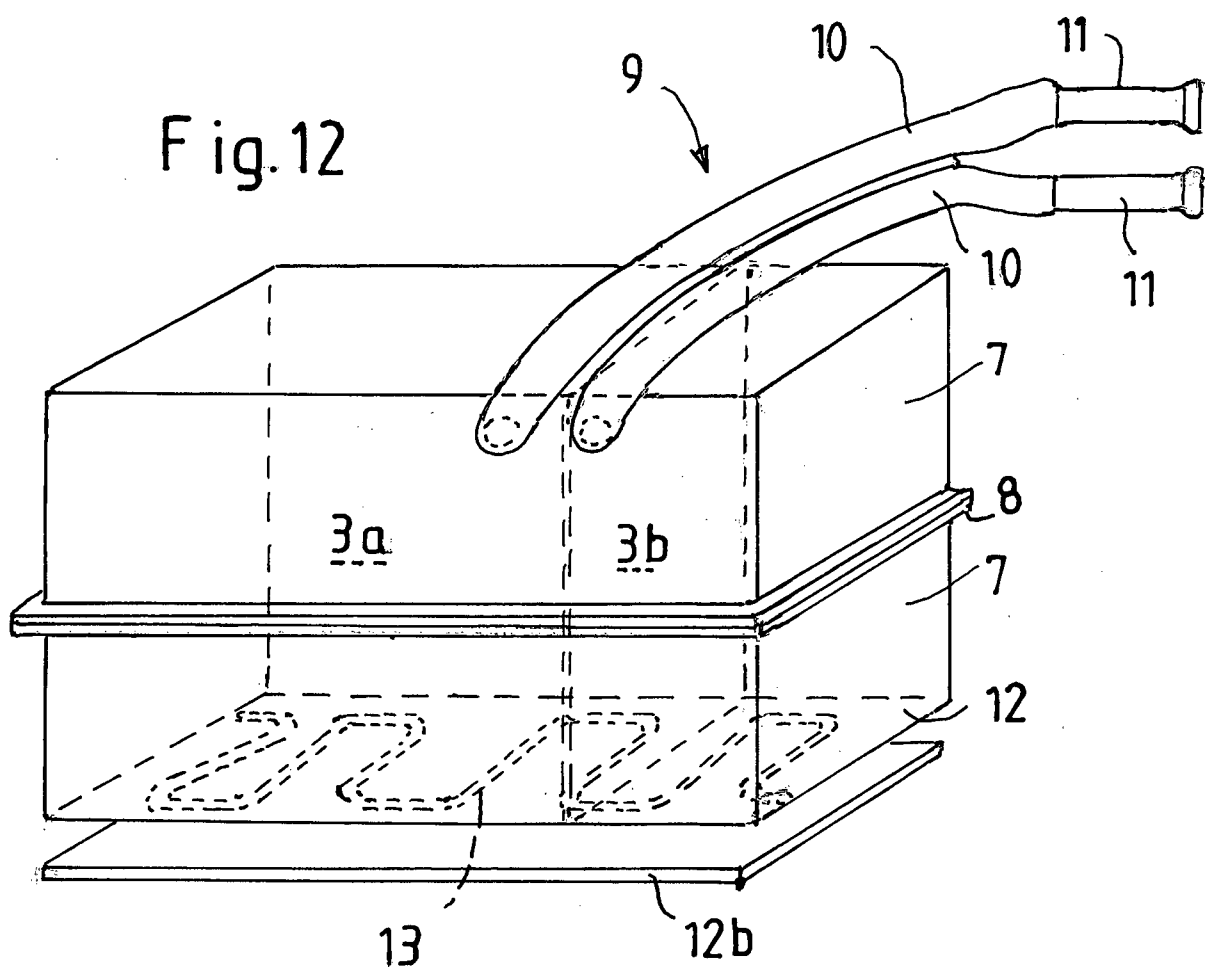
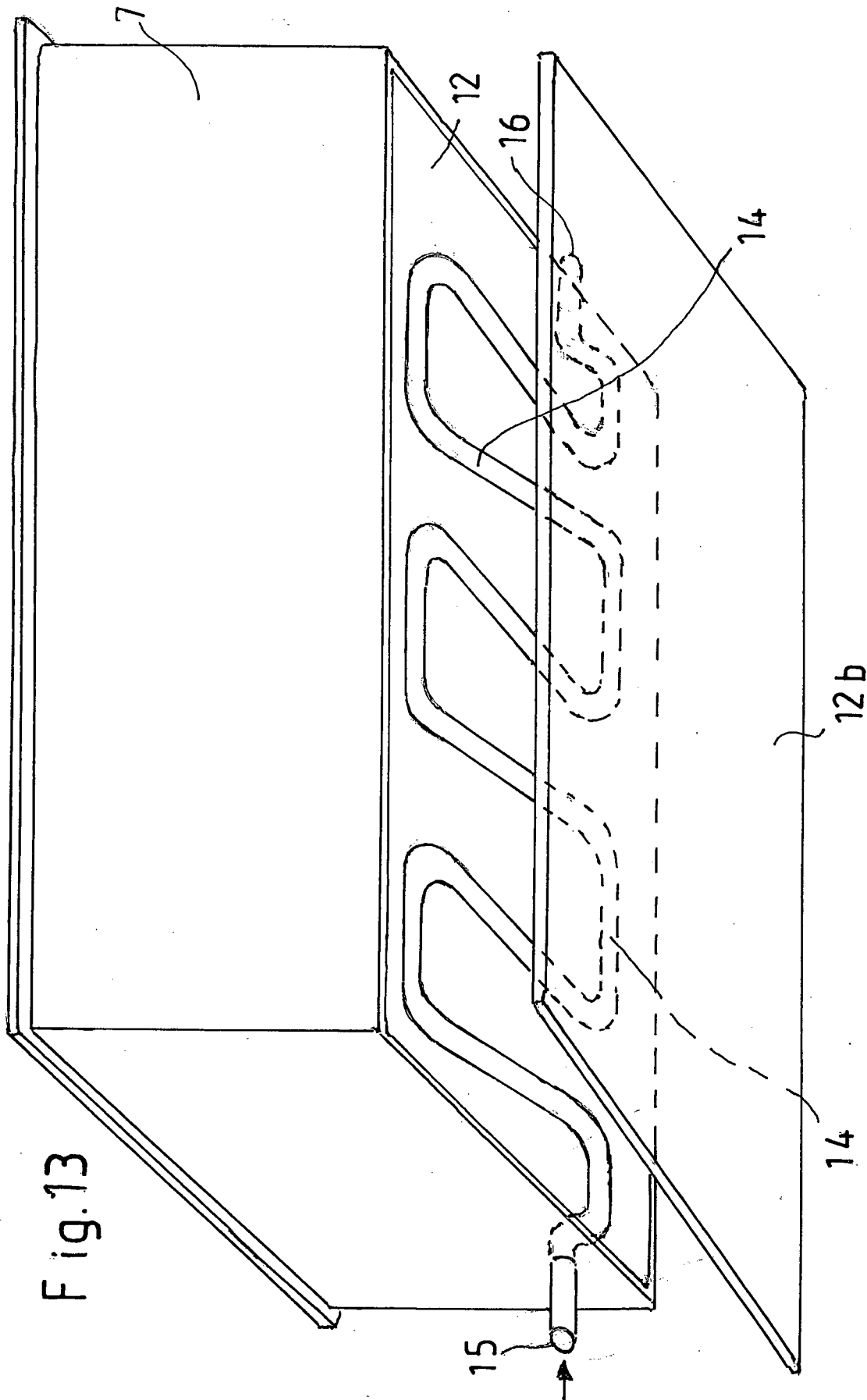


Fig. 12



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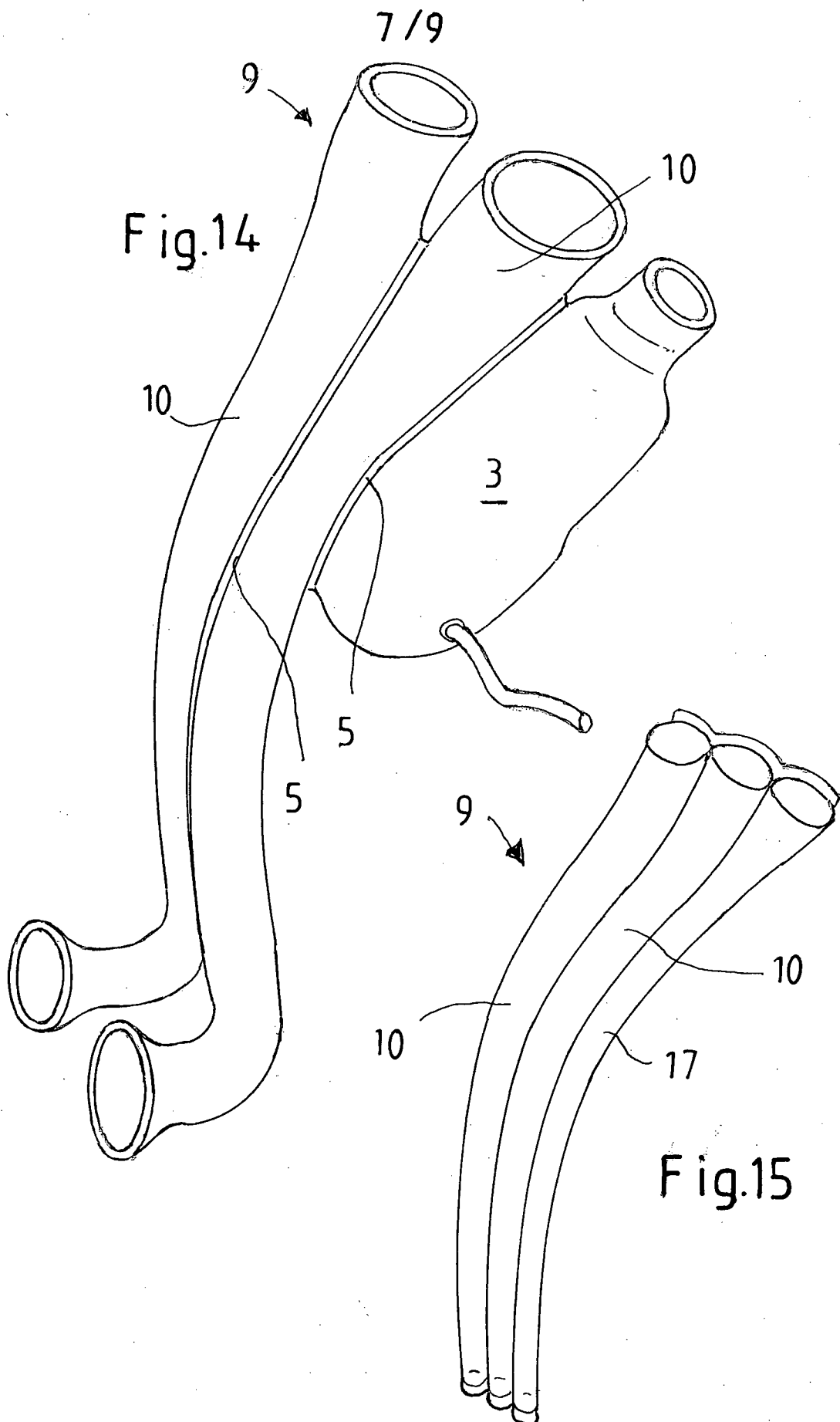
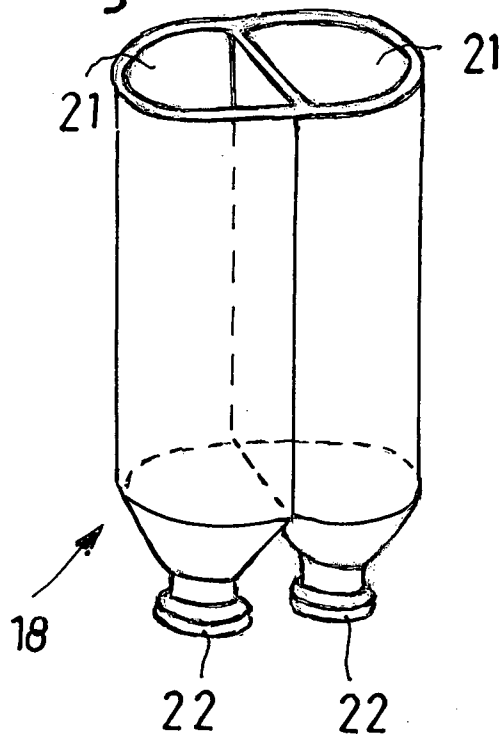


Fig.16



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Fig.17

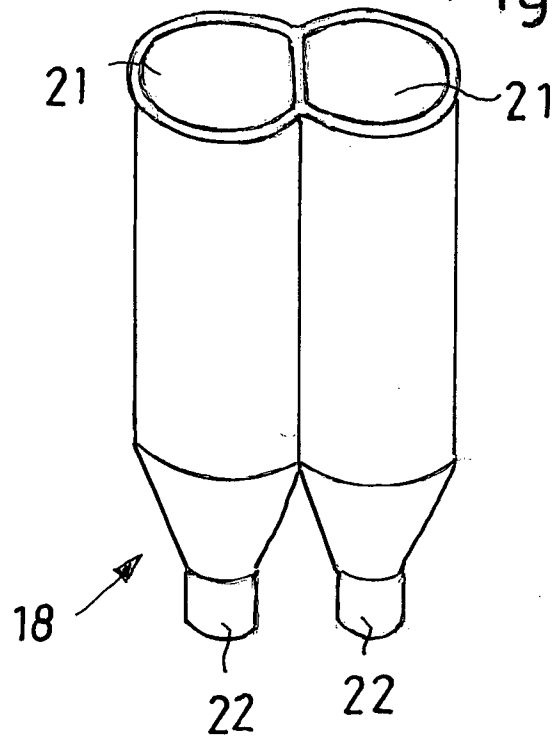
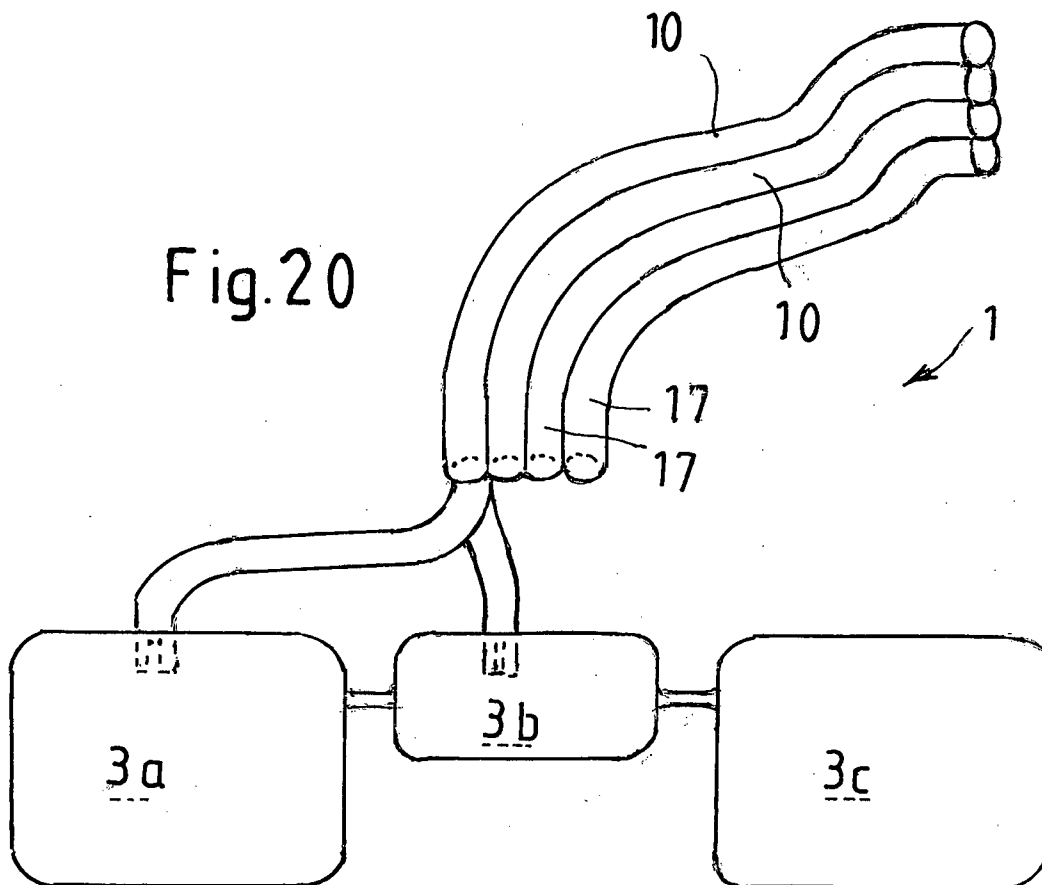
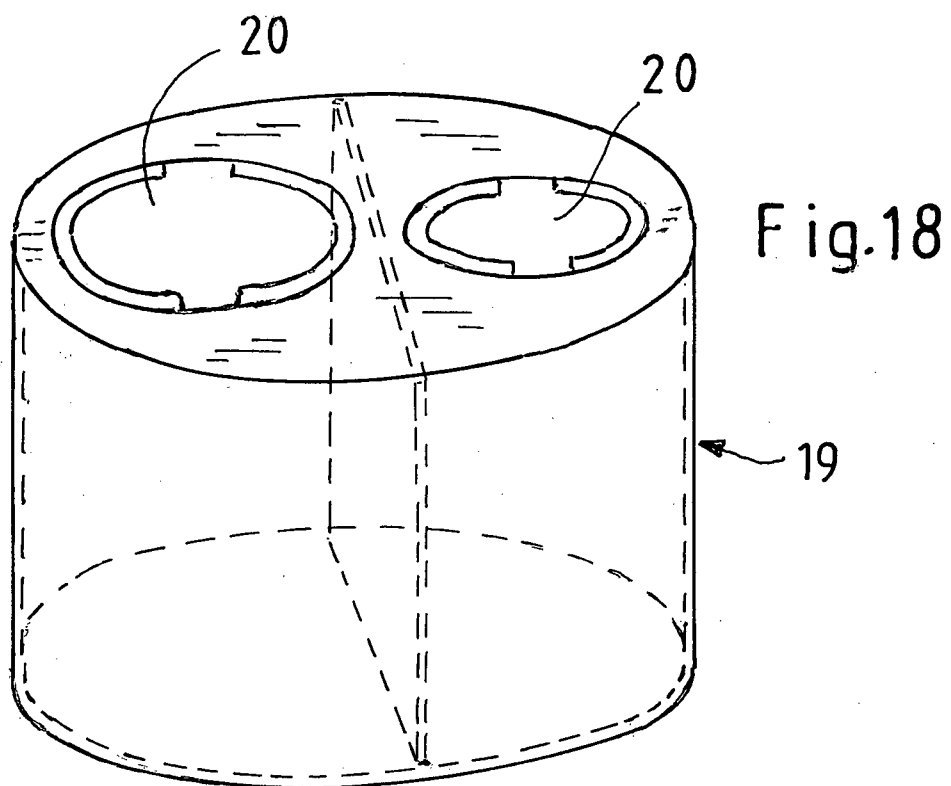
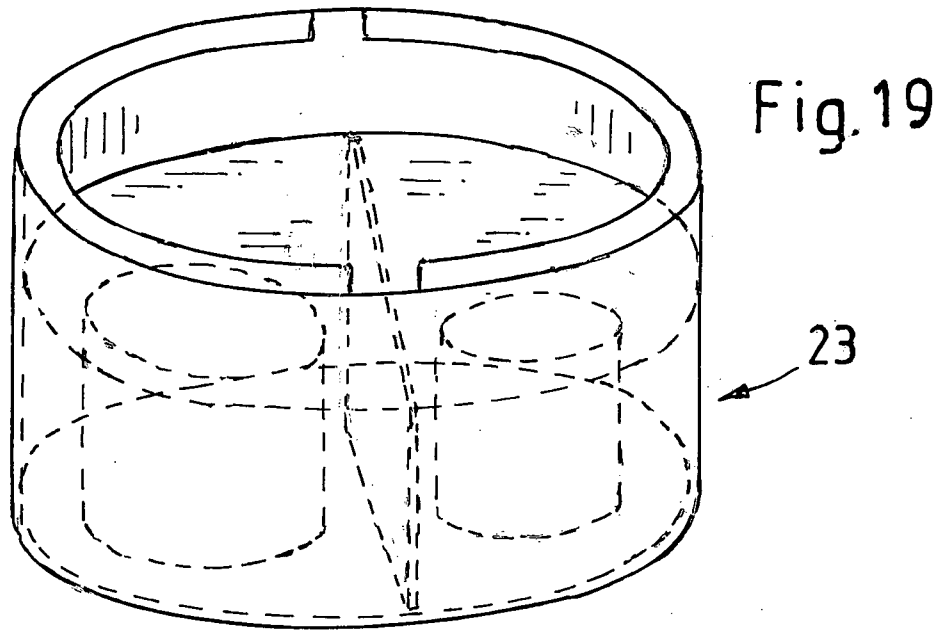


Fig.20



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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2013/000758

A. CLASSIFICATION OF SUBJECT MATTER
INV. B60K15/03177
ADD. B60K15/03

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

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	DE 10 2009 009676 A1 (DAIMLER AG [DE]) 26 August 2010 (2010-08-26) the whole document	1-3,5,8, 11,12, 16,17
X	US 2009/103838 A1 (FONKALSRUD ANDREW O [FR] ET AL) 23 April 2009 (2009-04-23) paragraphs [0031], [0033]; figures 5,6	1-4,6-8
A	DE 103 23 072 A1 (DAIMLER CHRYSLER AG [DE]) 30 December 2004 (2004-12-30) abstract; figure 3	1
A	WO 2009/131561 A1 (MACK TRUCKS [US]; TAM DENNIS [US]; STOUT MICHAEL B [US]) 29 October 2009 (2009-10-29) abstract; figure 1	1
	-/-	



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

18 June 2013

Date of mailing of the international search report

01/07/2013

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

Authorized officer

Eriksson, Jonas

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2013/000758

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 101 12 353 A1 (VOLKSWAGEN AG [DE]) 27 September 2001 (2001-09-27) abstract; figure 2 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2013/000758

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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