



(51) International Patent Classification:

B60R 16/00 (2006.01) **B62D 33/073** (2006.01)
B60S 1/50 (2006.01)

(21) International Application Number:

PCT/SE2013/051232

(22) International Filing Date:

23 October 2013 (23.10.2013)

(25) Filing Language:

Swedish

(26) Publication Language:

English

(30) Priority Data:

1251243-0 1 November 2012 (01.11.2012) SE

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(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, 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).

Published:

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

(54) Title: MOTOR VEHICLES

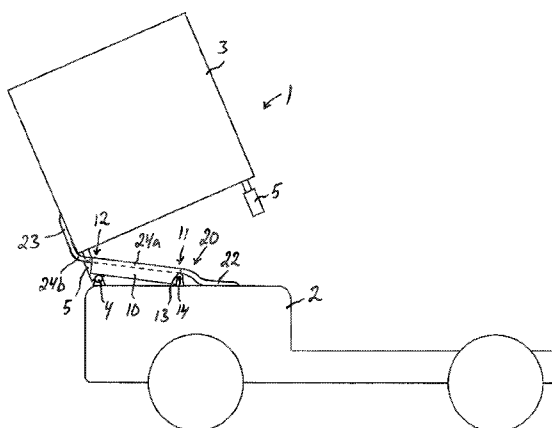


Fig 6

(57) Abstract: Motor vehicle comprising : - a cabin unit (3) which via a joint (4) is articulated to a vehicle frame (2) and tiltable in relation to the vehicle frame, - a liquid container (10) fitted on the vehicle frame turned toward the cabin unit, and - an elongated conduit bundle (20) having a first section (22) which is fitted on the vehicle frame, a second section (23) which is fitted on the cabin unit, and a third section (24) which is fitted between the above-mentioned first and second sections. The liquid container is articulated to the vehicle frame via a joint (13) located at the first end (11) of the liquid container in order to permit the opposite second end (12) of the liquid container to turn in a vertical direction in relation to the vehicle frame when the cabin unit is tilted in relation to the vehicle frame. The said third section of the conduit bundle has a first section (24a) which is fixed to the liquid container and which extends between the said first and second ends of this, and an adjacent second section (24b) which extends between the said second end of the liquid container and the cabin unit.



Motor vehicles

5 FIELD OF THE INVENTION AND PRIOR ART

The present invention relates to a motor vehicle according to the preamble of patent claim 1.

- 10 In certain heavier motor vehicles, such as certain types of towing vehicles and trucks, the motor vehicle's operating space is arranged in a cabin unit, which is articulated to the motor vehicle's vehicle frame and tiltable in relation to the vehicle frame backwards and forwards between a lowered position and a
- 15 raised position. The cabin unit is normally in the lowered position and may be tilted forwards to the raised position so that the engine compartment below the cabin unit is available for service or repairs. In a motor vehicle with a tiltable cabin unit, certain devices on the vehicle's frame are connected to associated
- 20 devices in the cabin unit via flexible conduits in the form of e.g. cables and pipes which are gathered in a joint conduit bundle. This conduit bundle is fixed, at a first fixation point, to the vehicle frame and at a second fixation point to the cabin unit, and the conduit bundle between these points of fixation includes one
- 25 section which is loosely arranged in order not to adversely affect the cabin unit's ability to be tilted. In order to avoid damage to the conduit bundle and its attachments, the loose section of the conduit bundle which extends between the mentioned first and second points of fixation, i.e. between the vehicle frame and the

cabin unit, must be sufficiently long so that it is not exposed to excessive tensile stress when the cabin unit is tilted forwards from the lowered position to the raised position. This means that the loose section of the conduit bundle is relatively long and bulky. In addition, space is required around the loose section of the conduit bundle in order to ensure that this section of the conduit bundle is freely movable in connection with the tilting of the cabin unit. This loose section of the conduit bundle therefore occupies a relatively large space in the motor vehicle in the area between the vehicle frame and the cabin unit, which means there is less space for other vehicle components which may need to be placed in the area between the vehicle frame and the cabin unit. In connection with its suspension movements in relation to the vehicle frame, the cabin unit is also at risk of knocking into the loose and relatively bulky section of the conduit bundle which is located in the area between the vehicle frame and the cabin unit, thus producing a more rigid suspension and impaired cabin comfort.

20 OBJECTIVE OF THE INVENTION

The objective of the present invention is to achieve a solution to the above-mentioned problem, i.e. a bulky conduit bundle between the vehicle frame and the cabin unit in a motor vehicle with a tiltable cabin unit.

SUMMARY OF THE INVENTION

According to the present invention, the above-mentioned objective is achieved with the help of a motor vehicle having the characteristics defined in patent claim 1.

The motor vehicle according to the invention comprises:

- a vehicle frame,
- a cabin unit which comprises a driver's seat and which is articulated to the motor vehicle frame via a joint and tiltable in relation to the vehicle frame backwards and forwards between a lowered position and a raised position,
- a liquid container which is fitted on the vehicle frame turned toward the cabin unit, where such liquid container has a first end turned away from the said joint and an opposite second end, and
- an elongated conduit bundle consisting of a number of flexible conduits, such conduit bundle having a first section which is fitted on the vehicle frame, a second section which is fitted on the cabin unit, and a third section which is fitted between the above-mentioned first and second sections.

The liquid container is articulated to the vehicle frame via a joint located at the said first end of the liquid container in order to permit the opposite second end of the liquid container to turn in a vertical direction in relation to the vehicle frame when the cabin unit is tilted in relation to the vehicle frame. The said third section of the conduit bundle has a first section which is fixed to the liquid container and which extends between the said first and second ends of this, and an adjacent second section which extends between the said second end of the liquid container and the cabin unit.

In the cabin unit's lowered position, the liquid container is lowered toward the vehicle frame and when the cabin unit is tilted from its lowered position to its raised position, the loose
5 section of the conduit bundle between the second end of the liquid container and the cabin unit is extended and pulls the above-mentioned second end of the liquid container with it in an upward turning direction. When the cabin unit is then returned into its lowered position, this loose section of the conduit bundle
10 slacks, causing the liquid container, by virtue of gravitation, to turn back into the lowered position. With the arrangement according to the invention, the loose section of the conduit bundle between the vehicle frame and the cabin unit may be shortened compared to the conventional arrangement described
15 above. This entails that the conduit bundle takes up less space in the area between the vehicle frame and the cabin unit, which in its turn entails increased space for other vehicle components in this area and a possibility of avoiding that the cabin unit knocks into the conduit bundle in connection with suspension movements
20 between the cabin unit and the vehicle frame and thus improved cabin comfort.

According to one embodiment of the invention, the said first section is received in an elongated groove which is arranged in
25 or on top of the liquid container and which extends between the said first and second ends of the same container. The section of the conduit bundle which runs along the liquid container is arranged to be protected inside this groove, which entails a reduced risk of damage on this section of the conduit bundle.

According to another embodiment of the invention, the said groove is integrated into the liquid container and preferably designed as an external recess in the liquid container. Thus, the need to fit a separate groove on the liquid container is avoided while the groove may be designed to take up less space.

Other favourable characteristics of the motor vehicle according to the invention are set out in the non-independent patent claims and the description below.

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BRIEF DESCRIPTION OF DRAWINGS

The invention is described below with the help of example embodiments, with reference to the enclosed drawings. Exhibited in:

15

Fig 1 a schematic side view of a motor vehicle, according to one embodiment of the present invention, with a tiltable cabin unit showed in a lowered position,

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Fig 2 a schematic side view of a part of the motor vehicle, according to Fig 1, with the cabin unit showed in a raised position,

25

Fig 3 a schematic side view of a liquid container in a motor vehicle, according to Fig 1,

Fig 4 a section according to the line IV-IV in Fig 3,

- Fig 5 a diagram of parts included in the motor vehicle, according to Fig 1, with the motor vehicle's cabin unit showed in a lowered position, and
- 5 Fig 6 a diagram similar to Fig 5, but with the motor vehicle's cabin unit showed in a raised position.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

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In Fig 1, 2, 5 and 6 a motor vehicle 1 is illustrated according to one embodiment of the present invention. In this case the motor vehicle is a towing vehicle. The motor vehicle 1 comprises a vehicle frame 2 and a cabin unit 3 with a driver's seat. The cabin unit 3 is connected via a joint 4 to the vehicle frame 2 and tiltable in relation to the vehicle frame backwards and forwards between a lowered position (see Fig 1 and 5) and a raised position (see Fig 2 and 6). The said joint 4 is located at the front end of the cabin unit 3. When the vehicle is driven, etc., the cabin unit 3 is normally in the lowered position and may be tilted forwards to the raised position so that the engine compartment below the cabin unit is made available for service or repair. In the lowered position the cabin unit 3 is carried by the vehicle frame 2 in a conventional manner with suspension elements 5 which are arranged between the vehicle frame and the cabin unit and illustrated in a very schematic way in Fig 5 and 6.

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The motor vehicle 1 is equipped with a liquid container 10 which is fitted on the vehicle frame 2 turned toward the cabin unit 3.

30 This liquid container 10 is thus arranged in the space 6 between

the vehicle frame 2 and the cabin unit 3. The liquid container 10 has a first end 11 which is turned away from the joint 4 between the vehicle frame 2 and the cabin unit 3 and an opposite end 12 which is located in the vicinity of the said joint 4. The liquid
5 container 10 is articulated to the vehicle frame 2 via a joint 13 located at the said first end 11 of the liquid container in order to permit the opposite second end 12 of the liquid container to turn in a vertical direction in relation to the vehicle frame 2 when the cabin unit 3 is tilted in relation to the vehicle frame. The joint 13
10 defines a horizontal pivot 14 for the liquid container 10, so that the liquid container may be turned in relation to the vehicle frame 2 by turning around this pivot 14.

The liquid container 10 may, for example, be a windscreen
15 washer fluid container, a coolant container or an oil container. The liquid container 10 is suitably made of a plastic material but could alternatively be made of metal.

The motor vehicle 1 also comprises an elongated conduit bundle
20 consisting of a number of flexible conduits 21 (see Fig 4), each extending between the vehicle frame 2 and the cabin unit 3. As illustrated in Fig 5 and 6, this conduit bundle 20 has a first section 22 which is fitted on the vehicle frame 2, a second section 23 which is fitted on the cabin unit 3, and a third section
25 24 arranged between the said first and second sections 22, 23 and which extends between the vehicle frame 2 and the cabin unit 3. The said third section 24 of the conduit bundle 20 has a first section 24a which is fixed to the liquid container 10 and which extends between the said first and second ends 11, 12 of
30 the liquid container, and an adjacent second section 24b which

extends between the said second end 12 of the liquid container and the cabin unit 3. The said first section 24a is preferably fitted on the outside of the liquid container 10 and may be fixed to the liquid container 10 with the help of suitable fitting elements (not
5 displayed). The first section 24a could alternatively be fitted in a channel extending through the liquid container 10 inside this between the first and second ends 11, 12 of the liquid container.

In the illustrated embodiment, the said first section 24a runs into
10 an elongated groove 15 which is arranged in the liquid container 10 and extends between the said first and second ends 11, 12 of this container. In the illustrated example the groove 15 is integrated with the liquid container 10 and designed as an external recess in the liquid container's upper side 16. As an
15 alternative, the groove 15 could be designed as a separate part fixed on the liquid container 10, for example on the liquid container's upper side. In the latter case, the groove 15 may be fixed on the liquid container 10 with e.g. bonded, welded or bolted joints.

20

The conduit bundle 20 may, for example, comprise conduits 21 of one or several of the following types: power cable, signal cable, washer fluid pipe, pneumatic cable, hydraulic cable and fuel pipe.

25 When the cabin unit 3 is in the lowered position, the liquid container 10 is also in a lowered position, as illustrated in Fig 1 and 5. The loose part of the conduit bundle 10 extending between the liquid container's second end 12 and the cabin unit 3, i.e. the above-mentioned section 24b, is in a flaccid state
30 when the cabin unit 3 is in the lowered position. When the cabin

unit 3 is tilted from its lowered position to its raised position, the loose section 24b of the conduit bundle extending between the liquid container's second end 12 and the cabin unit 3 is extended and exerts an upward tensile force on the second end 12 of the liquid container. Under the action of the pulling force from the conduit bundle 20, the liquid container 10 turns around the pivot 14 from the lowered position showed in Fig 1 and 5 to the raised position showed in Fig 2 and 6. The part of the conduit bundle 20 which is fixed to the liquid container 10, i.e. the above-mentioned section 24a, moves with the liquid container 10 in a turning movement around the pivot 14 and is thus turned at an upward angle when the cabin unit 3 is tilted from its lowered position to its raised position. When the cabin unit 3 is then returned to its lowered position, the loose section 24b of the conduit bundle becomes flaccid, and the said pulling force on the liquid container 10 ceases, so that the liquid container is free to return back from the raised position to the lowered position under the action of gravity.

The motor vehicle according to the invention is preferably a heavy motor vehicle, such as a towing vehicle or a truck.

The invention is not limited in any way to the embodiments described above, but numerous possible modifications thereof should be obvious to a person skilled in the area, without such person departing from the spirit of the invention as defined by the appended patent claims.

PATENT CLAIMS

1. Motor vehicle comprising:

- a vehicle frame (2),
- 5 - a cabin unit (3) which comprises a driver's seat and which is articulated to the vehicle frame (2) via a joint (4) and tiltable in relation to the vehicle frame backwards and forwards between a lowered position and a raised position,
- a liquid container (10) which is fitted on the vehicle frame (2)
- 10 turned toward the cabin unit (3), where such liquid container (10) has a first end (11) turned away from the said joint (4) and an opposite second end (12), and
- an elongated conduit bundle (20) consisting of a number of flexible conduits (21), such conduit bundle (20) having a first
- 15 section (22) which is fitted on the vehicle frame (2), a second section (23) which is fitted on the cabin unit (3), and a third section (24) which is fitted between the above-mentioned first and second sections (22, 23),

characterised in:

- 20 - that the liquid container (10) is articulated to the vehicle frame (2) via a joint (13) located at the said first end (11) of the liquid container in order to permit the opposite second end (12) of the liquid container to turn in a vertical direction in relation to the vehicle frame (2) when the cabin unit (3) is
- 25 tilted in relation to the vehicle frame, and
- the fact that the said third section (24) of the conduit bundle (20) has a first section (24a) which is fixed to the liquid container (10) and which extends between the said first and second ends (11, 12) of this, and an adjacent second section

(24b) which extends between the said second end (12) of the liquid container and the cabin unit (3).

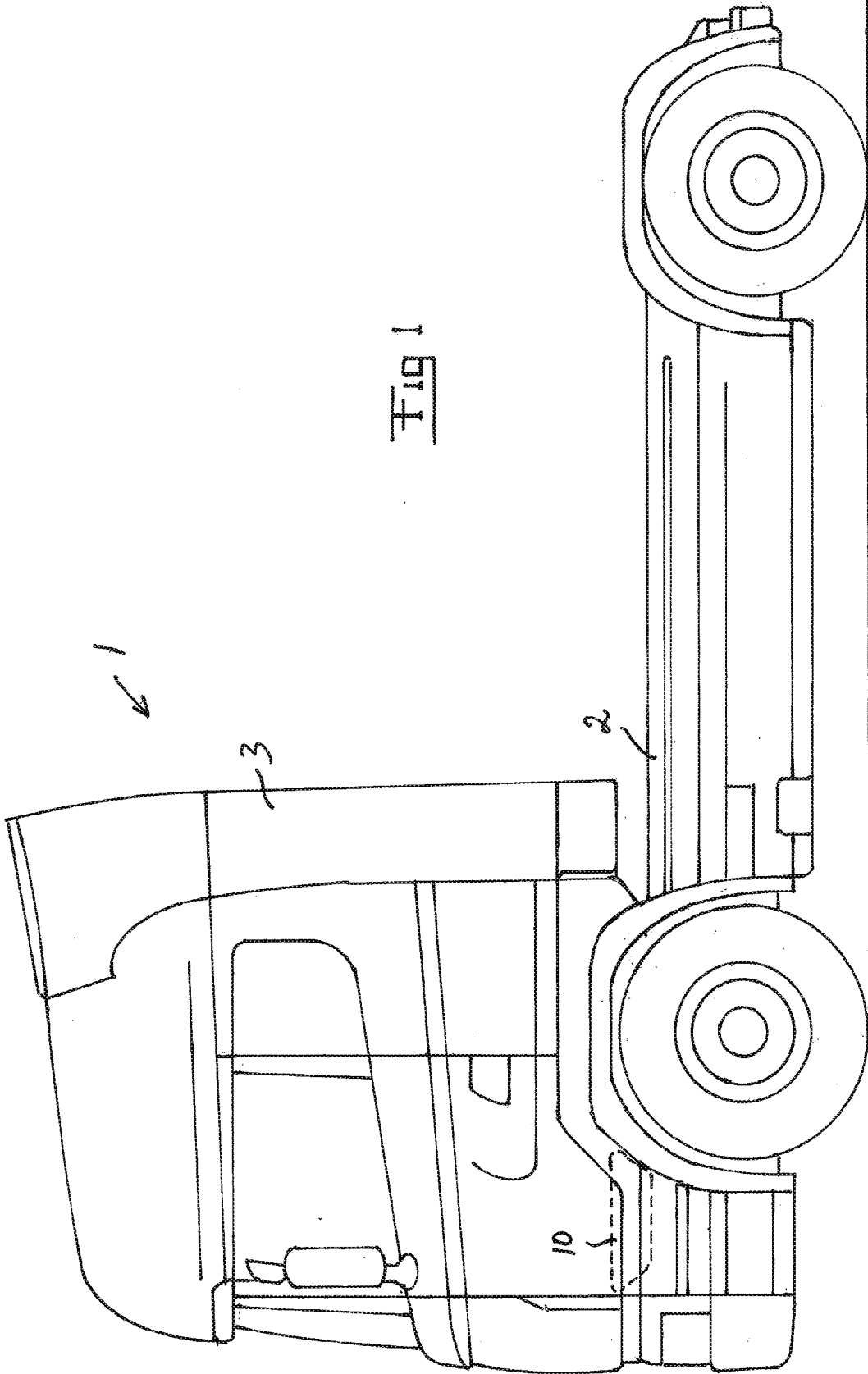
2. Motor vehicle according to claim 1, **characterised in** that the
5 said first section (24a) is arranged on the outside of the liquid container (10).
3. Motor vehicle according to claim 1 or 2, **characterised in** that
10 the said first section (24a) runs into an elongated groove (15) which is arranged inside or on the liquid container (10) and extends between the said first and second ends (11, 12) of this.
4. Motor vehicle according to claim 3, **characterised in** that the
15 said groove (15) is integrated in the liquid container (10).
5. Motor vehicle according to claim 4, **characterised in** that the
said groove (15) is designed as an external recess in the
20 liquid container (10).
6. Motor vehicle according to any of claims 3-5 **characterised in**
that the said groove (15) is arranged on the upper side of the
liquid container (16).
- 25 7. Motor vehicle according to any of claims 1-6, **characterised in**
that the liquid container (10) is a washer fluid container.
8. Motor vehicle according to any of claims 1-6, **characterised in**
that the liquid container (10) is a coolant container.

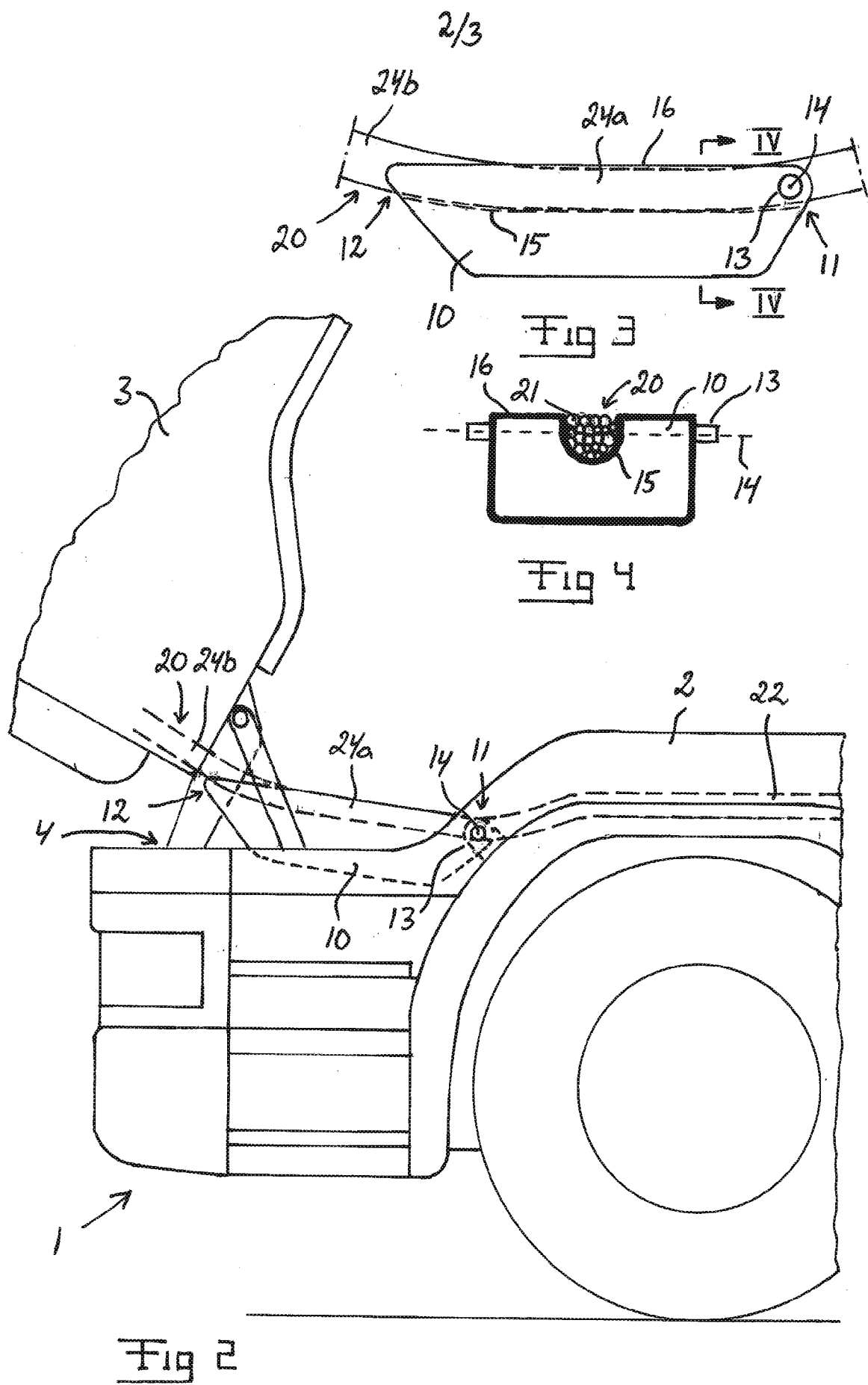
9. Motor vehicle according to any of claims 1-6, **characterised in** that the liquid container (10) is an oil container.

10. Motor vehicle according to any of claims 1-9, **characterised**
5 **in** that the conduit bundle (20) comprises conduits (21) of one or several of the following types: power cable, signal cable, washer fluid pipe, pneumatic cable, hydraulic cable and fuel pipe.

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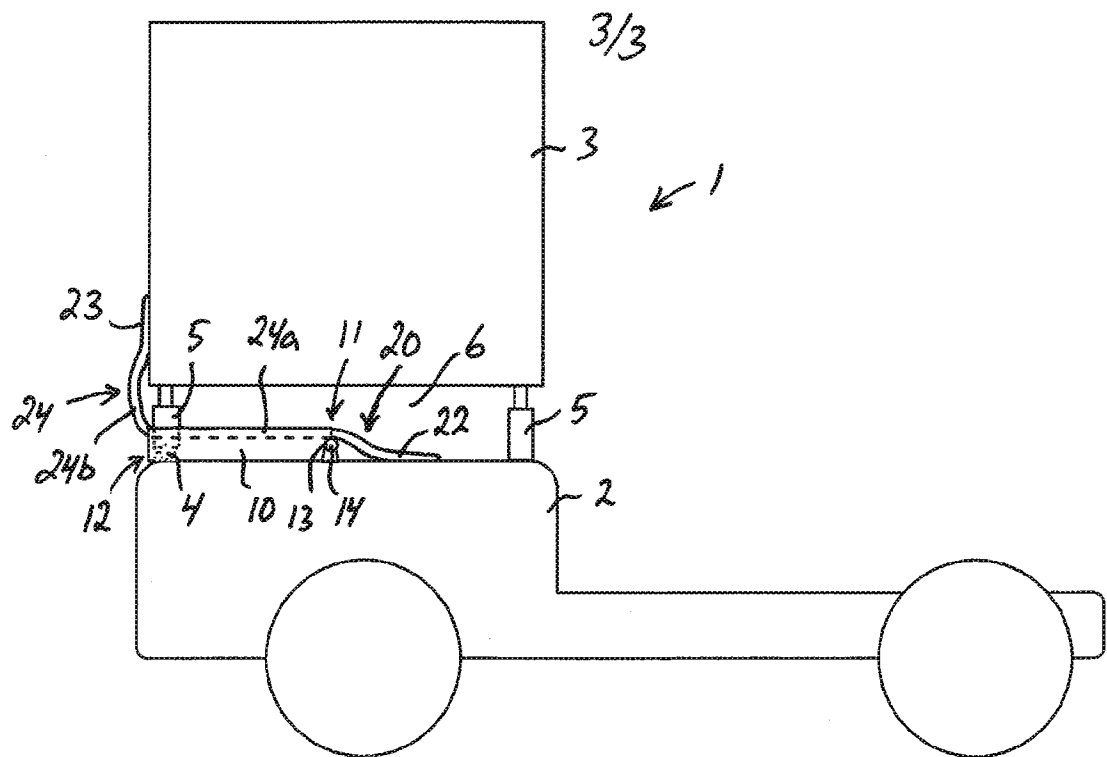


Fig 5

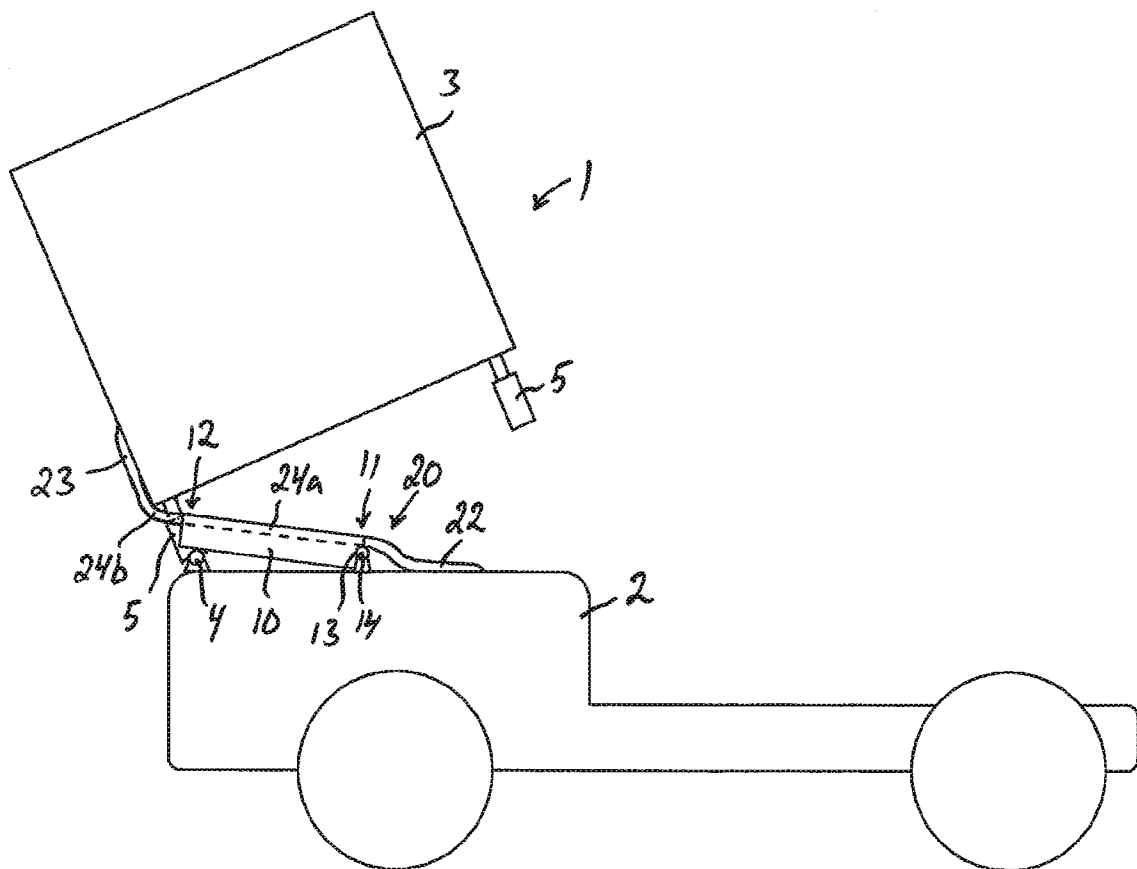


Fig 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2013/051232

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

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)

IPC: B60R, B60S, B62D, F16L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, WPI data, COMPENDEX, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2007084050 A1 (VOLVO LASTVAGNAR AB ET AL), 26 July 2007 (2007-07-26); whole document --	1-10
A	WO 2009041862 A1 (VOLVO LASTVAGNAR AB ET AL), 2 April 2009 (2009-04-02); whole document --	1-10
A	WO 2007060496 A1 (RENAULT TRUCKS ET AL), 31 May 2007 (2007-05-31); whole document --	1-10
A	US 4505348 A (GADEFELT BENGT G ET AL), 19 March 1985 (1985-03-19); whole document --	1-10



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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“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

05-02-2014

Date of mailing of the international search report

05-02-2014

Name and mailing address of the ISA/SE

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INTERNATIONAL SEARCH REPORTInternational application No.
PCT/SE2013/051232

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2061710 A (TALBOT MOTOR), 20 May 1981 (1981-05-20); whole document -- -----	1-10

Continuation of: second sheet

International Patent Classification (IPC)

B60R 16/00 (2006.01)

B60S 1/50 (2006.01)

B62D 33/073 (2006.01)

INTERNATIONAL SEARCH REPORT

Information on patent family members

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GB	2061710 A	20/05/1981	NONE		