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(54) Title: DRIVING MECHANISM FOR A VEHICLE

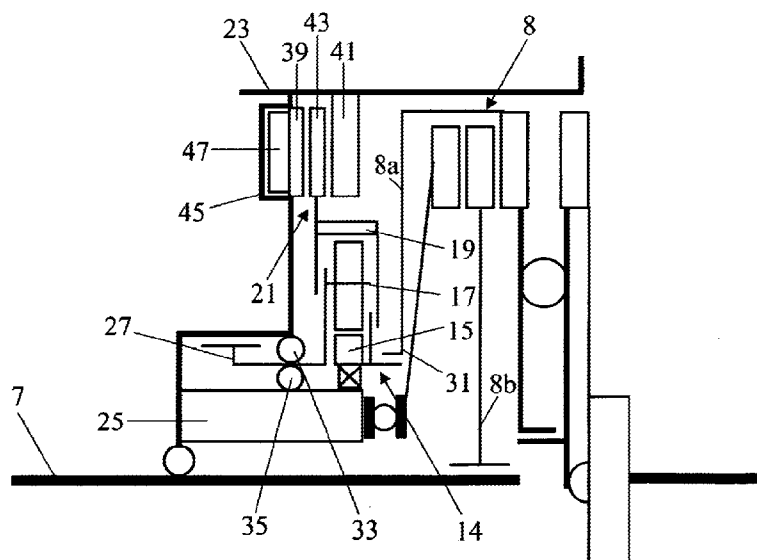


FIG. 2

(57) Abstract: A driving mechanism 1 comprises a drive source 3 which is coupled via a clutch 8 to an oil lubricated transmission 5, and a transmission module 13 which is present parallel to the transmission 5. The transmission module has a grease lubricated planetary gearing 14 of which a first rotational member 15 is bearing supported on an insert sleeve attached to an operating cylinder 25 for the clutch and is connected to a connecting plate 31 which is attached to a first clutch portion 8a of the clutch. A second rotational member 17 is connected to a connecting gear 27. A sealing ring 33 is accommodated between the housing of the transmission and the connecting gear 27 and a further sealing ring 35 is accommodated between the connecting gear 27 and the insert sleeve 29. The third rotational member 19 is formed by a ring gear which has side guards 37 which provide that the grease remains inside the planetary set of gears.

WO 2010/064909 A1

- *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))*

Driving mechanism for a vehicle

DESCRIPTION

Field of the invention.

5

The invention relates to a driving mechanism for a vehicle, comprising a drive source, a transmission having an input shaft and an output shaft and provided with a housing, a clutch present between the drive source and transmission and comprising a first clutch portion which is connected to the drive source and a second clutch portion which is connected to the input shaft of the transmission, and a transmission module having an input which is connected to the first clutch portion and an output which is connected to the output shaft of the transmission, which transmission module comprises a brake as well as a connecting gear and a planetary gear set comprising three rotational members of which a first rotational member is connected to the input, a second rotational member is connected to the connection gear which forms the output and a third rotational member is connected to the brake.

The invention more particularly relates to a driving mechanism for a vehicle in which the transmission module is arranged parallel to the clutch and transmission for transmitting power of the engine to the wheels of the vehicle during the change of the transmission ration.

The transmission is here a continuously variable transmission or a plurality of clutch gears. A clutch gearing may be thought of as being a gear reduction unit in which one of the gears can be coupled to the shaft on which it is bearing supported by closing a synchromesh clutch.

The third rotational member of the planetary gear set can be connected to the firm object via the brake. For example the firm object may be understood to mean the housing of the transmission.

State of the art.

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A driving mechanism of this type is known from WO-A-2004/098937. In this known driving mechanism the planetary gear set is in oil connection to the transmission and

this transmission is sealed by sealing rings to the brake and a clutch installed between the transmission and the drive source. Strict demands are to be set to these sealing rings to guarantee a proper oil sealing.

5 Summary of the invention.

It is an object of the invention to provide a driving mechanism of the type defined in the opening paragraph in which fewer demands are made on the sealings than in the known driving mechanism. To this end the driving mechanism according to the invention
10 is characterised in that the transmission module comprises an insert sleeve which can be connected to or is integral with an operating cylinder for operating the clutch or the housing of the transmission and on which the connecting gear is bearing supported, as well as a housing plate which can be installed against the housing of the transmission or is integral with it, and two sealing rings of which a first sealing ring is accommodated between the
15 housing plate or housing and the connecting gear or a connecting sleeve directly connected thereto and a second sealing ring accommodated between the connecting gear or a connecting sleeve connected to it and the insert sleeve. The transmission module can then be accommodated in the housing of the clutch.

The planetary set of the driving mechanism according to the invention is oil-
20 free while the component parts rotating relative to one another are preferably grease-lubricated and/or provided with a coating. As a result, the planetary set can be simply mounted in the non-oil-lubricated chamber between the transmission and the clutch, so that this planetary set can be integrated well with the flywheel of the drive source and the clutch, which renders possible a compact construction in axial direction. The planetary gear set is
25 then preferably grease lubricated.

An embodiment of the driving mechanism according to the invention is characterised in that the input is formed by a connecting plate which is provided with splines for coupling to the first rotational member of the planetary gear set and which can be connected to or is integrated with the first clutch member.

30 A further embodiment of the driving mechanism according to the invention is characterised in that the brake comprises actuating means which comprise at least three brake cylinders, brake plungers present in the brake cylinders, and brake lines present among the brake cylinders, which actuating means form a closed hydraulic unit which is separately installed in the housing of the transmission. In consequence, there is no need for the housing

of the transmission to be provided with hydraulic channels. Preferably the brake cylinders and brake lines are arranged as one plastic unit.

Brief description of the drawings.

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The invention will be described below in more detail based on an example of embodiment of the transmission module according to the invention represented in the drawing figures, in which:

Fig. 1 shows a schematic diagram of an embodiment of a driving mechanism provided with a transmission module according to the invention;

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Fig. 2 gives a cross-sectional representation of a section of the driving mechanism shown in Fig. 1 present between the transmission and the drive source;

Fig. 3 shows a concrete embodiment of the section shown in Fig. 2;

Fig. 4 shows the actuation means of the brake as a closed hydraulic unit;

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Fig. 5 shows the brake cylinders and brake lines as one plastic unit; and

Fig. 6 gives a representation of a cross-section of an embodiment in concrete form.

Detailed description of the drawings.

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Fig. 1 shows a schematic diagram of an embodiment of a driving mechanism provided with a transmission module according to the invention. The driving mechanism 1 comprises a drive source 3 and an oil-lubricated transmission 5 which is provided with an input shaft 7 which is coupled via a clutch 8 to the drive source, and an output shaft 9 which is connected to driven wheels 11 of a vehicle. The driving mechanism 1 further includes a transmission module 13 which is connected parallel to the transmission 5 to the input and output shaft 7, 9 respectively.

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The transmission module 13 has a grease lubricated, planetary gearing 14 with three rotational members of which a first rotational member 15 is connected to the first clutch portion 8a, a second rotational member 17 is coupled to the output shaft 9 and the third rotational member 19 can be connected via a brake 21 to the housing 23 of the transmission.

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Figs. 2 and 3 give a diagrammatic cross-sectional representation of a section of the driving mechanism shown in Fig. 1 present between the transmission 5 and the drive source 3 and show the section in concrete form, respectively. Around the input shaft 7 of the

transmission is concentrically present a hydraulic cylinder 25 for operating the clutch 8 present between the transmission and the drive source. The first rotational member 15, which is formed by a sun gear, and a connecting gear 27, which is connected to the second rotational member 17, which is formed by a planet carrier are bearing-supported on an insert sleeve 29 (see Fig. 3) which is attached to the hydraulic cylinder 25.

The connecting gear 27 is then bearing-mounted on the insert sleeve 29 in axial and radial direction by means of a plain bearing. The connecting gear is connected to the second rotational member 17 via splines s_1 (see Fig. 3). The first rotational member 15 is connected via further splines s_2 to a connecting plate 31 which is attached to a first clutch portion 8a of the clutch. A second clutch portion 8b of the clutch is connected to the input shaft 7 of the transmission 5.

Between the housing 23 of the transmission and the connecting gear 27 is applied a sealing ring 33 and between the connecting gear 27 and the insert sleeve 29 is applied a further sealing ring 35.

The third rotational member 19 is formed by a ring gear which has side guards 37 which provide that the grease remains inside the planetary set of gears.

The brake 21 comprises two interconnected brake plates 39, 41 and a brake disc 43 arranged between them. The first brake plate 39 is actuated by actuation means. The second brake plate 41 is attached to the housing 23.

The actuation means are formed by three brake cylinders 45 accommodated in the housing with movable brake plungers 47 inside the cylinders. The brake cylinders are connected to one another via brake lines 49 and to connecting pieces 51, see Fig. 4. The actuating means form a closed hydraulic unit 53 which is accommodated separately in the housing of the transmission. The brake cylinders as well as the brake lines are arranged as one whole 55 in plastic, see Fig. 5.

Fig. 6 shows by way of illustration another concrete representation of an embodiment in a cross-sectional view. The housing plate 23' is here a separate plate which is connected to the housing 23 and a connecting sleeve 27' is directly connected to the connecting gear 27, in this embodiment by way of example by means of splines but this may obviously also be effected in a different manner.

Albeit the invention has been described in the foregoing based on the drawings, it should be observed that the invention is not by any manner or means restricted to the embodiment shown in the drawings. The invention also extends to all embodiments

deviating from the embodiment shown in the drawings within the spirit and scope defined by the claims.

CLAIMS:

1. A driving mechanism for a vehicle, comprising a drive source, a transmission having an input shaft and an output shaft and provided with a housing, a clutch present between the drive source and transmission and comprising a first clutch portion which is connected to the drive source and a second clutch portion which is connected to the input shaft of the transmission, and a transmission module having an input which is connected to the first clutch portion and an output which is connected to the output shaft of the transmission, which transmission module comprises a brake as well as a connecting gear and a planetary gear set comprising three rotational members of which a first rotational member is connected to the input, a second rotational member is connected to the connection gear which forms the output and a third rotational member is connected to the brake, characterised in that the transmission module comprises an insert sleeve which can be connected to or is integral with an operating cylinder for operating the clutch or the housing of the transmission and on which the connecting gear is bearing supported, as well as a housing plate which can be installed against the housing of the transmission or is integral with it, and two sealing rings of which a first sealing ring is accommodated between the housing plate or housing and the connecting gear or a connecting sleeve directly connected thereto and a second sealing ring accommodated between the connecting gear or a connecting sleeve connected to it and the insert sleeve.

2. A driving mechanism as claimed in claim 1, characterised in that the input is formed by a connecting plate which is provided with splines for coupling to the first rotational member of the planetary gear set and which can be connected to or is integrated
5 with the first clutch member.

3. A driving mechanism as claimed in claim 1 or 2, characterised in that the brake comprises actuating means which comprise at least three brake cylinders, brake plungers present in the brake cylinders, and brake lines present among the brake cylinders, which actuating means form a closed hydraulic unit which is separately installed in the
10 housing of the transmission.

4. A driving mechanism as claimed in claim 3, characterised in that the brake cylinders and brake lines are arranged as one plastic unit.

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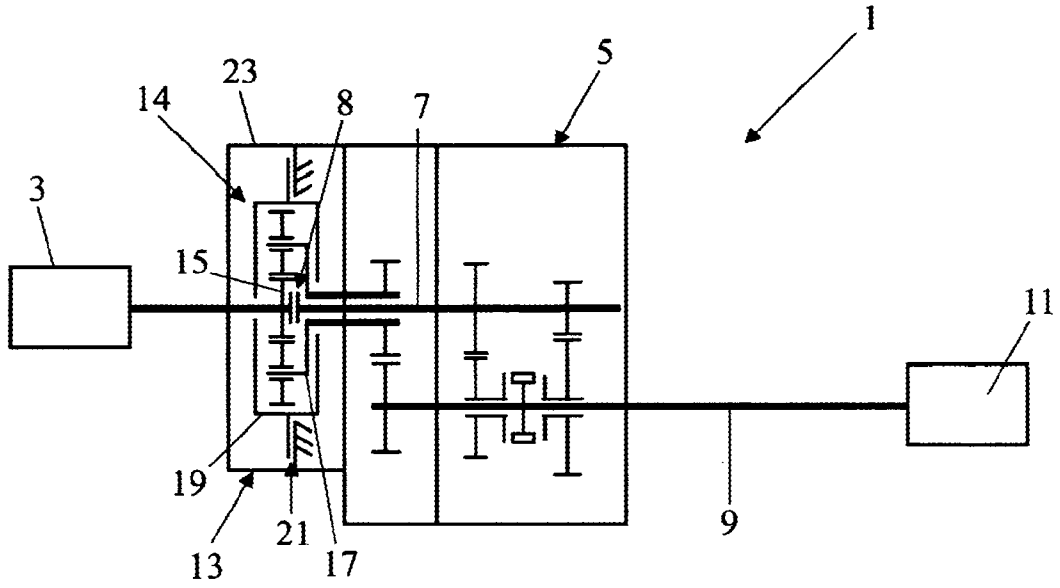


FIG. 1

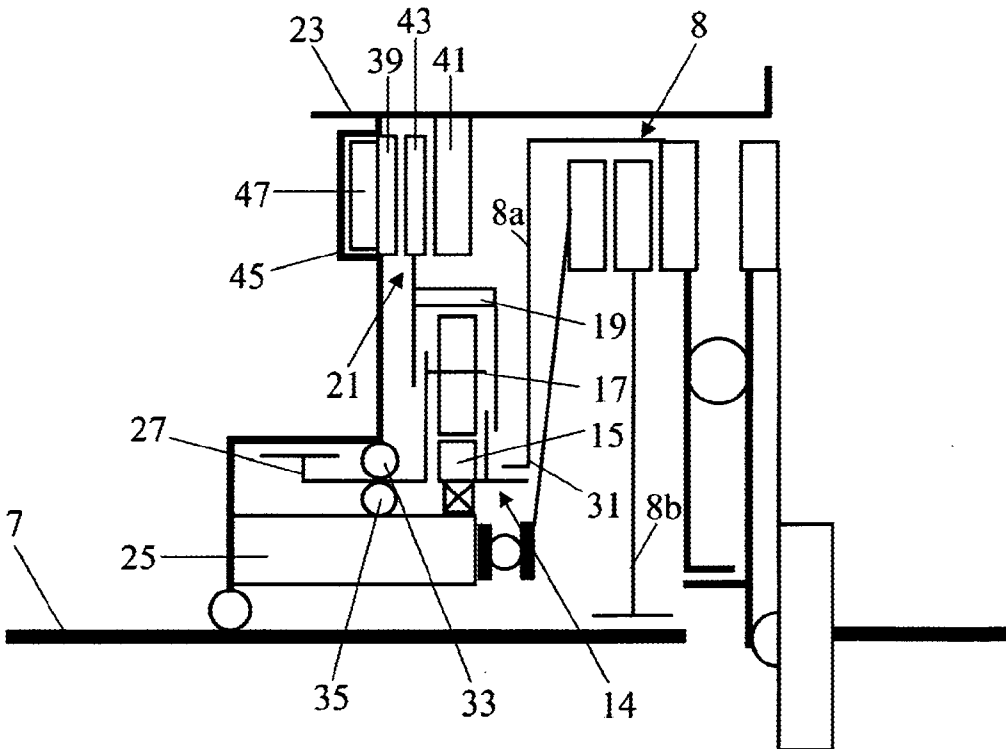


FIG. 2

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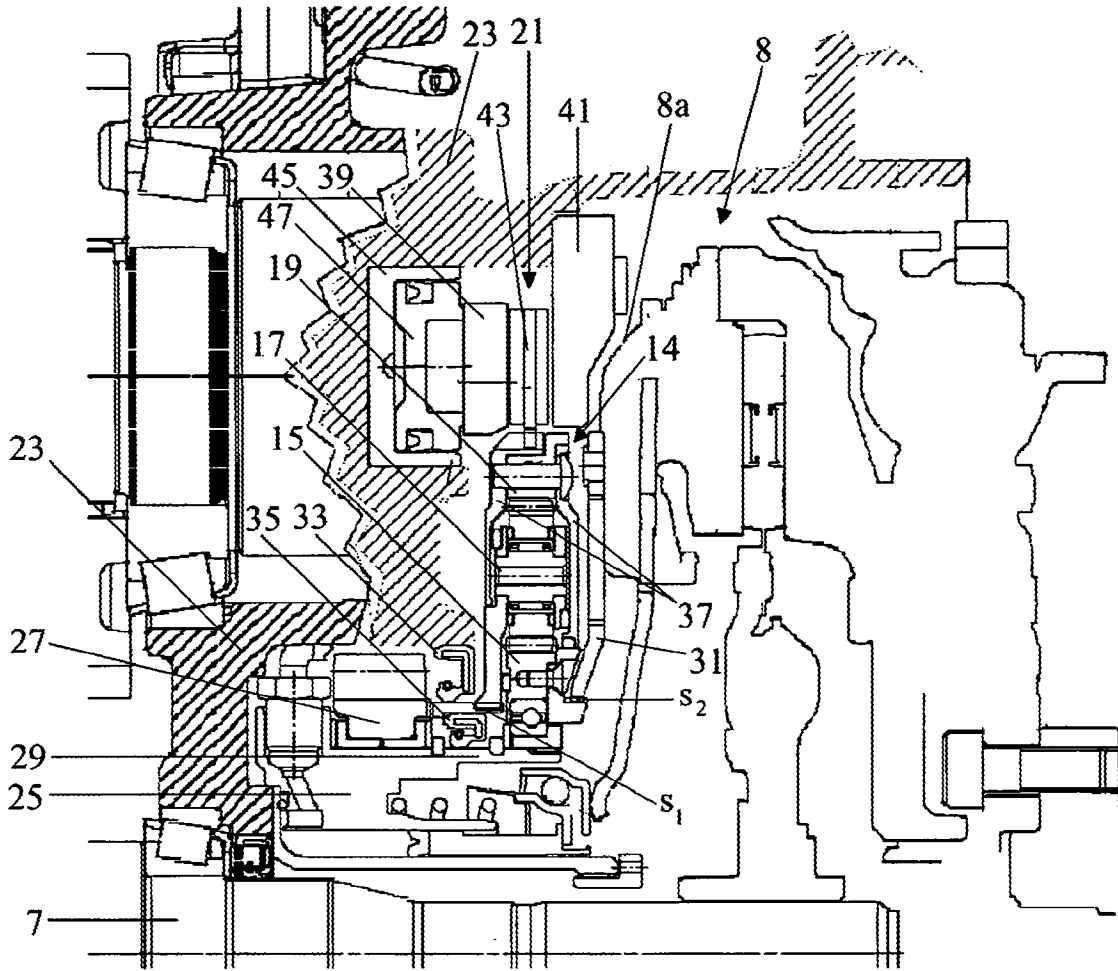


FIG. 3

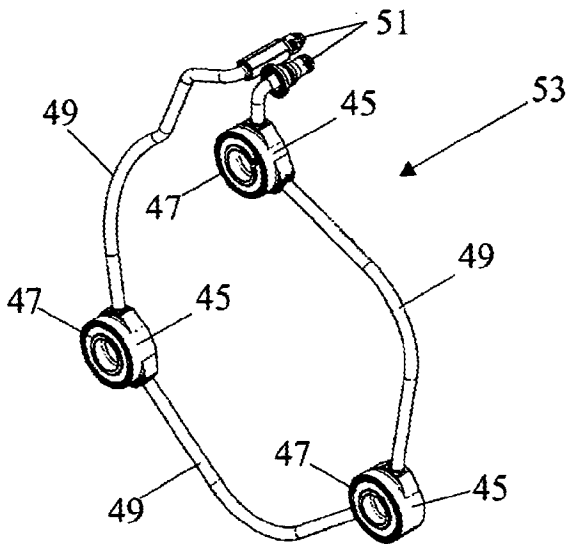


FIG. 4

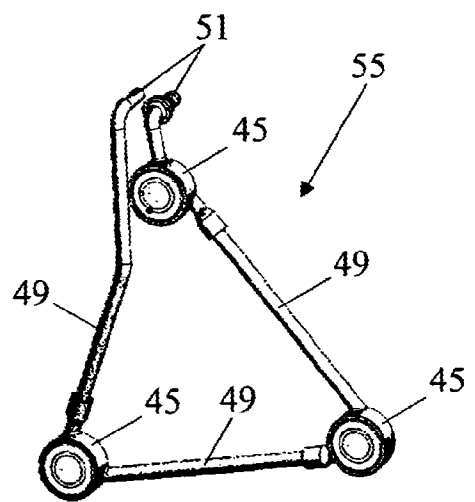


FIG. 5

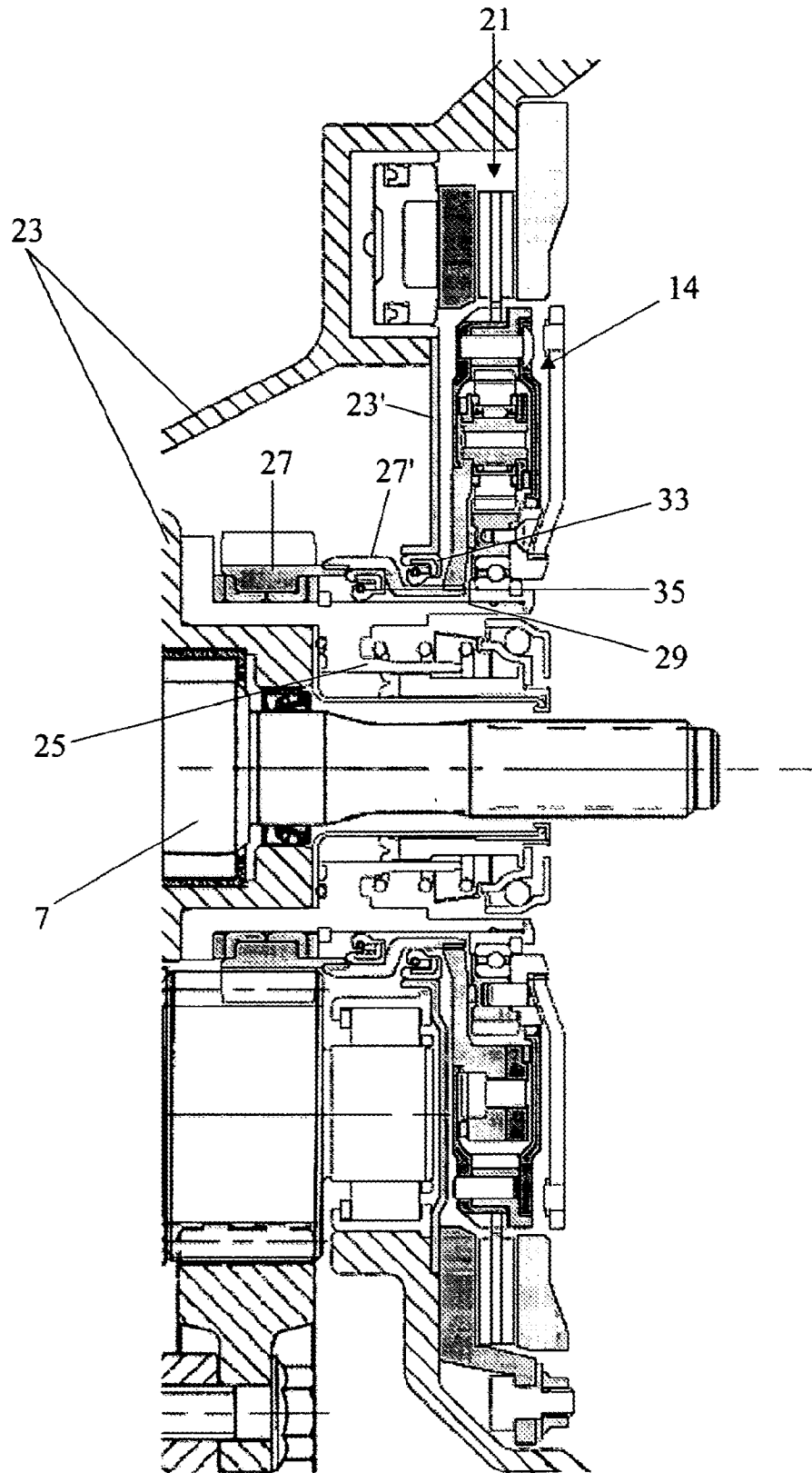


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2009/050732

A. CLASSIFICATION OF SUBJECT MATTER INV. F16D25/08 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) F16D B60K F16H		
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 practical, 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.
A	WO 2004/098937 A1 (DTI GROUP B V [NL]; VAN DRUTEN ROELL MARIE [NL]; VROEMEN BAS GERARD [N] 18 November 2004 (2004-11-18) cited in the application page 11, line 12 - page 12, line 13	1-4
A	DE 199 49 205 A1 (LUK LAMELLEN & KUPPLUNGSBAU [DE]) 20 April 2000 (2000-04-20) column 11, line 58 - column 12, line 19	1-4
A	FR 2 757 590 A1 (VALEO [FR]) 26 June 1998 (1998-06-26) page 6, line 10 - page 7, line 21	1-4
<input type="checkbox"/> Further documents are listed in the continuation of Box C.		
<input checked="" type="checkbox"/> 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	"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	
"E" earlier document but published on or after the international filing date	"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	
"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)	"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.	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search <h3 style="text-align: center;">13 April 2010</h3>	Date of mailing of the international search report <h3 style="text-align: center;">20/04/2010</h3>	
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 <h2 style="text-align: center;">Nielles, Daniel</h2>	

INTERNATIONAL SEARCH REPORT

Information on patent family members

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