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(71) Applicant: SCANIA CV AB [SE/SE]; 151 87 Södertälje (SE).

(72) Inventors: FLORÉN, Nichlas; Folkungavägen 8B, 611 34 Nyköping (SE). DAHLBÄCK, Märten; Liljevägen 8, 181 61 Lidingö (SE). ARNELÖF, Per; Albatrossvägen 5, 136 66 Vendelsö (SE).

(74) Agent: SANDBERG, Mikael; Scania CV AB, 151 87 Södertälje (SE).

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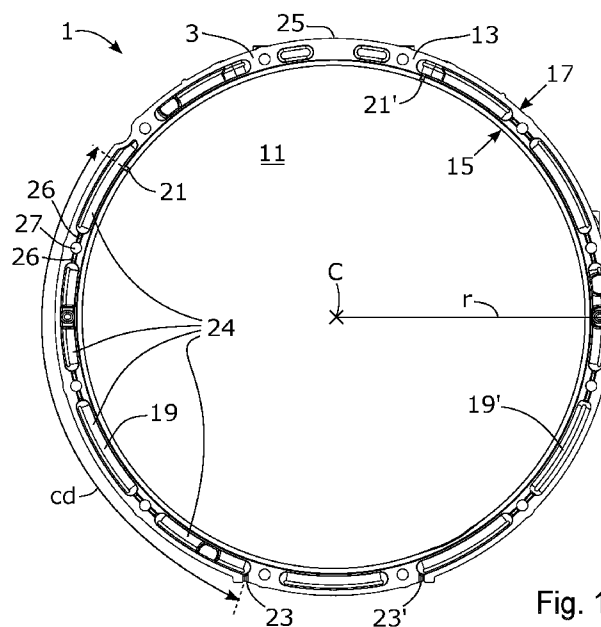


Fig. 1

(57) Abstract: A transmission housing part (1) is disclosed comprising a flange (3) arranged to be mounted to a second flange (5) of a second housing part (7). The flange (3) comprises a flange surface (13) having an inner delimiting surface (15), an outer delimiting surface (17), and a recess (19) extending along the flange surface (13). The flange surface (13) comprises an inner groove (21) extending through the inner delimiting surface (15) into the recess (19), and an outer groove (23) extending through the outer delimiting surface (17) into the recess (19). The present disclosure further relates to a transmission component (30), a power train (32), and a vehicle (40).

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,
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Transmission Housing part, Transmission Component and Related Devices

TECHNICAL FIELD

5 The present disclosure relates to a transmission housing part comprising a flange. The present disclosure further relates to a transmission component comprising a transmission housing part and a second housing part. Moreover, the present disclosure relates to a power train comprising a transmission component, as well as a vehicle comprising a power train.

10 BACKGROUND

Transmission components, such as clutches, gearboxes, and the like, most often comprise a housing which accommodates shafts, gears, friction discs and the like. A problem associated with transmission components is that they can generate a lot of heat in short time periods which quickly affects air in the housing which thereby expands. Moreover, when parking a
15 vehicle, for example in a cold climate, the air in the housing will cool down and will as a result be compressed. An overpressure, as well as a negative pressure, in the housing may damage seals and may cause unwanted leakages. In order to avoid overpressure or negative pressure in the housing, the housing is preferably vented. However, the housing should not be completely open so that, for example, water and dirt can enter the housing.

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Furthermore, generally, on today's consumer market, it is an advantage if products have conditions and/or characteristics suitable for being manufactured and assembled in a cost-efficient manner.

25 SUMMARY

It is an object of the present invention to overcome, or at least alleviate, at least some of the above-mentioned problems and drawbacks.

According to a first aspect of the invention, the object is achieved by a transmission housing
30 part comprising a flange. The flange is arranged to be mounted to a second flange of a second housing part in order to accommodate a transmission arrangement in an inner volume formed by the transmission housing part and the second housing part. The flange comprises a flange surface having an inner delimiting surface and an outer delimiting surface. The flange further comprises a recess extending along the flange surface. The
35 flange surface comprises an inner groove extending through the inner delimiting surface into the recess, and an outer groove extending through the outer delimiting surface into the recess.

Since the flange surface comprises an inner groove extending through the inner delimiting surface into the recess, and an outer groove extending through the outer delimiting surface into the recess, a transmission housing part is provided in which a venting channel is formed through the inner groove, the recess, and the outer groove when the flange is mounted to the second flange. In this manner, an efficient venting of a transmission component comprising the transmission housing part is provided in a simple and cost-efficient manner. Moreover, the need for a separate venting arrangement for venting the transmission component is circumvented, which would add cost and complexity to the transmission component. In addition, since the need for a separate venting arrangement is circumvented, more space is available for other components, arrangements and systems in a vehicle comprising the transmission housing part.

Thus, a transmission housing part is provided having conditions and characteristics suitable for reducing cost and facilitating assembly of a transmission component.

Accordingly, a transmission housing part is provided overcoming, or at least alleviating, at least some of the above-mentioned problems and drawbacks. As a result, the above-mentioned object is achieved.

Optionally, the recess is elongated and is provided at a position between the inner delimiting surface and the outer delimiting surface. Thereby, conditions are provided for forming a venting channel efficiently venting the transmission component when the flange is mounted to the second flange.

Optionally, at least portions of the recess are made in a casting process of the transmission housing part. Thus, the venting channel can be provided using an already present structure of the flange, simply by making the inner and outer groove in the casting process, or in a subsequent manufacturing step after the casting process of the transmission housing part.

Thus, a transmission housing part is provided having conditions and characteristics suitable for reducing cost and facilitating assembly of a transmission component.

Optionally, the flange is substantially circular, and wherein the recess is substantially arc-shaped. Thereby, conditions are provided for forming a venting channel efficiently venting the transmission component when the flange is mounted to the second flange.

Optionally, the curvature of the arc-shaped recess substantially coincides with the curvature of the substantially circular flange. Thereby, conditions are provided for forming a venting channel efficiently venting the transmission component when the flange is mounted to the second flange.

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Optionally, the outer groove is arranged at a circumferential distance from the inner groove. Thereby, water, dirt, and particles are less likely to enter the transmission component when the flange is mounted to the second flange. Accordingly, a transmission housing part is provided capable of forming a venting channel of a transmission component, wherein the venting channel is less likely to conduct water, dirt, and particles into the transmission component.

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Optionally, the flange is substantially circular, and wherein the circumferential distance is greater than the radius of the flange. Thereby, a transmission housing part is provided capable of forming a venting channel of a transmission component, wherein the venting channel is even less likely to conduct water, dirt, and particles into the transmission component.

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Optionally, the flange comprises a top portion, wherein the top portion is the top portion of the flange relative the gravitational field at the location of the transmission housing part when the transmission housing part is positioned in an upright use position, and wherein the inner groove is arranged closer to the top portion than the outer groove. Thereby, a transmission housing part is provided capable of forming a venting channel of a transmission component, wherein the venting channel is even less likely to conduct water, dirt, and particles into the transmission component. Moreover, wanted substances in the inner volume, such as oil, is prevented from flowing out of the inner volume, via the venting channel formed by the recess, when the flange is mounted to the second flange.

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Optionally, the flange comprises a second recess extending along the flange surface, and wherein the flange surface comprises a second inner groove extending through the inner delimiting surface into the second recess, and a second outer groove extending through the outer delimiting surface into the second recess. Since the flange surface comprises a second inner groove extending through the inner delimiting surface into the second recess, and a second outer groove extending through the outer delimiting surface into the second recess, a transmission housing part is provided in which a venting channel is also formed through the second inner groove, the second recess, and the second outer groove when the flange is

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mounted to the second flange. Thus, an efficient venting of a transmission component comprising the transmission housing part is provided in a simple and cost-efficient manner.

According to a second aspect of the invention, the object is achieved by a transmission component comprising a transmission housing part and a second housing part according to some embodiments of the present disclosure.

Thereby, a transmission component is provided in which a venting channel is formed through the inner groove, the recess, and the outer groove when the flange of the transmission housing part is mounted to the second flange of the second housing part. Thus, an efficient venting of the transmission component is provided in a simple and cost-efficient manner, and the need for a separate venting arrangement for venting the transmission component is circumvented which would add cost and complexity to the transmission component. In addition, since the need for a separate venting arrangement is circumvented, more space is available for other components, arrangements and systems in a vehicle comprising the transmission component.

Thus, a transmission component is provided having conditions and characteristics suitable for being manufactured and assembled in a cost-efficient manner.

Accordingly, a transmission component is provided overcoming, or at least alleviating, at least some of the above-mentioned problems and drawbacks. As a result, the above-mentioned object is achieved.

Optionally, the transmission component is a clutch. Thereby, an efficient venting of the clutch is provided in a simple and cost-efficient manner, and the need for a separate venting arrangement for venting the clutch is circumvented.

According to a third aspect of the invention, the object is achieved by a power train comprising a transmission component according to some embodiments of the present disclosure.

Thereby, a power train is provided comprising a transmission component in which a venting channel is formed through the inner groove, the recess, and the outer groove when the flange of the transmission housing part is mounted to the second flange of the second housing part. Thus, a power train is provided in which venting of the transmission component is provided in a simple and cost-efficient manner, and the need for a separate venting

arrangement for venting the transmission component is circumvented which would add cost and complexity to the powertrain. In addition, since the need for a separate venting arrangement is circumvented, more space is available for other components, arrangements and systems in a vehicle comprising the power train.

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Thus, a power train is provided having conditions and characteristics suitable for being manufactured and assembled in a more cost-efficient manner.

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Accordingly, a power train is provided overcoming, or at least alleviating, at least some of the above-mentioned problems and drawbacks. As a result, the above-mentioned object is achieved.

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According to a fourth aspect of the invention, the object is achieved by a vehicle comprising a power train according to some embodiments of the present disclosure.

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Thereby, a vehicle is provided comprising a transmission component in which a venting channel is formed through the inner groove, the recess, and the outer groove when the flange of the transmission housing part is mounted to the second flange of the second housing part. Thus, a vehicle is provided in which venting of the transmission component is provided in a simple and cost-efficient manner, and the need for a separate venting arrangement for venting the transmission component is circumvented which would add cost and complexity to the vehicle. In addition, since the need for a separate venting arrangement is circumvented, more space is available for other components, arrangements, and systems in the vehicle.

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Thus, a vehicle is provided having conditions and characteristics suitable for being manufactured and assembled in a more cost-efficient manner.

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Accordingly, a vehicle is provided overcoming, or at least alleviating, at least some of the above-mentioned problems and drawbacks. As a result, the above-mentioned object is achieved.

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Further features of, and advantages with, the present invention will become apparent when studying the appended claims and the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

Various aspects of the invention, including its particular features and advantages, will be readily understood from the example embodiments discussed in the following detailed description and the accompanying drawings, in which:

Fig. 1 illustrates a transmission housing part according to some embodiments,
Fig. 2 illustrates a power train according to some embodiments, and
Fig. 3 illustrates a vehicle according to some embodiments.

DETAILED DESCRIPTION

Aspects of the present invention will now be described more fully. Like numbers refer to like elements throughout. Well-known functions or constructions will not necessarily be described in detail for brevity and/or clarity.

Fig. 1 illustrates a transmission housing part 1, according to some embodiments. According to the illustrated embodiments, the transmission housing part 1 is a flywheel housing part, made in accordance with the standard ISO 7649:1991. According to further embodiments, the transmission housing part 1 may be a clutch housing part, a gearbox housing part, or the like. The transmission housing part 1, as referred to herein, may be an integral part of an engine, a clutch, a gearbox, or the like, or may be a separate part arranged to be mounted to an engine, a clutch, a gearbox, or the like. The transmission housing part 1 comprises a flange 3. As is further explained herein, the flange 3 is arranged to be mounted to a second flange of a second housing part in order to accommodate a transmission arrangement in an inner volume 11 formed by the transmission housing part 1 and the second housing part.

The flange 3 comprises a flange surface 13 having an inner delimiting surface 15 and an outer delimiting surface 17. According to the illustrated embodiments, at least portions of the flange surface 13 extends in a flat plane. The inner delimiting surface 15, as referred to herein, may also be referred to as a radially inner delimiting surface 15, and the outer delimiting surface 17, as referred to herein, may also be referred to as a radially outer delimiting surface 17. The inner delimiting surface 15 faces the inner volume 11 and the outer delimiting surface 17 faces the environment outside of the inner volume 11 when the flange 3 is mounted to a second flange of a second housing part. The flange 3 further comprises a recess 19 extending along the flange surface 13. The flange surface 13 comprises an inner groove 21 extending through the inner delimiting surface 15 into the recess 19. Moreover, the flange surface 13 comprises an outer groove 23 extending through the outer delimiting surface 17 into the recess 19.

In this manner, a venting channel is formed via the inner groove 21, the recess 19 and the outer groove 23 when the flange 3 is mounted to a second flange of a second housing part. Thus, during operation of a transmission component comprising the transmission housing part 1, air can be evacuated from the inner volume 11, to the environment outside of the inner volume 11 via the inner groove 21, the recess 19 and the outer groove 23, for example during an increase in temperature of the air inside the inner volume 11. Likewise, for example when temperature of the air inside the inner volume 11 decreases, air can flow into the inner volume 11 from the environment outside of the inner volume 11 via the outer groove 23, the recess 19 and the inner groove 21.

Thus, due to these features, a transmission housing part 1 is provided circumventing the need for a separate venting arrangement for venting the inner volume 11 of a transmission component. The inner groove 21, as referred to herein, may also be referred to as a radially inner groove 21, and the outer groove 23, as referred to herein, may also be referred to as a radially outer groove 23.

As can be seen in Fig. 1, the recess 19 is elongated and is provided at a position between the inner delimiting surface 15 and the outer delimiting surface 17. The flange 3 is substantially circular, and wherein the recess 19 is substantially arc-shaped. The curvature of the arc-shaped recess 19 substantially coincides with the curvature of the substantially circular flange 3. Moreover, according to the illustrated embodiments, at least portions 24 of the recess 19 are made in a casting process of the transmission housing part 1. That is, the recess 19 comprises at least portions 24 which are made in the casting process of the transmission housing part 1. The original purpose of the portions 24 of the recess 19 may be to ensure a more uniform wall thickness of the transmission housing part 1 in the casting process of the transmission housing part 1. According to the illustrated embodiments, the flange 3 comprises grooves 26 extending along the flange surface 13 between the portions 24 of the recess 19. The grooves 26 fluidly connects the portions 24 of the recess 19 when the flange 3 is mounted to the second flange. The grooves 26 may be made in the casting process of the transmission housing part 1, or in a subsequent manufacturing process after the casting process of the transmission housing part 1, for example using milling or grinding.

The flange 3 comprises a number of holes 27 arranged to receive fastening elements, such as bolts, when mounting the flange 3 to the second flange. The holes 27 may be through holes and/or threaded holes. According to the illustrated embodiments, the grooves 26 extend over the holes 27. Thus, according to the illustrated embodiments, two adjacent portions 24 of the recess 19 are fluidly connected via grooves 26 and a hole 27 when the

flange 3 is mounted to the second flange. Accordingly, the recess 19, as referred to herein, may comprise the portions 24 made in the casting process of the transmission housing part 1, the grooves 26, and/or the holes 27 for receiving fastening elements.

5 As can be seen in Fig. 1, the outer groove 23 is arranged at a circumferential distance cd from the inner groove 21, wherein the circumferential distance cd is greater than the radius r of the flange 3. Thereby, water, dirt, and particles are less likely to enter the inner volume 11 when the flange 3 is mounted to the second flange. The radius r of the flange 3 may be defined as the distance between a centre point C of the flange 3 to the outer delimiting
10 surface 17 of the flange 3. As mentioned above, the transmission housing part 1 according to the illustrated embodiments is a flywheel housing part. According to these embodiments, the centre point C of the flange 3 coincides with a rotation axis of the flywheel.

As indicated in Fig. 1, the flange 3 comprises a top portion 25. The top portion 25 is the top
15 portion of the flange 3 relative the gravitational field at the location of the transmission housing part 1 when the transmission housing part 1 is positioned in an upright use position. In Fig. 1, the transmission housing part 1 is illustrated in the upright use position. The upright use position corresponds to a position obtained when the flange 3 is mounted to a second flange of a second housing part in a transmission component of a vehicle. As can be seen in
20 Fig. 1, the inner groove 21 is arranged closer to the top portion 25 than the outer groove 23. Moreover, according to the illustrated embodiments, the inner groove 21 is arranged above the centre point C of the flange 3, and the outer groove 23 is arranged below the centre point C of the flange 3, when the transmission housing part 1 is positioned in the upright use position. Due to these features, water, dirt, and particles are less likely to enter the inner
25 volume 11 when the flange 3 is mounted to the second flange. Moreover, wanted substances in the inner volume 11, such as oil, is prevented from flowing out of the inner volume 11 via the venting channel formed by the recess 19 when the flange 3 is mounted to the second flange.

30 According to the illustrated embodiments, the flange 3 comprises a second recess 19' extending along the flange surface 13. Moreover, the flange surface 13 comprises a second inner groove 21' extending through the inner delimiting surface 15 into the second recess 19', and a second outer groove 23' extending through the outer delimiting surface 17 into the second recess 19'. In this manner, a venting channel is formed also via the second inner
35 groove 21', the second recess 19' and second outer groove 23' when the flange 3 is mounted to the second flange. Thus, during operation of a transmission component comprising the transmission housing part 1, air can be evacuated from the inner volume 11,

to the environment outside of the inner volume 11 via the second inner groove 21', the second recess 19', and the second outer groove 23', for example during an increase in temperature of the air inside the inner volume 11. Likewise, for example when temperature of the air inside the inner volume 11 decreases, air can flow into the inner volume 11 from the environment outside of the inner volume 11 via the second outer groove 23', the second recess 19' and the second inner groove 21'. The second outer groove 23', the second recess 19' and the second inner groove 21' comprise corresponding features, functions and advantages as the outer groove 23, the recess 19 and the inner groove 21, and will not be further explained herein. In embodiments where the flange 3 comprises two recesses 19, 19', the wording "recess 19", as used herein, may be replaced by the wording "first recess 19". Likewise, in such embodiments, the wording "inner groove 21", as used herein, may be replaced by the wording "first inner groove 21", and the wording "outer groove 23", as used herein, may be replaced by the wording "first outer groove 23".

Fig. 2 illustrates a power train 32 according to some embodiments. The power train 32 comprises a power source 34 and a transmission 36. The power source 34 is arranged to provide motive power to a vehicle, and the transmission 36 is arranged to transfer torque between the power source 34 and wheels 38 of the vehicle. The transmission 36 comprises a transmission component 30, which according to the illustrated embodiments is a clutch. The transmission 36 further comprises a gearbox 39. The transmission component 30 is thus arranged to control the torque transferred between the power source 34 and the gearbox 39. The power source 34 may comprise an internal combustion engine, for example a compression ignition engine, such as a diesel engine, or an Otto engine with a spark-ignition device, wherein the Otto engine may be configured to run on gas, petrol, alcohol, similar volatile fuels, or combinations thereof. As an alternative, or in addition, the power source 34 may comprise one or more electrical machines.

The transmission component 30 comprises a transmission housing part 1 according to the embodiments illustrated in Fig. 1 and a second housing part 7. The "second housing part 7", as referred to herein, may also be referred to as a "second transmission housing part 7". According to the embodiments illustrated in Fig. 2, the transmission housing part 1 may be referred to as a flywheel housing part, which may be an integral part of the power source 34 or may be a separate transmission housing part 1 mounted onto the power source 34. Moreover, according to the embodiments illustrated in Fig. 2, the second housing part 7 may be referred to as a clutch housing part, which may be an integral part of the gearbox 39 or may be mounted onto the gearbox 39.

As illustrated in Fig. 2, the flange 3 of the transmission housing part 1 is mounted to a second flange 5 of the second housing part 7 in order to accommodate a transmission arrangement 9 in an inner volume 11 formed by the transmission housing part 1 and the second housing part 7. According to the illustrated embodiments, the transmission

arrangement 9 is a clutch arrangement comprising friction discs. The second flange 5 of the second housing part 7 may comprise a flat flange surface. As an alternative, the second flange 5 of the second housing part 7 may share one or more features with the flange 3 depicted in Fig. 1.

Fig. 3 illustrates a vehicle 40, according to some embodiments. The vehicle 40 comprises a power train 32 according to the embodiments illustrated in Fig. 2. The power train 32 is arranged to provide motive power to the vehicle 40 via wheels 38 of the vehicle 40.

According to the illustrated embodiments, the vehicle 40 is a truck. However, according to further embodiments, the vehicle 40, as referred to herein, may be another type of manned or unmanned vehicle for land or water based propulsion such as a lorry, a bus, a construction vehicle, a tractor, a car, a ship, a boat, or the like.

It is to be understood that the foregoing is illustrative of various example embodiments and that the invention is defined only by the appended claims. A person skilled in the art will realize that the example embodiments may be modified, and that different features of the example embodiments may be combined to create embodiments other than those described herein, without departing from the scope of the present invention, as defined by the appended claims.

As used herein, the term "comprising" or "comprises" is open-ended, and includes one or more stated features, elements, steps, components or functions but does not preclude the presence or addition of one or more other features, elements, steps, components, functions or groups thereof.

CLAIMS

1. A transmission housing part (1) comprising a flange (3),
wherein the flange (3) is arranged to be mounted to a second flange (5) of a
5 second housing part (7) in order to accommodate a transmission arrangement (9) in an
inner volume (11) formed by the transmission housing part (1) and the second housing
part (7),
wherein the flange (3) comprises a flange surface (13) having an inner
delimiting surface (15) and an outer delimiting surface (17),
10 wherein the flange (3) further comprises a recess (19) extending along the
flange surface (13),
and wherein the flange surface (13) comprises an inner groove (21) extending
through the inner delimiting surface (15) into the recess (19), and
an outer groove (23) extending through the outer delimiting surface (17) into the
15 recess (19).
2. The transmission housing part (1) according to claim 1, wherein the recess (19) is
elongated and is provided at a position between the inner delimiting surface (15) and the
outer delimiting surface (17).
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3. The transmission housing part (1) according to claim 1 or 2, wherein at least portions
(24) of the recess (19) are made in a casting process of the transmission housing part
(1).
- 25 4. The transmission housing part (1) according to any one of the preceding claims, wherein
the flange (3) is substantially circular, and wherein the recess (19) is substantially arc-
shaped.
5. The transmission housing part (1) according to claim 5, wherein the curvature of the arc-
30 shaped recess (19) substantially coincides with the curvature of the substantially circular
flange (3).
6. The transmission housing part (1) according to any one of the preceding claims, wherein
the outer groove (23) is arranged at a circumferential distance (cd) from the inner groove
35 (21).

7. The transmission housing part (1) according to claim 6, wherein the flange (3) is substantially circular, and wherein the circumferential distance (cd) is greater than the radius (r) of the flange (3).

8. The transmission housing part (1) according to any one of the preceding claims, wherein the flange (3) comprises a top portion (25), wherein the top portion (25) is the top portion of the flange (3) relative the gravitational field at the location of the transmission housing part (1) when the transmission housing part (1) is positioned in an upright use position, and wherein the inner groove (21) is arranged closer to the top portion (25) than the outer groove (23).

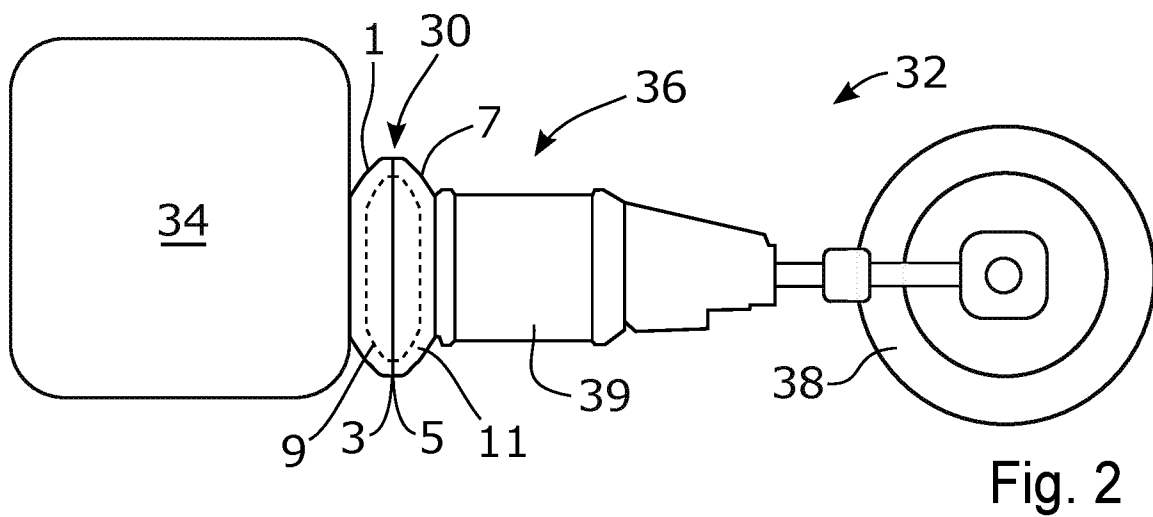
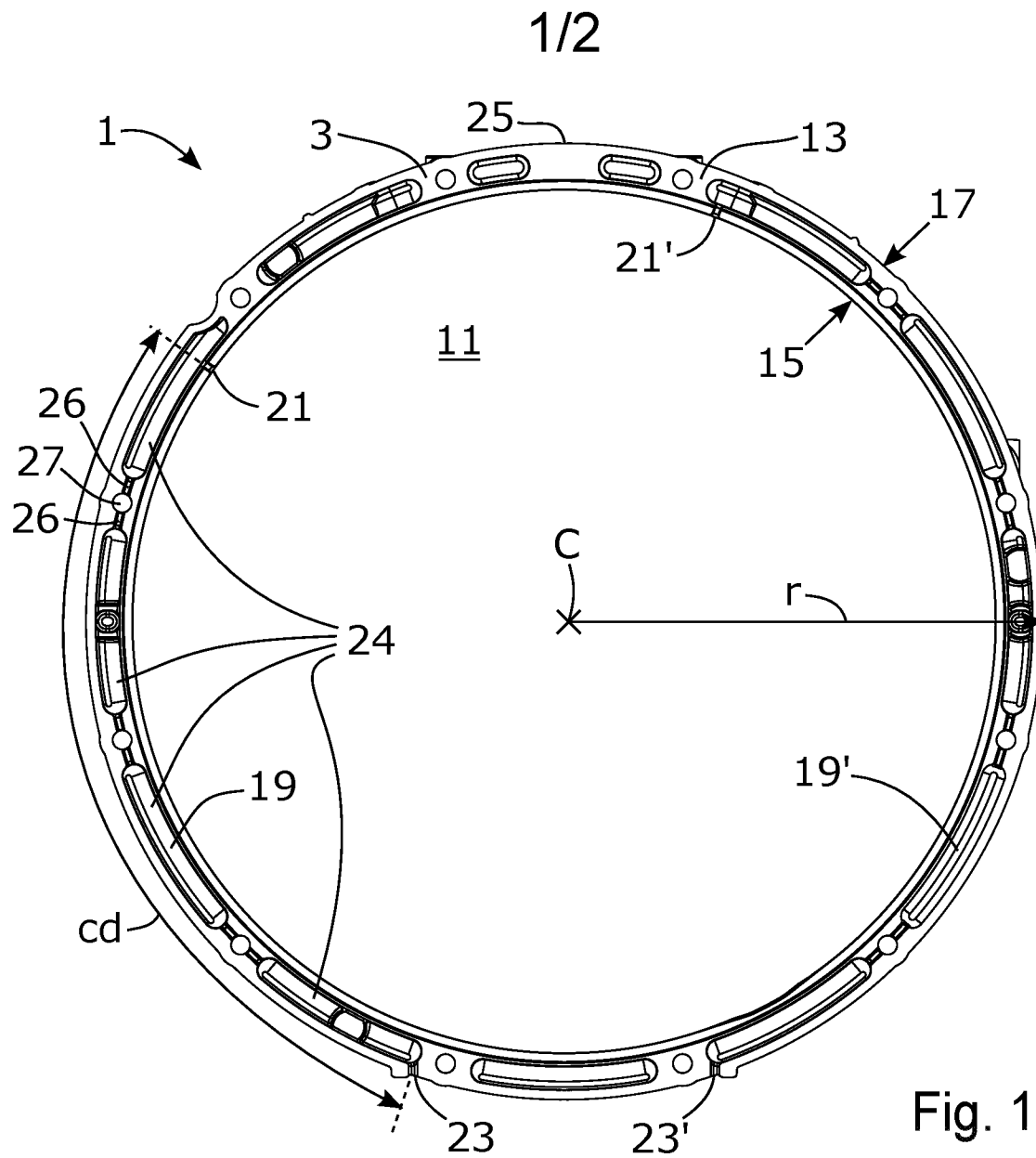
9. The transmission housing part (1) according to any one of the preceding claims, wherein the flange (3) comprises a second recess (19') extending along the flange surface (13), and wherein the flange surface (13) comprises a second inner groove (21') extending through the inner delimiting surface (15) into the second recess (19'), and a second outer groove (23') extending through the outer delimiting surface (17) into the second recess (19').

10. A transmission component (30) comprising a transmission housing part (1) and a second housing part (7) according to any one of the preceding claims.

11. The transmission component (30) according to claim 10, wherein the transmission component (30) is a clutch.

12. A power train (32) comprising a transmission component (30) according to claim 10 or 11.

13. A vehicle (40) comprising a power train (32) according to claim 12.



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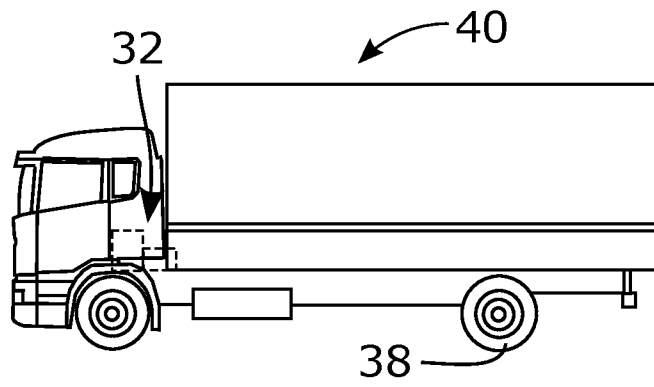


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2019/050845

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: F16H		
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		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 20100126306 A1 (ITO SHINJI ET AL), 27 May 2010 (2010-05-27); paragraphs [0003]-[0024], [0074]; figures 5,7 --	1-13
Y	JP 5922365 Y2 (TOYO KOGYO CO.), 4 July 1984 (1984-07-04); whole document; figures 1,2 --	1-13
A	EP 0059397 A2 (NISSAN MOTOR), 8 September 1982 (1982-09-08); page 2, line 21 - page 3, line 19; page 9, line 7 - page 13, line 13; figures 2-4; claim 1 --	1-13
A	US 4911035 A (TAGUCHI HIROMI), 27 March 1990 (1990-03-27); column 1, line 45 - column 2, line 4; figures 2-5; claim 1 --	1-13
☒ 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 "D" document cited by the applicant in the international application "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 25-11-2019	Date of mailing of the international search report 25-11-2019	
Name and mailing address of the ISA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86	Authorized officer Alexander Sakowitz Telephone No. + 46 8 782 28 00	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2019/050845

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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International Patent Classification (IPC)
F16H 57/027 (2012.01)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SE2019/050845

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