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(54) **Oil feeding system**

Ölzufuhrsystem

Système d'alimentation en huile

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FR-A- 2 196 004 FR-A1- 2 860 548
US-A- 1 866 280 US-B1- 6 260 534

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Description

TECHNICAL FIELD

[0001] The present invention concerns an oil feeding system suitable for an oil pump in a vehicle. The present invention also concerns an oil pump assembly.

BACKGROUND OF THE INVENTION

[0002] An oil pump in a vehicle is designed to supply pressurized oil to lubricate and cool parts of the vehicle's engine or transmission. Oil is, for example, supplied to a vehicle's pistons, so that they can slide easily in their cylinders, and to bearings that allow components like a vehicle's crankshaft and camshafts to rotate freely. In most vehicles, oil is sucked out of an oil pan, or oil sump, by an oil pump and then squirted under high pressure onto components such as cylinder walls and bearings. The oil then drains back down into the oil pan where it is collected again and the cycle repeats.

[0003] Conventional oil feeding systems for supplying oil to parts of a vehicle's engine or transmission comprise a feed pipe that extends from the oil pan to an oil pump. The oil inlet of the feed pipe is usually placed at the centre of the oil pan. Problems may occur when the oil level inside the oil pan temporarily falls below the oil inlet of the feed pipe due to the vehicle accelerating or decelerating (in which cases oil in the oil pan is displaced to the rear or to the front of the oil pan respectively), or due to the vehicle turning to the left or right (in which cases the oil in the oil pan is displaced to one side of the oil pan) or due to the vehicle tilting backwards, forwards or to the side when travelling along a sloping or uneven surface. When a vehicle is accelerating, decelerating, turning or tilting air may therefore be sucked up through the feed pipe instead of oil and a sufficient quantity of oil will consequently not be fed from the oil pan to the desired parts of the vehicle's engine or transmission.

[0004] This problem may be avoided by ensuring that the oil level in the oil pan is high enough so that air will not be sucked into an oil pump even when a vehicle is accelerating or decelerating, turning or tilting. A disadvantage with this solution is that a larger quantity of oil is needed to fill the oil pan, which increases service costs and means that the oil pan has to be made large and deep enough to hold the larger quantity of oil, which limits a vehicle manufacturer's design options, increases manufacturing costs and decreases the fuel efficiency of the vehicle (due to the increased weight of the oil pan and oil). Additionally, a lot of oil may splatter and hit the vehicle's crankshaft, raising the temperature of the oil and decreasing the performance of the vehicle at high engine speeds.

[0005] Furthermore, since an oil pan is often placed under an engine, if the oil pan is dimensioned to be deep and narrow, rather than shallow and wide, this may result in the vehicle having a lower aground clearance and/or

it may mean that the engine has to be placed higher up in the vehicle. A more highly placed engine raises the vehicle's centre of gravity and consequently decreases its stability, and it may also adversely affect the vehicle's aerodynamics (since a higher hood-line may be necessary), which results in reduced fuel efficiency and increased wind noise and buffeting.

[0006] The abstract of Japanese patent application no. JP 58093911 discloses an oil feeding device, for feeding oil from an oil pan to an oil pump, which comprises two suction ports located at the front and the rear of the oil pan. The end of each suction port is provided with a ball valve that comprises a dead weight that moves along a trough-shaped guide and that is opened and closed in accordance with the inclination of the oil level at each suction port end. When a vehicle in which the oil feeding device is mounted is travelling along a declined surface, oil is sucked only from the suction port at the front of the oil pan. A disadvantage with such an oil feeding device is that if the valve at the end of the suction port that should be feeding oil to the oil pump when the vehicle is tilted gets blocked, which is quite probable since impurities in the oil collect at the bottom the oil pan, oil may be completely prevented from flowing to the oil pump.

[0007] FR 2 860 547 concerns a power strainer for oil pump of thermal engine, which has two suction inlets placed respectively in two opposite portions of an oil pan. A longitudinal blocking chamber is connected to the inlets by two opposite longitudinal openings. Each opening connects the inlets that are situated in a direction opposite to the other opening. An inertial blocking unit blocks one opening with respect to the opposite opening.

[0008] FR 2 196 004 discloses a system for draining the liquid from a receptacle mounted in a vehicle. The system comprises a flow control means located between two fluid inlets, which is arranged to be automatically displaced by gravity to a position in which it allows fluid to flow through only one of the fluid inlets.

[0009] US 6 260 534 describes an oil-pickup system for an internal combustion engine, especially a one-cylinder diesel engine with at least three oil-pickup tubes which are in communication with the oil pump via a suction tube and which are disposed in an oil pan in such a way that, if the internal combustion engine is in inclined position, intake of air is prevented by the control valves associated with the oil-pickup tubes.

[0010] US 1 866 280 describes a combustion engine having a crank case and an oil pan secured beneath the crank case and a pump mounted in said pan and having a conduit at either end thereof extending to the opposite end of the pan, a port at the pump end of each of said conduits forming a valve seat and a ball valve operated by gravity on inclination of the pan to close the port corresponding to the conduit having least resistance.

SUMMARY OF THE INVENTION

[0011] An object of the present invention is to provide

an oil feeding system that effectively supplies oil to an oil pump that is mounted in a vehicle during all operating conditions of the vehicle, i.e. irrespective of whether the vehicle is accelerating, decelerating, turning or tilting.

[0012] This object is achieved by an oil feeding system according to claim 1, namely an oil feeding system for an oil pump in a vehicle, which system comprises a pair of feed pipes with each feed pipe having an oil inlet. The feed pipes are arranged to draw oil from an oil pan and feed it to an oil pump when the oil feeding system is mounted in a vehicle and in use. One feed pipe of said pair of feed pipe is arranged to draw oil from one part of the oil pan and the other feed pipe is arranged to draw oil from another part of the oil pan. The oil feeding system comprises a flow control means that is arranged downstream of the oil inlets. The flow control means is arranged to remain in a first position that allows oil to flow through either or both of the two feed pipes of when the vehicle is not accelerating, decelerating, turning or tilting. The flow control means is arranged to be displaced, as a direct or indirect consequence of the acceleration, deceleration, turning, or tilting of the vehicle, to a second position in which it allows oil to flow only through the feed pipe whose oil inlet is located in the part of the oil pan to which oil will be displaced during the acceleration, deceleration, turning or tilting of the vehicle and in which position it simultaneously blocks the flow of oil through the other feed pipe. The flow control means comprises a sliding valve, such as a piston, that is arranged to be displaced as a consequence of suction depressure that arises due to the displacement of oil in the oil pan during acceleration/deceleration/turning/tilting of the vehicle. Such an oil feeding system requires less oil in the oil pan to ensure that the feed pipes will supply oil (and not air) to the oil pump in a vehicle during all operating conditions of the vehicle.

[0013] It should be noted that the oil feeding system of the present invention is intended for use particularly, but not exclusively in a wet sump in which an oil pump sucks oil from an oil pan and then pumps it to parts of a vehicle's engine. The oil feeding system may equally be used in a dry sump. In a dry sump extra oil is stored in a tank outside the engine rather than in an oil pan under the engine. There are at least two oil pumps in a dry sump; one draws oil from the sump and sends it to the tank, and the other takes oil from the tank and sends it to lubricate the vehicle's engine. The minimum amount of oil possible remains in the engine. The expression "oil pan" in the appended claims is therefore intended to mean any oil container, which may be located anywhere in a vehicle and from which oil is drawn and fed to an oil pump.

[0014] According to an embodiment of the invention the oil inlets are arranged to be located on opposite parts or sides of the oil pan.

[0015] According to an embodiment of the invention the oil from one or both of the two feed pipes is ultimately arranged to be fed to the oil pump via a single pipe. The flow control means is for example arranged substantially

at the point where the two feed pipes merge into the single pipe, i.e. within 20 cm of that point, preferably within 10 cm of that point.

[0016] According to another embodiment of the invention the oil feeding system comprises a plurality of pairs of feed pipes. The oil feeding system may comprise a flow control means arranged to control the flow of oil through only one pair of feed pipes or a flow control means that is arranged to control the flow of oil through a plurality of pairs of feed pipes.

[0017] According to a further embodiment of the invention the flow control means is arranged to remain in the first position when the vehicle in which the oil feeding device is mounted is not accelerating/decelerating/turning/tilting *substantially* and is arranged to be displaced during *substantial* acceleration/deceleration/turning/tilting of the vehicle. The expression "substantial acceleration/deceleration/turning/tilting of the vehicle" is intended to mean an acceleration/deceleration/turning/tilting that will cause oil in the oil pan to be displaced to such an extent that one oil inlet will become located above the level of the oil. A vehicle manufacturer, knowing the size and shape of an oil pan and the level to which the oil pan will be filled during the operation of the vehicle, will of course be able to determine the magnitude of "substantial acceleration/deceleration/turning/tilting" and, on the basis of the present disclosure, construct the flow control means accordingly.

[0018] The present invention also concerns an oil pump assembly comprising an oil pump and an oil pan and an oil feeding system according to any of the embodiments of the invention for feeding oil from said oil pan to said oil pump.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The present invention will hereinafter be further explained by means of non-limiting examples with reference to the appended schematic figures where;

Figure 1 shows a known oil feeding system in a vehicle that is travelling along a substantially flat surface and that is not accelerating/decelerating,

Figure 2 shows the oil feeding system of figure 1 in a vehicle that is travelling along a substantially flat surface and that is accelerating/decelerating,

Figure 3 shows an oil feeding system according to an embodiment of the invention in a vehicle that is travelling along a substantially flat surface and that is not accelerating/decelerating,

Figure 4 shows the oil feeding system of figure 3 in a vehicle in a vehicle that is travelling along a substantially flat surface and that is acceler-

ating/decelerating,

Figure 5 shows a vehicle that is travelling along an inclined surface.

[0020] It should be noted that the drawings have not been drawn to scale and that the dimensions of certain features have been exaggerated for the sake of clarity.

DETAILED DESCRIPTION OF EMBODIMENTS

[0021] Figure 1 shows an oil feeding system 10 for an oil pump mounted in a vehicle that is travelling along a substantially flat surface. The oil pump may be a gear pump driven by the vehicle's camshaft or crankshaft. The oil feeding system 10 comprises two feed pipes 12 and 14 that each have an oil inlet 12a and 14a. The feed pipes 12 and 14 are arranged to draw oil 16 from the bottom of an oil pan 18 and feed it to an oil pump 20 when the oil feeding system 10 is mounted in a vehicle and in use. The oil pan 18 may be a detachable mechanism made out of steel and bolted to the bottom of the vehicle's crankcase. It may be molded into a deeper section and mounted at the bottom of a vehicle's crankcase to serve as an oil reservoir to maximize its function. One oil inlet 14a is arranged to be located on the N-side of the oil pan 18 and the other oil inlet 12a is arranged to be located on the S-side of the oil pan.

[0022] The oil feeding system 10 comprises a flow control means 22, for example two pistons 22a and 22c interconnected by a cross bar 22b which are arranged to be displaced inside a piston chamber 22d as a direct or indirect consequence of forces acting on the vehicle during the acceleration/deceleration or during the tilting of the vehicle when it is travelling along an inclined/declined/uneven surface. The flow control means 22 is arranged downstream of the oil inlets 12a and 14a at a point where the two feed pipes 12 and 14 merge into a single pipe 24. Figure 1 shows the flow control means 22 in a first position that allows oil 16 to flow through both of the feed pipes 12 and 14 when the vehicle is not accelerating/decelerating/tilting and when the oil level in the oil pan 18 is consequently substantially parallel to the bottom of the oil pan 18 when the vehicle is travelling along a substantially flat surface. In the first position, the body of each piston 22a and 22c is partly located in the piston chamber 22 and only partly obstructs the oil flowing through the feed pipes 12 and 14. Alternatively, the body of each piston could be arranged so as not to obstruct the oil flowing through the feed pipes 12 and 14 at all when the flow control means are in the first position. Furthermore, the flow control means 22 may be arranged to allow oil 16 to flow through just one of the feed pipes 12 and 14 when the vehicle is not accelerating/decelerating/tilting and when the flow control means 22 are in the first position.

[0023] The oil pan 18 has a volume of 3-7 litres, the pistons 22a and 22c have a diameter of 2-7 cm, and the pistons 22a and 22c and the connecting rod 22b have a

total weight of 200-500 g. The dimensions of the components of the oil feeding system will however vary depending on its application.

[0024] Figure 2 shows the oil feeding system 10 of figure 1 with the flow control means 22 in a second position after the flow control means 22 has been displaced in the direction of arrow 26 in figure 2 as a direct consequence of acceleration of the vehicle. Since the oil 16 in the oil pan 18 is subjected to the same forces as the flow control means 22, the flow control means 22 may be arranged to move simultaneously with the oil 16. The flow control means 22 has for example been automatically displaced by forces acting on the vehicle during its acceleration. In this second position the flow control means 22 allows oil 16 to flow only through the feed pipe 12 that has an oil inlet 12a located on the S-side of the oil pan 18 to which most oil 16 will be displaced during the acceleration of the vehicle.

[0025] When the flow control means 22 is in the position shown in figure 2 it blocks the flow of oil 16 through the feed pipe 14 whose oil inlet 14a is located on the N-side of the oil pan 18 since in the second position the body of piston 22c blocks all oil flowing through feed pipe 14 whereas the body of piston 22a is located entirely in the piston chamber and does not obstruct oil flowing through feed pipe 12 at all. Once the vehicle stops accelerating the oil 16 in the oil pan 18 will return to the position shown in figure 1. The flow control means 22 will simultaneously be displaced back to its first position as shown in figure 1 and oil 16 will then be drawn from both feed pipes 12 and 14. Should the vehicle decelerate or travel along a declining surface, the flow control means 22 will be displaced in the direction of arrow 28 in figure 2.

[0026] Figures 3 and 4 show an oil feeding system according to an embodiment of the invention in which the flow control means is arranged to be displaced as a consequence of suction depressure that arises in one of the feed pipes due to the displacement of oil in the oil pan during acceleration/deceleration/tilting of the vehicle. In the illustrated embodiment channels 22e and 22f connect the ends of the piston chamber 22d with the feed pipes 12 and 14 respectively, to transmit any depressure generated in the feed pipes 12 and 14.

[0027] Figure 3 shows the position of the flow control means 22 in the piston chamber 22d when the vehicle in which the oil feeding system 10 is mounted is not accelerating/decelerating or tilting and thus when the suction depressure in both feed pipes 12 and 14 is substantially the same. When the vehicle accelerates, oil 16 in the oil pan 18 will be displaced to the S-side of the oil pan 18 as shown in figure 4. Since the oil inlet 14a located at the N-side of the oil pan 18 will start to suck air (and not oil) into the feed pipe 14, less depressure will occur in that feed pipe 14, causing the flow control means 22 to move towards the suction pipe with the most depressure (the S-side to which most oil has been displaced). This will cause piston 22c to block the feed pipe 14 if air is sucked into its oil inlet 14a.

[0028] Figure 5 shows a passenger car 30 travelling along an inclined surface 32. The car 30 comprises an engine whose position is indicated by the dashed line 34 in figure 5. The engine 34 comprises at least one oil feeding system according to an embodiment of the present invention (not shown). The car 30 also comprises an ECU 36 that contains computer program code means arranged to cause a computer or a processor to determine whether the vehicle is accelerating/decelerating/turning/tilting at a rate/angle that exceeds a predetermined rate/angle, by analyzing data from an accelerometer or other sensors for example, and/or to send a signal to actuator means 38 that are arranged to displace the flow control means 22 of the oil feeding system accordingly.

[0029] Further modifications of the invention would be apparent to a skilled person. For example, although the claims are directed to an oil feeding system, it would be apparent to the skilled person that such a system could be used for feeding any liquid to any pump that is mounted in a vehicle. The inventive system could for example be used to supply a mixture of water and ethylene glycol (anti-freeze) to a pump that pumps said mixture to a radiator that is connected to channels running through a vehicle's engine and cylinder head, or to supply cleaning fluid to a windscreen washer pump.

Claims

1. Oil feeding system (10) for an oil pump (20) in a vehicle (30), which system comprises a pair of feed pipes (12, 14) with each feed pipe having an oil inlet (12a, 14a), the feed pipes being arranged to draw oil (16) from an oil pan (18) and feed it to an oil pump (20) when the oil feeding system (10) is mounted in a vehicle (30) and in use, whereby one feed pipe (12) of said pair of feed pipes is arranged to draw oil from one part (S) of the oil pan (18) and the other feed pipe (14) is arranged to draw oil from another part (N) of the oil pan (18), whereby

- the oil feeding system comprises a flow control means (22) that is arranged downstream of said oil inlets (12a, 14a),
- whereby the flow control means (22) is arranged to remain in a first position that allows oil to flow through both or either of said two feed pipes (12, 14) when said vehicle (30) is not accelerating/decelerating/turning/tilting and

said flow control means (22) is arranged to be displaced, as a direct or indirect consequence of acceleration/deceleration/turning/tilting of said vehicle (30), to a second position in which it allows oil to flow only through the feed pipe (12) whose oil inlet (12a) is located in the part of the oil pan (18) to which oil will be displaced during acceleration/deceleration/turning/tilting of said vehicle (30) and in which

position it simultaneously blocks the flow of oil through the other feed pipe (14), **characterized in that** said flow control means (22) comprises a sliding valve, such as a piston, that is arranged to be displaced as a consequence of suction depressure that arises due to the displacement of oil (16) in the oil pan (18) during acceleration/deceleration/turning/tilting of said vehicle (30).

2. Oil feeding system (10) according to claim 1, **characterized in that** said flow control means (22) comprise two pistons (22a, 22c) that are interconnected by a crossbar (22b) and which are arranged to be displaced in a piston chamber (22d).
3. Oil feeding system (10) according to any of the preceding claims, **characterized in that** said oil inlets (12a, 14a) are arranged to be located on opposite parts or sides (N, S) of the oil pan (18).
4. Oil feeding system (10) according to any of the preceding claims, **characterized in that** the oil from one or both of said two feed pipes (12, 14) is ultimately arranged to be fed to said oil pump (20) via a single pipe (24).
5. Oil feeding system (10) according to claim 4, **characterized in that** said flow control means (22) is arranged substantially at a point where said two feed pipes (12, 14) merge into said single pipe (24).
6. Oil feeding system (10) according to any of the preceding claims, **characterized in that** it comprises a plurality of pairs of feed pipes (12, 14).
7. Oil feeding system (10) according to claim 6, **characterized in that** it comprises a plurality of flow control means (22), whereby each flow control means is arranged to control the flow of oil through only one pair of feed pipes (12, 14).
8. Oil feeding system (10) according to claim 6, **characterized in that** it comprises a flow control means (22) that is arranged to control the flow of oil through a plurality of pairs of feed pipes (12, 14).
9. Oil feeding system (10) according to any of the preceding claims, **characterized in that** the flow control means (22) is arranged to remain in said first position when said vehicle (30) is not accelerating/decelerating/turning/tilting substantially and is arranged to be displaced during substantial acceleration/deceleration/turning/tilting of said vehicle (30).
10. Oil pump assembly comprising an oil pump (20) and an oil pan (18), **characterized in that** it comprises an oil feeding system (10) according to any of the preceding claims for feeding oil from said oil pan (18)

to said oil pump (20).

Patentansprüche

1. Ölzufuhrsystem (10) für eine Ölpumpe (20) in einem Fahrzeug (30), wobei das System ein Paar Zufuhrrohre (12, 14) umfasst, wobei jedes Zufuhrrohr einen Öleinlass (12a, 14a) besitzt, wobei die Zufuhrrohre dafür ausgelegt sind, Öl (16) aus einer Ölwanne (18) zu saugen und es einer Ölpumpe (20) zuzuführen, wenn das Ölzufuhrsystem (10) in einem Fahrzeug (30) montiert und in Gebrauch ist, wobei ein Zufuhrrohr (12) des Paares Zufuhrrohre dafür ausgelegt ist, Öl aus einem Teil (S) der Ölwanne (18) zu saugen, und das andere Zufuhrrohr (14) dafür ausgelegt ist, Öl aus einem weiteren Teil (N) der Ölwanne (18) zu saugen, wobei

- das Ölzufuhrsystem ein Durchflussssteuermit-
tel (22) umfasst, das stromabseitig der Öleinläs-
se (12a, 14a) angeordnet ist,
- wobei das Durchflussssteuermit-
tel (22) dafür
ausgelegt ist, in einer ersten Position zu bleiben,
die ermöglicht, dass Öl entweder durch beide
Zufuhrrohre (12, 14) oder durch eines von ihnen
fließt, wenn das Fahrzeug (30) keiner Beschleu-
nigung/Verzögerung/Kurvenfahrt/Neigung un-
terliegt, und

wobei das Durchflussssteuermit-
tel (22) dafür ausge-
legt ist, als direkte oder indirekte Folge einer Be-
schleunigung/Verzögerung/Kurvenfahrt/Neigung
des Fahrzeugs (30) in eine zweite Position verlagert
zu werden, in der es ermöglicht, dass Öl nur durch
das Zufuhrrohr (12) fließt, dessen Öleinlass (12a)
sich in dem Teil der Ölwanne (18) befindet, in den
Öl während der Beschleunigung/Verzögerung/Kur-
venfahrt/Neigung des Fahrzeugs (30) verlagert wird,
wobei es in dieser Position gleichzeitig die Strömung
des Öls durch das andere Zufuhrrohr (14) blockiert,
dadurch gekennzeichnet, dass das Durchflus-
steuermit-
tel (22) ein Gleitventil wie etwa einen Kol-
ben umfasst, der dafür ausgelegt ist, als Folge eines
Saugunterdrucks, der aufgrund der Verlagerung von
Öl (16) in der Ölwanne (18) während der Beschleu-
nigung/Verzögerung/Kurvenfahrt/Neigung des
Fahrzeugs (30) entsteht, verlagert zu werden.

2. Ölzufuhrsystem (10) nach Anspruch 1, **dadurch ge-
kennzeichnet, dass** das Durchflussssteuermit-
tel (22) zwei Kolben (22a, 22c) umfasst, die durch einen
Querstab (22b) miteinander verbunden sind und die
dafür ausgelegt sind, in einer Kolbenkammer (22d)
verlagert zu werden.
3. Ölzufuhrsystem (10) nach einem der vorhergehen-
den Ansprüche, **dadurch gekennzeichnet, dass**

die Öleinlässe (12a, 14a) dafür ausgelegt sind, an
gegenüberliegenden Teilen oder Seiten (N, S) der
Ölwanne (18) angeordnet zu sein.

4. Ölzufuhrsystem (10) nach einem der vorhergehen-
den Ansprüche, **dadurch gekennzeichnet, dass**
das Öl von einem oder beiden Zufuhrrohren (12, 14)
letztlich über ein einziges Rohr (24) der Ölpumpe
(20) zugeführt werden soll.
5. Ölzufuhrsystem (10) nach Anspruch 4, **dadurch ge-
kennzeichnet, dass** das Durchflussssteuermit-
tel (22) im Wesentlichen an einem Punkt angeordnet
ist, an dem die beiden Zufuhrrohre (12, 14) in ein
einziges Rohr (24) übergehen.
6. Ölzufuhrsystem (10) nach einem der vorhergehen-
den Ansprüche, **dadurch gekennzeichnet, dass** es
mehrere Paare Zufuhrrohre (12, 14) umfasst.
7. Ölzufuhrsystem (10) nach Anspruch 6, **dadurch ge-
kennzeichnet, dass** es mehrere Durchflussssteuer-
mittel (22) umfasst, wobei jedes Durchflussssteuer-
mittel dafür ausgelegt ist, den Fluss von Öl durch nur
ein Paar Zufuhrrohre (12, 14) zu steuern.
8. Ölzufuhrsystem (10) nach Anspruch 6, **dadurch ge-
kennzeichnet, dass** es ein Durchflussssteuermit-
tel (22) umfasst, das dafür ausgelegt sind, den Fluss
von Öl durch mehrere Paare Zufuhrrohre (12, 14) zu
steuern.
9. Ölzufuhrsystem (10) nach einem der vorhergehen-
den Ansprüche, **dadurch gekennzeichnet, dass**
das Durchflussssteuermit-
tel (22) dafür ausgelegt ist, in der ersten Position zu bleiben, wenn das Fahrzeug
(30) im Wesentlichen keiner Beschleunigung/Verzö-
gerung/Kurvenfahrt/Neigung unterliegt, und dafür
ausgelegt ist, während einer wesentlichen Be-
schleunigung/Verzögerung/Kurvenfahrt/Neigung
des Fahrzeugs (30) verlagert zu werden.
10. Ölpumpenanordnung, die eine Ölpumpe (20) und ei-
ne Ölwanne (18) umfasst, **dadurch gekennzeich-
net, dass** sie ein Ölzufuhrsystem (10) nach einem
der vorhergehenden Ansprüche umfasst, um Öl von
der Ölwanne (18) der Ölpumpe (20) zuzuführen.

Revendications

1. Système d'alimentation (10) en huile pour une pom-
pe (20) à huile dans un véhicule (30), lequel système
comportant une paire de tuyaux d'alimentation (12,
14), chaque tuyau d'alimentation ayant une entrée
(12a, 14a) d'huile, les tuyaux d'alimentation étant
conçus pour extraire de l'huile (16) d'un carter (18)
d'huile et la fournir à une pompe (20) à huile quand

le système d'alimentation (10) en huile est monté dans un véhicule (30) et en service, un premier tuyau d'alimentation (12) de ladite paire de tuyaux d'alimentation étant conçu pour extraire de l'huile d'une première partie (S) du carter (18) d'huile et l'autre tuyau d'alimentation (14) étant conçu pour extraire de l'huile d'une autre partie (N) du carter (18) d'huile, dans lequel

- le système d'alimentation en huile comprend un moyen de régulation d'écoulement (22) disposé en aval desdites entrées (12a, 14a) d'huile,
- le moyen de régulation d'écoulement (22) est conçu pour rester dans une première position qui permet un écoulement d'huile dans les deux ou dans l'un ou l'autre desdits deux tuyaux d'alimentation (12, 14) lorsque ledit véhicule (30) n'est pas en train d'accélérer/ralentir/tourner/s'incliner, et

ledit moyen de régulation d'écoulement (22) est conçu pour être déplacé, directement ou indirectement par suite de l'accélération/ralentissement/braquage/inclinaison dudit véhicule (30), jusqu'à une seconde position dans laquelle il ne permet un écoulement d'huile que dans le tuyau d'alimentation (12) dont l'entrée (12a) d'huile se trouve dans la partie du carter (18) d'huile vers lequel de l'huile sera déplacé pendant l'accélération/ralentissement/braquage/inclinaison dudit véhicule (30), position dans laquelle il empêche simultanément l'écoulement d'huile dans l'autre tuyau d'alimentation (14), **caractérisé en ce que** ledit moyen de régulation d'écoulement (22) comprend une soupape à tiroir, telle qu'un piston, conçue pour être déplacée du fait de la dépression d'aspiration créée par suite du déplacement de l'huile (16) dans le carter (18) d'huile pendant l'accélération/ralentissement/braquage/inclinaison dudit véhicule (30).

2. Système d'alimentation (10) en huile selon la revendication 1, **caractérisé en ce que** ledit moyen de régulation d'écoulement (22) comprend deux pistons (22a, 22c) reliés l'un à l'autre par une barre transversale (22b) et conçus pour être déplacés dans une chambre (22d) de pistons.
3. Système d'alimentation (10) en huile selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdites entrées (12a, 14a) d'huile sont disposées de manière à se trouver sur des parties ou des côtés opposés (N, S) du carter (18) d'huile.
4. Système d'alimentation (10) en huile selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'huile d'un seul ou des deux dits tuyaux d'alimentation (12, 14) est finalement desti-

née à être fournie à ladite pompe (20) à huile via un tuyau unique (24).

5. Système d'alimentation (10) en huile selon la revendication 4, **caractérisé en ce que** ledit moyen de régulation d'écoulement (22) est disposé sensiblement à un endroit où lesdits deux tuyaux d'alimentation (12, 14) se fondent dans ledit tuyau unique (24).
6. Système d'alimentation (10) en huile selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comporte une pluralité de paires de tuyaux d'alimentation (12, 14).
7. Système d'alimentation (10) en huile selon la revendication 6, **caractérisé en ce qu'il** comporte une pluralité de moyens de régulation d'écoulement (22), chaque moyen de régulation d'écoulement étant conçu pour réguler l'écoulement d'huile dans une seule paire de tuyaux d'alimentation (12, 14).
8. Système d'alimentation (10) en huile selon la revendication 6, **caractérisé en ce qu'il** comporte un moyen de régulation d'écoulement (22) conçu pour réguler l'écoulement d'huile dans une pluralité de paires de tuyaux d'alimentation (12, 14).
9. Système d'alimentation (10) en huile selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le moyen de régulation d'écoulement (22) est conçu pour rester dans ladite première position lorsque ledit véhicule (30) n'est pas en train d'accélérer/ralentir/tourner/s'incliner fortement et est conçu pour être déplacé pendant l'accélération/ralentissement/braquage/inclinaison fort(e) dudit véhicule (30).
10. Système de pompe comportant une pompe (20) à huile et un carter (18) d'huile, **caractérisé en ce qu'il** comporte un système d'alimentation (10) en huile selon l'une quelconque des revendications précédentes pour transférer de l'huile dudit carter (18) d'huile vers ladite pompe (20) à huile.

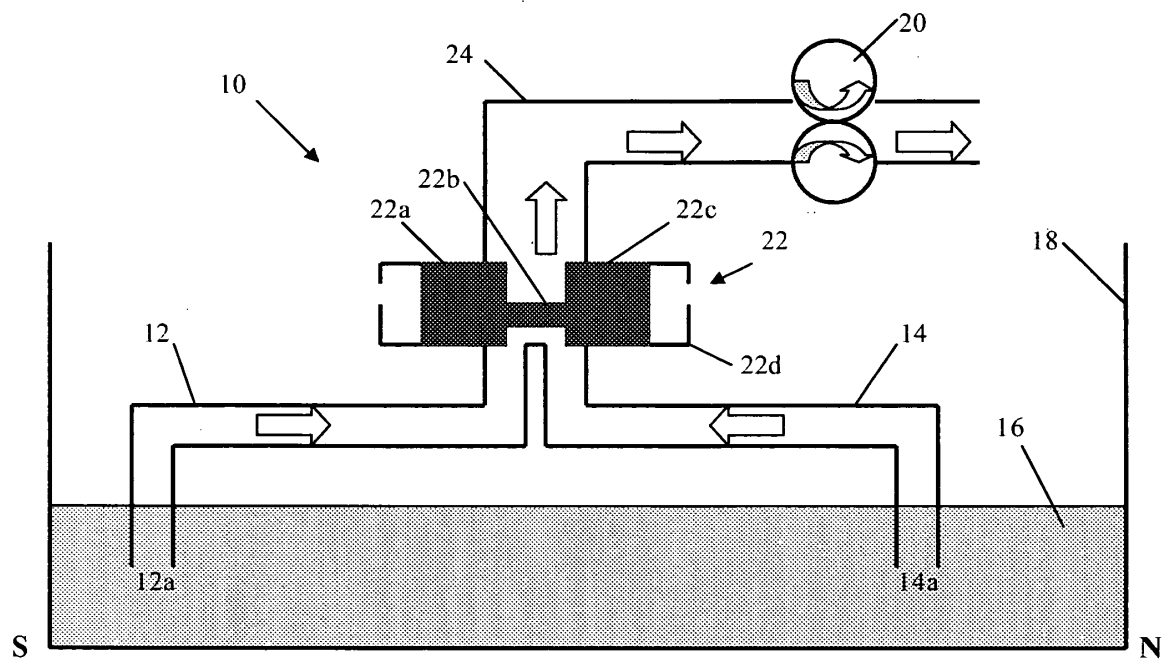


Fig. 1

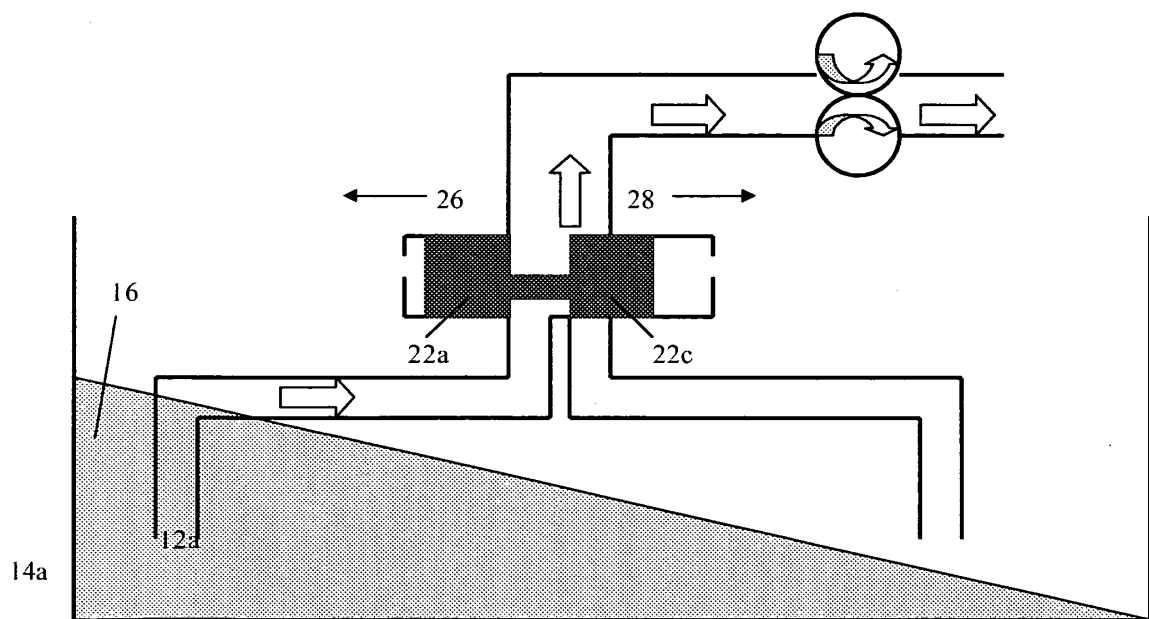


Fig. 2

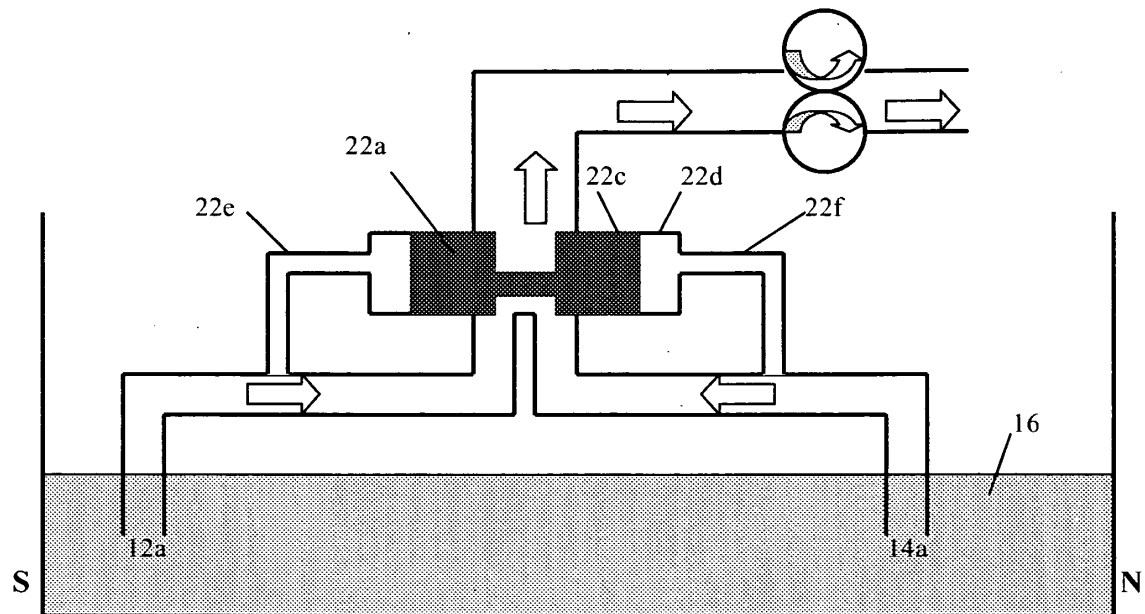


Fig. 3

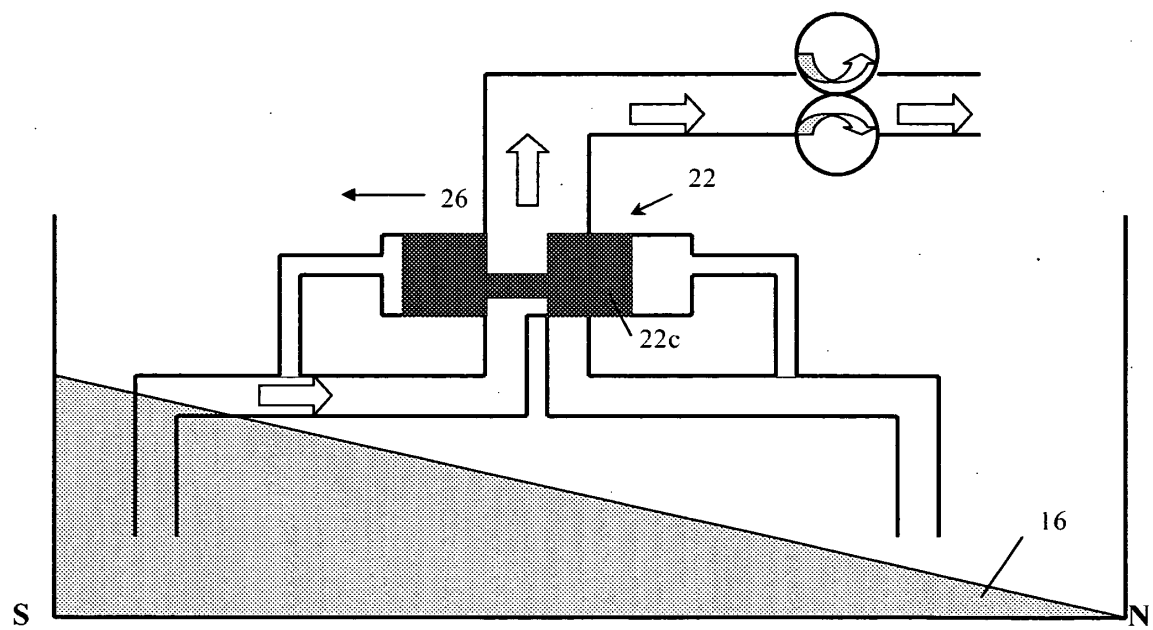


Fig. 4

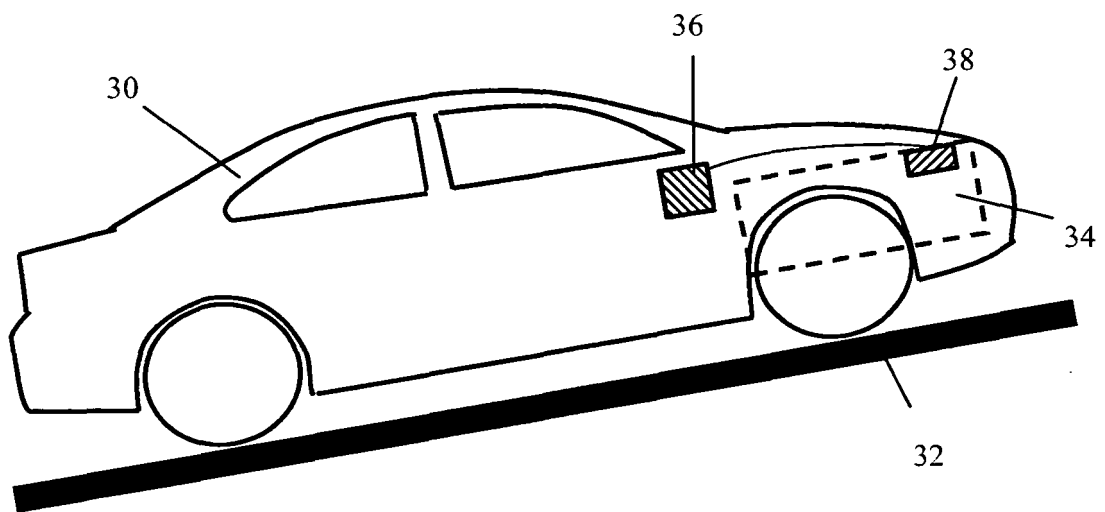


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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