In oil pump cover for a motor vehicle oil pump is provided that includes, but is not limited to a cover for covering a part of the motor vehicle oil pump. The oil pump cover further includes, but is not limited to an oil suction channel which can be connected to the interior of the motor vehicle oil pump. The oil suction channel is designed in one piece with the cover. The oil suction channel is designed in such a manner that a suction opening for suction of oil in the built-in state is disposed adjacent to a lower base of an oil pan. Manufacture and assembly is simplified through this simplified one-piece structure of the oil pump cover.
OIL PUMP COVER
CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to German Patent Application No. 102007049848.8, filed Oct. 18, 2007, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The technical field relates to an oil pump cover for a motor vehicle oil pump, with the aid whereof, for example, a housing of the motor vehicle oil pump can be closed in order to protect the pump system disposed inside the housing from environmental influences.

[0003] A motor vehicle oil pump disposed in an oil pan of an internal combustion engine, having an oil pump cover is known from DE 196 30 545 A1. A tubular attachment projects from the oil pump cover, to which an oil suction channel is flange-mounted with the aid of a plurality of screws. The oil suction channel consists of a bent tube, whose suction opening ends in an oil suction cage for the suction of oil, which is disposed in a lower base of an oil pan.

[0004] A disadvantage with such an oil pump cover is that the manufacture and assembly is time-consuming so that the production of the internal combustion engine is more expensive.

[0005] It is therefore at least one object to provide an oil pump cover which can be manufactured more easily and which can be mounted more easily. In addition, other objects, desirable features, and characteristics will become apparent from the subsequent summary and detailed description, and the appended claims, taken in conjunction with the accompanying drawings and this background.

SUMMARY

[0006] The at least one object, other objects, desirable features, and characteristics, are achieved with the oil pump cover according an embodiment of the invention for a motor vehicle oil pump comprises a cover, with the aid whereof a part of the motor vehicle oil pump can be covered. For example, the cover can be connected to a housing to protect a pumping system from environmental influences. The oil pump cover further comprises an oil suction channel, which can be connected to the interior of the motor vehicle oil pump, for example, in order to supply a pump system of the motor vehicle oil pump with oil. According to the invention, the oil suction channel is designed in one piece with the cover. The oil suction channel is designed in such a manner that a suction opening for suction of oil in the built-in state is disposed adjacent to a lower base of an oil pan.

[0007] Since the oil suction channel is designed as a one-piece component with the cover being of such a length that it reaches as far as the lower base of the oil pan, it is not necessary to connect an oil suction channel as a separate component to the cover. The need for flange-mounting the oil suction channel is eliminated to that assembly can be carried out more rapidly and more simply. The assembly of an internal combustion engine in which such an oil pump cover is used, can thereby be accomplished more rapidly and more cost-effectively. Furthermore, the one-piece structure avoids a connecting surface between the oil suction channel and the cover so that it is not necessary to provide a seal, thereby improving the manufacture. Additional components are avoided and the probability of leaks occurring is appreciably reduced.

[0008] The oil suction channel preferably tapers from the suction opening toward the cover. In particular, the tapering is effected conically or in the form of an oblique truncated cone. Since a larger cross section is thus obtained in the area of the suction opening than in the area of the cover, in which the oil suction channel goes over into the interior of the motor vehicle oil pump, comparatively low flow rates for the pumped oil are obtained in the area of the suction opening. As a result of the lower flow rates, swirling of deposited particles or suspended matter is avoided, so that the risk of unintentionally pumping suspended matter is reduced. This makes it possible to dispense with filters or separators.

[0009] The cover can have connecting openings by which means the cover can be fastened to the motor vehicle oil pump, for example, by means of screws. In particular, the cover can have a receiving opening by which means in particular a pump shaft can be received and/or mounted. The pump shaft, by which means in particular the pump system of the motor vehicle oil pump can be driven, is additionally supported by the fastened cover.

[0010] Particularly preferably, the oil pump cover can be produced by casting, in particular by compression casting. In particular, if the oil suction channel is designed substantially conically, the oil suction channel can be manufactured particularly simply by a core during casting. This makes it possible to provide a substantially flat cover with a particularly long oil suction channel during forming. The ratio of the average length of the oil suction channel to the height of the cover in the built-in state is in particular about 1.0 to 5.0, preferably about 1.5 to 3.0, and particularly preferably about 1.5 to 2.0.

[0011] The embodiments of the invention further provide for a motor vehicle oil pump, which the aid whereof oil can be supplied to an internal combustion engine of a motor vehicle. The motor vehicle oil pump comprises a housing, which can be closed by an oil pump cover, which as described hereinbefore can be developed and further developed. A pump system is disposed in the interior of the motor vehicle oil pump, with the aid whereof oil can be pumped. In the built-in state, the pump system is surrounded by the housing and the oil pump cover. Since, as a result of the oil pump cover, it is not necessary to flange-mount a separate oil suction channel to the motor vehicle oil pump, the motor vehicle oil pump can be manufactured or mounted rapidly and cost-effectively, and in particular, can be connected as a dedicated module to an oil pan of an internal combustion engine.

[0012] In particular, an oil sump for receiving oil is formed by the housing and/or the cover, through which a pump wheel of the pump system can be moved. As a result of this configuration, the pump wheel can be supplied with oil on both front sides so that the pump wheel can be provided with chambers for conveying oil on both sides to enhance the pump capacity.

[0013] The oil suction channel is particularly preferably connected to the interior of the motor vehicle oil pump at the geodesically substantially lowest position in the built-in state. This avoids any deposition of suspended matter inside the motor vehicle oil pump since, on switching off the motor vehicle oil pump, the suspended matter passes via the oil suction channel into the oil pan and does not remain inside the housing.
The embodiments of the invention further provide for an oil pan arrangement comprising an oil pan for an internal combustion engine of a motor vehicle. The oil pan arrangements comprises an oil pump cover which can be developed and further developed as described hereinbefore and/or a motor vehicle oil pump which can be developed and further developed as described hereinbefore. The oil pan has a lower base at the geodesically substantially lowest point, to which the suction opening of the oil suction channel is adjacent disposed. The oil suction channel of the oil pump cover thus extends substantially as far as the lowest position of the oil pan. The distance between the suction opening and the lower base is about 0.1 cm to about 5.0 cm, in particular about 0.2 cm to about 4.0 cm, preferably about 0.3 cm to about 3.0 cm, more preferably about 0.4 cm to about 2.0 cm, and especially preferably about 0.5 cm to about 1.0 cm.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will hereinafter be described in conjunction with the following drawing figures, wherein like numerals denote like elements, and

FIG. 1 shows a schematic perspective view of the oil pump cover according to an embodiment of the invention,

FIG. 2 shows a schematic sectional view of the oil pump cover from FIG. 1.

FIG. 3 shows a schematic perspective view of a partially mounted motor vehicle oil pump; and

FIG. 4 shows a schematic sectional view of an oil pan arrangement with the motor vehicle oil pump from FIG. 3.

DETAILED DESCRIPTION

The following detailed description is merely exemplary in nature and is not intended to limit the invention application and uses. Furthermore, there is no intention to be bound by any theory presented in the preceding summary or background or the following detailed description.

The oil pump cover 10 shown in FIG. 1 comprises a cover 12 and an oil suction channel 14 connected in one piece to the cover 12. The cover 12 further has a receiving opening 16 for supporting a pump shaft of a pump system, not shown. The cover 12 further comprises a plurality of connecting openings 18, by which means the oil pump cover 10 can be screwed tightly to a housing 20. The oil suction channel 14 has a suction opening 22 for sucking oil, which, on account of the conical configuration of the oil suction channel 14, is larger than a transition opening 24 to the interior of a motor vehicle oil pump 26 (FIG. 2).

In the motor vehicle oil pump 26 shown partly in FIG. 3, the oil pump cover 10 is connected to a part of a housing 20. The interior of the motor vehicle oil pump 26 is enclosed by the housing 20 together with the cover 12 of the oil pump cover, in order to accommodate a pump system.

In the oil pan arrangement 28 shown in FIG. 4, the motor vehicle oil pump 26 with the oil pump cover 10 is inserted from above into an oil pan 30 and connected thereto. At its lowest point, the oil pan 30 has a lower base 32, in the region whereof the oil suction channel 14 extends, so that the suction opening 22 is disposed at only a short distance from the lower base 32.

An oil sump 34 is formed by the oil pump cover 10 and the housing 20, through which a pump wheel of the pump system can move. The transition opening 24 of the oil suction channel 14 goes over into the interior of the motor vehicle oil pump 26 at the lowest point of the motor vehicle oil pump 26 so that no suspended matter and solids can deposit in the oil sump 34.

While at least one exemplary embodiment has been presented in the foregoing summary and detailed description, it should be appreciated that a vast number of variations exist. It should also be appreciated that the exemplary embodiment or exemplary embodiments are only examples, and are not intended to limit the scope, applicability, or configuration in any way. Rather, the summary and foregoing detailed description will provide those skilled in the art with a convenient roadmap for implementing an exemplary embodiment, it being understood that various changes may be made in the function and arrangement of elements described in an exemplary embodiment without departing from the scope as set forth in the appended claims and their legal equivalents.