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[Continued on next page]

(54) Title: A SUPERCHARGER FOR AN ENGINE

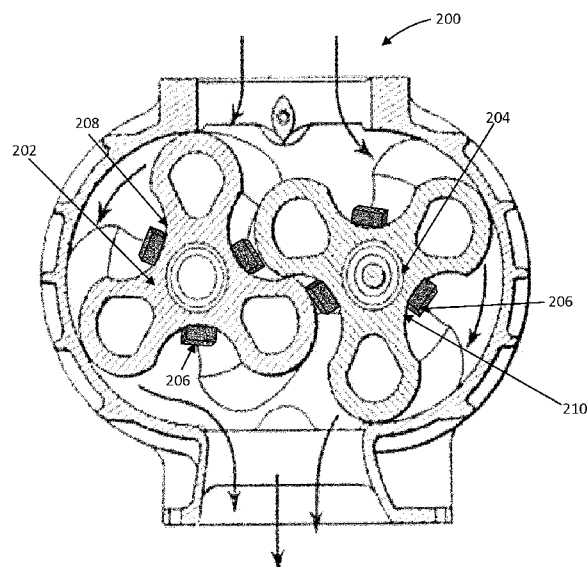


FIG. 2

(57) Abstract: Disclosed herein is a supercharger (200) for an engine (102). The supercharger (200) is located along the inlet to an engine (102) and has a first rotatable member (202) and a second rotatable member (204). The supercharger (200) is adapted to receive exhaust from an engine (102) along with atmospheric air and is provided with a cleaning material (206). The cleaning material (206) is provided in a manner such that the first rotatable member (202) and the second rotatable member (204) in the supercharger (200) contacts the cleaning material (206).



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

- 1 -

5 Description**TITLE**A Supercharger for an Engine**10 Field of the invention**

This invention relates to the field of supercharger for an engine.

Background of the invention

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Superchargers are used to increase the power generated by an engine. Superchargers use a compressor to increase the pressure or density of air supplied to an engine.

Superchargers are powered mechanically by belt or chain-drive from the engine's crankshaft. In order to increase the performance of the supercharger there is a need to allow
20 the supercharger to have an additional source of input in addition to atmospheric air. The other source of air, a supercharger may have access to is, the exhaust from the engine. But, the exhaust from the engine cannot be used directly as the impurities present in the exhaust may cause damage to the components to the supercharger. Hence, there is also a need for a purification mechanism before the air and/ or exhaust enters the supercharger.

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Prior art patent application US8099957 supercharger compressor includes a plurality of rotors rotatably mounted in a housing, a first inlet for air, a second inlet for recirculated exhaust gas, and a flow separator. The flow separator is arranged interior the housing and configured to form a slideable seal with at least one rotor of the plurality of rotors, the slide
30 able seal fluidically isolating the first inlet from the second inlet, at least in part, and retarding pressure equalization there between.

– 2 –

Brief description of the accompanying drawing

Different modes of the invention are disclosed in detail in the description and illustrated in the accompanying drawing:

5

FIG. 1 illustrates a supercharger for an engine; and

FIG. 2 illustrates a supercharger provided with a cleaning material.

10 Detailed description of the embodiments

FIG. 1 illustrates a supercharger (200) for an engine (102). The supercharger (200) disclosed herein derives power from the engine (102) crankshaft. During working, the supercharger (200) takes in air, and exhaust, which is re-circulated from the exhaust gas recirculation valve (EGR) (104) and compresses it to a pressure that is greater than atmospheric pressure. The result is more air is forced into the engine (102). The engine (102) now has the ability to draw in more fuel, corresponding to increase in the volume of air supplied and thereby increasing the charge supplied for combustion. This increases the power developed by the engine (102). The exhaust gas that reaches the supercharger (200) is filled with dust and carbon deposits and this needs to be purified before it is sent back to the engine (102) along with the atmospheric air. This is achieved with the help of cleaning material (206) that will be described in the detailed description of Fig. 2.

FIG. 2 illustrates a supercharger (200) provided with a cleaning material (206). The supercharger (200) may be a roots type supercharger (200). The supercharger (200) is located along the inlet to an engine (102) and has a first rotatable member (202) and a second rotatable member (204). The first rotatable member (202) and the second rotatable member (204) are mounted on a shaft that derives power from the crankshaft of the engine (102) with the help of a drive. The first rotatable member (202) and the second rotatable member (204) rotate along respective axis of the shaft on which they are mounted. The supercharger (200) is adapted to receive recirculated exhaust from an engine (102) along with fresh air and is provided with a cleaning material (206). The cleaning material (206) is

– 3 –

provided in a manner such that at least a part of the first rotatable member (202) and at least a part of the second rotatable member (204) in the supercharger (200) contacts the cleaning material (206). The profile of the first rotatable member (202) and the second rotatable member (204) is such that the cleaning material (206) can be easily adapted onto the same. At least a part of the first rotatable member contacts the cleaning material (206) provided on the second rotatable member (204). At least a part of the second rotatable member (204) contacts the cleaning material (206) provided on the first rotatable member (202).

An interlobe trough is formed at the region where the blades of the rotatable member meet. As seen from FIG. 2 an interlobe trough is depression created in between the blades of the first rotatable member and the second rotatable member. The first rotatable member (202) will be in contact with the cleaning material (206) provided on the interlobe trough (210) of the second rotatable member (204) and vice-versa. The exhaust that is received via the EGR valve (104) is sucked into the supercharger (200) due to rotation of the first rotatable member (202) and the second rotatable member (204), due to this sucking action the exhaust gas particulates get deposited on the cleaning material (206). Particulates present in the exhaust are removed by the cleaning material (206). The pressurization of the exhaust and the atmospheric air happens within the space created between the lobes of the first rotatable member (202) and the second rotatable member (204) and the inner walls of the housing of the supercharger (200).

In an embodiment, the cleaning material (206) may be made from rubber. The cleaning material (206) is chosen in such a way so as to have good wear resistant properties and temperature resistance. The cleaning material (206) is provided on the interlobe trough (208) and (210) of the first rotatable member (202) and the second rotatable member (204). The cleaning material (206) may be glued onto the interlobe trough (208) and (210) of the first rotatable member (202) and the second rotatable member (204). The cleaning material (206) may be press fitted and/or snap fitted onto the interlobe trough (208) and (210) of the first rotatable member (202) and the second rotatable member (204). Alternatively, the cleaning material (206) is fitted onto the interlobe trough (208) and (210) of the first rotatable

– 4 –

member (202) and the second rotatable member (204) through a combination comprising, pins, screws, nut and bolt arrangement and the like.

It should be understood that embodiments explained in the description above are only
5 illustrative and do not limit the scope of this invention in terms of type of supercharger used and the mechanism through which the cleaning material is attached onto the interlobe trough of the rotatable member of the supercharger . Many such embodiments and other modifications and changes in the embodiment explained in the description are envisaged. The scope of the invention is only limited by the scope of the claims.

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– 5 –

5 We Claim:

1. A supercharger (200) for an engine (102), located along the inlet to an engine (102),

10 said supercharger (200) having a first rotatable member (202) and a second rotatable member (204), characterized in that

said supercharger (200) adapted to receive recirculated exhaust gas from an engine (102) along with fresh air;

15 and

20 said supercharger (200) provided with a cleaning material (206), said cleaning material (206) is provided in a manner such that at least a part of said first rotatable member (202) and at least a part of said second rotatable member (204) in said supercharger (200) contacts said cleaning material (206).

2. The supercharger (200) of claim 1, wherein said cleaning material (206) is provided on the interlobe trough (208) and (210) of said first rotatable member (202) and said second rotatable member (204).

25 3. The supercharger (200) of claim 1, wherein said cleaning material (206) is glued onto said interlobe trough (208) and (210) of said first rotatable member (202) and said second rotatable member (204).

30 4. The supercharger (200) of claim 1 wherein said cleaning material (206) is press fitted onto said interlobe trough of said first rotatable member (202) and said second rotatable member (204).

– 6 –

5. The supercharger (200) of claim 1, wherein said cleaning material (206) is snap fitted onto said interlobe trough of said first rotatable member (202) and said second rotatable member (204).
- 5 6. The supercharger (200) of claim 1, wherein said cleaning material (206) is fitted onto said interlobe trough of said first rotatable member (202) and said second rotatable member (204) through a combination comprising, pins, screws, nut and bolt arrangement and the like.
- 10 7. The supercharger (200) of claim 1, wherein said first rotatable member (202) contacts said cleaning material (206) provided on said second rotatable member (204).
- 15 8. The supercharger (200) of claim 1, wherein said second rotatable member (204) contacts said cleaning material (206) provided on said first rotatable member (202).
9. The supercharger (200) of claim 1, wherein said cleaning material (206) made from rubber.
- 20 10. The supercharger (200) of claim 1, wherein said supercharger (200) is a roots type supercharger.

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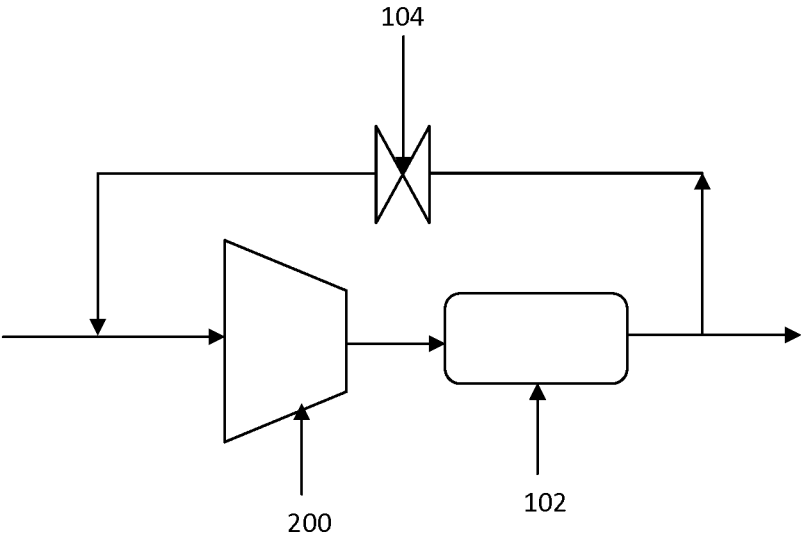


FIG. 1

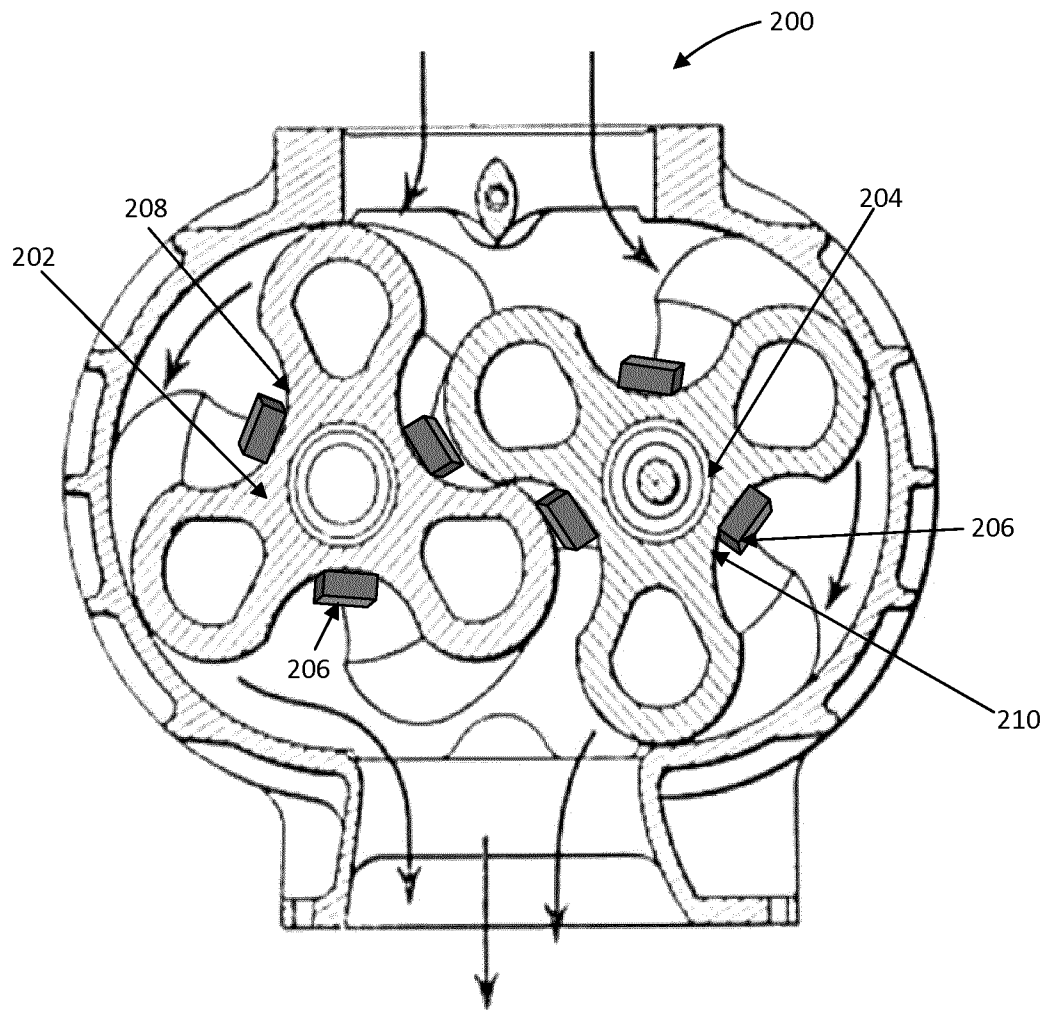


FIG. 2

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/081297

A. CLASSIFICATION OF SUBJECT MATTER INV. F02B33/38 F02M26/50 F04C18/12 F04C18/08 F02M26/03 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) F02B F02M F04C		
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 practicable, 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.
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☐ 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 "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 11 April 2016		Date of mailing of the international search report 21/04/2016
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 Torle, Erik

INTERNATIONAL SEARCH REPORT

Information on patent family members

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