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(71) Applicant
Fuji Jukogyo Kabushiki Kaisha

(Incorporated in Japan)

7-2 Nishi-Shinjuku 1-chome, Shinjuku-ku, Tokyo-To, Japan

(72) Inventors
Akio Yoshimoto
Kenji Shibano

(74) Agent and/or Address for Service
Batchellor Kirk & Eyles
2 Pear Tree Court, Farringdon Road, London, EC1R 0DS, United Kingdom

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US 3568649 A

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UK CL (Edition J) F1B
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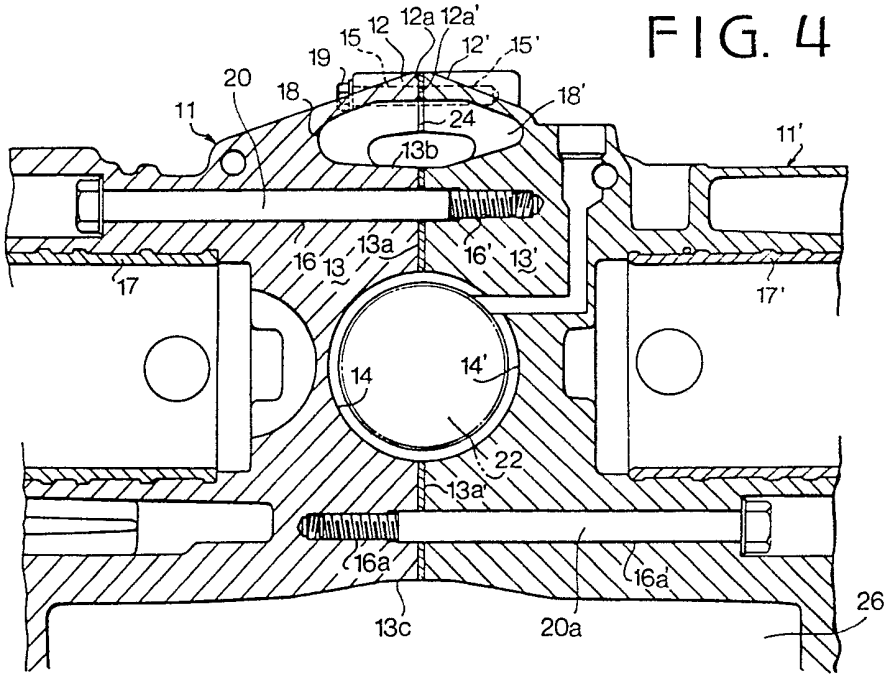
(54) Crankcase for a horizontally opposed-cylinder engine

(57) The crankcase is formed of two opposing parts each having a plurality of vertical bearing housings 13, 13' for supporting a crankshaft. A flange portion 12, 12' is formed on an upper peripheral portion of each crankcase part. A recess 18, 18' is formed between bearing housings 13, 13' and the flange portions 12, 12'. Opposite crankcase parts are joined at faces 13a, 13a' of the bearing housings and at faces 12a, 12a' of the flange portions through a sealing member 24.

FIG. 4



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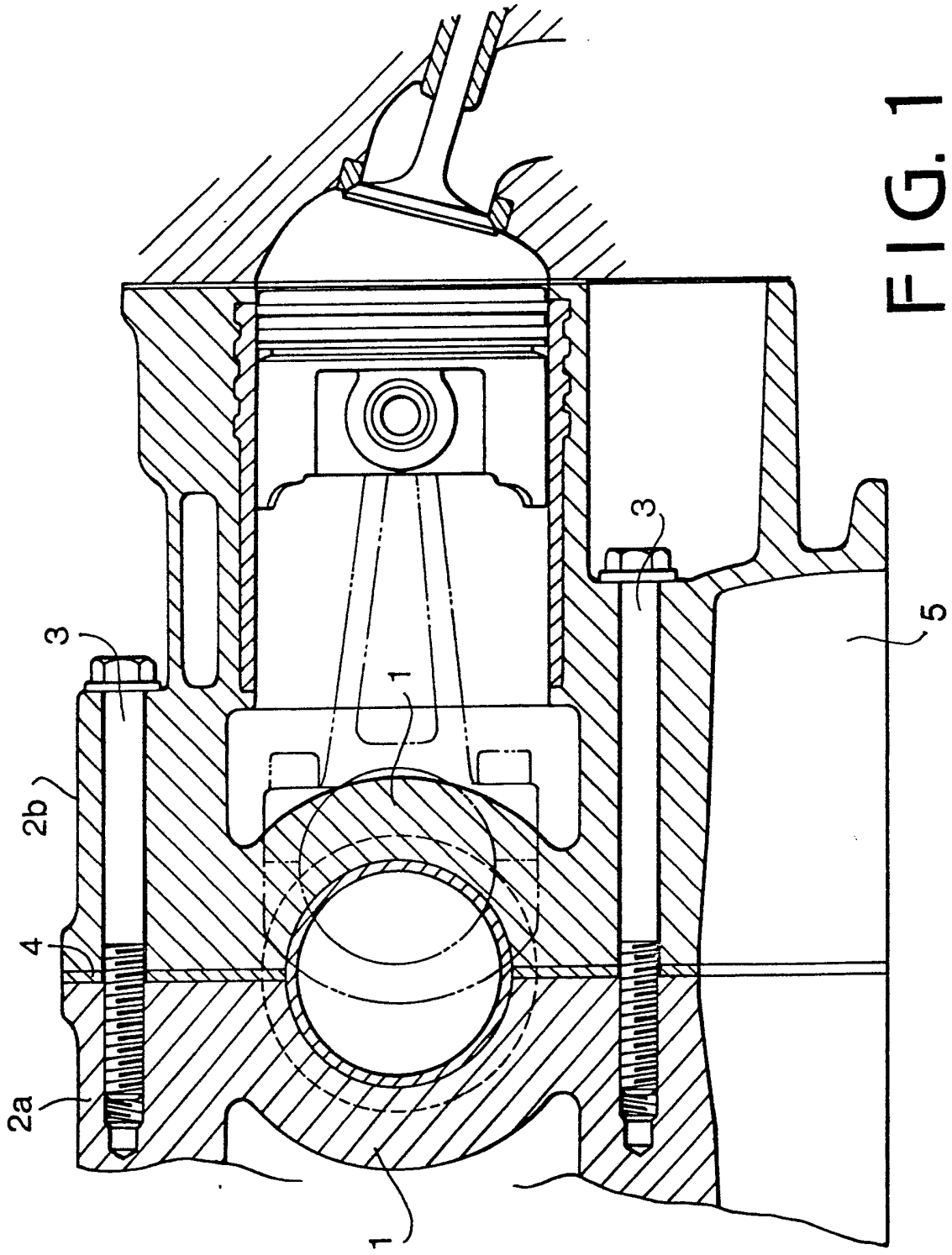


FIG. 1

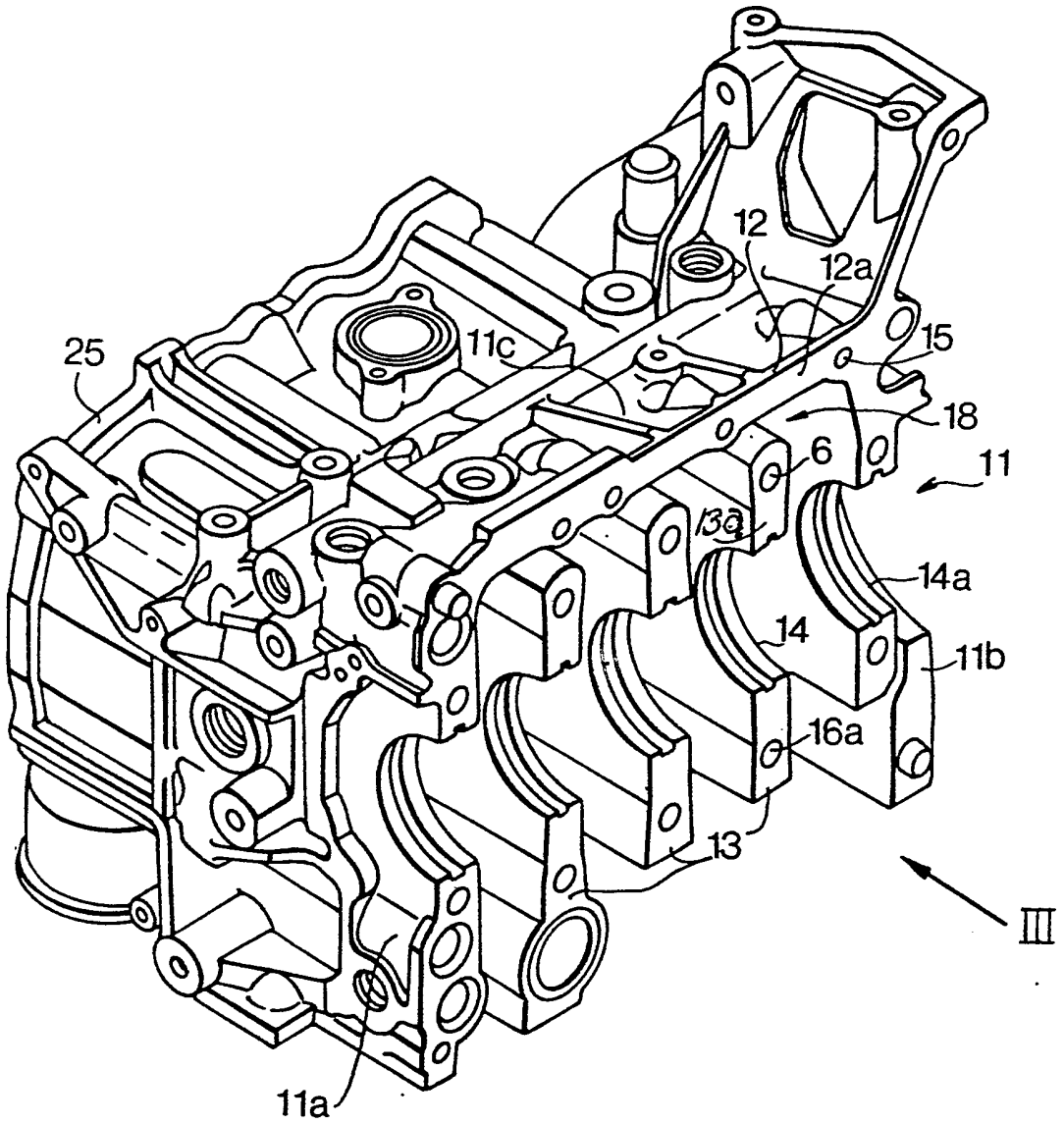


FIG. 2

FIG. 3

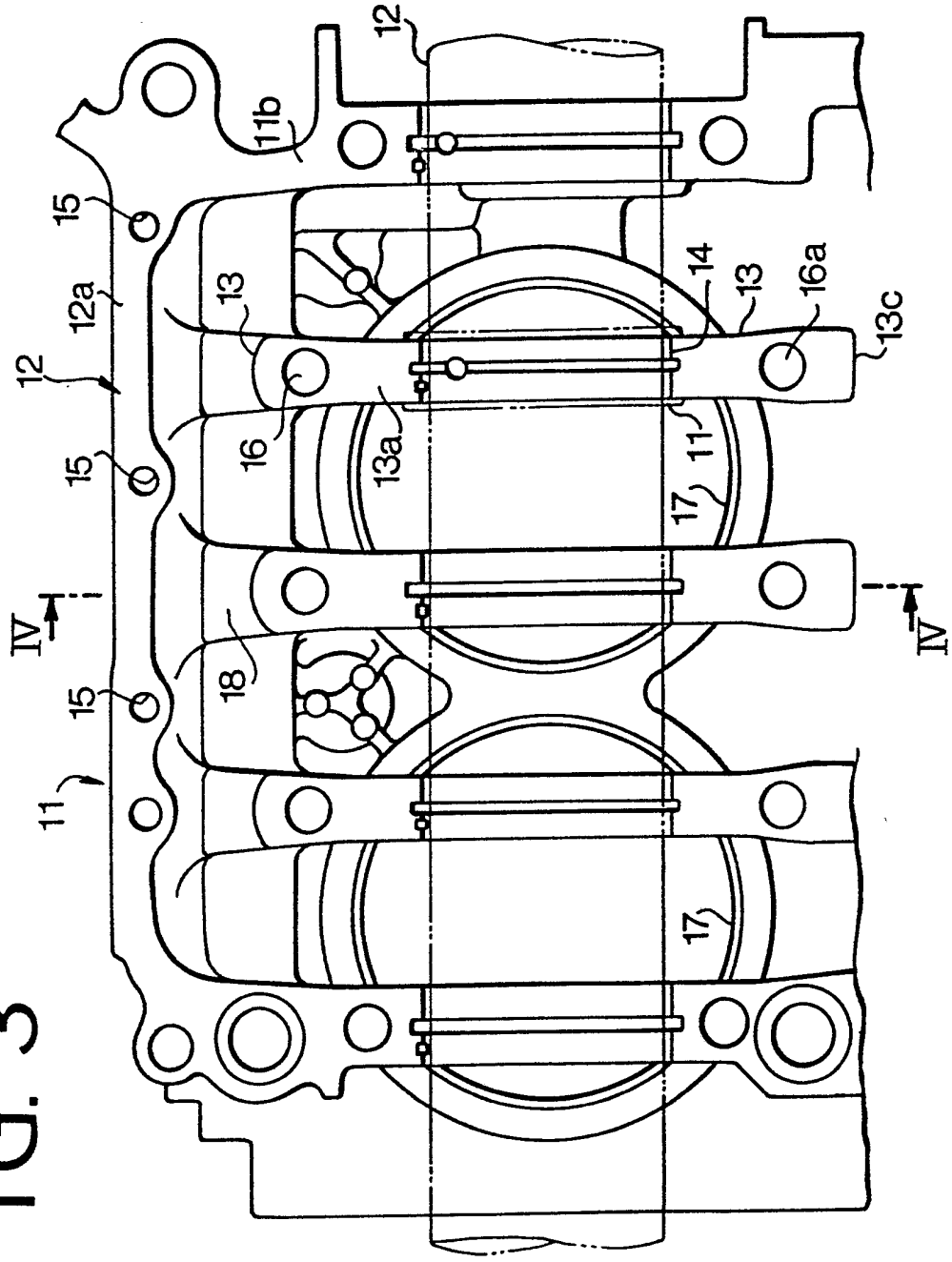
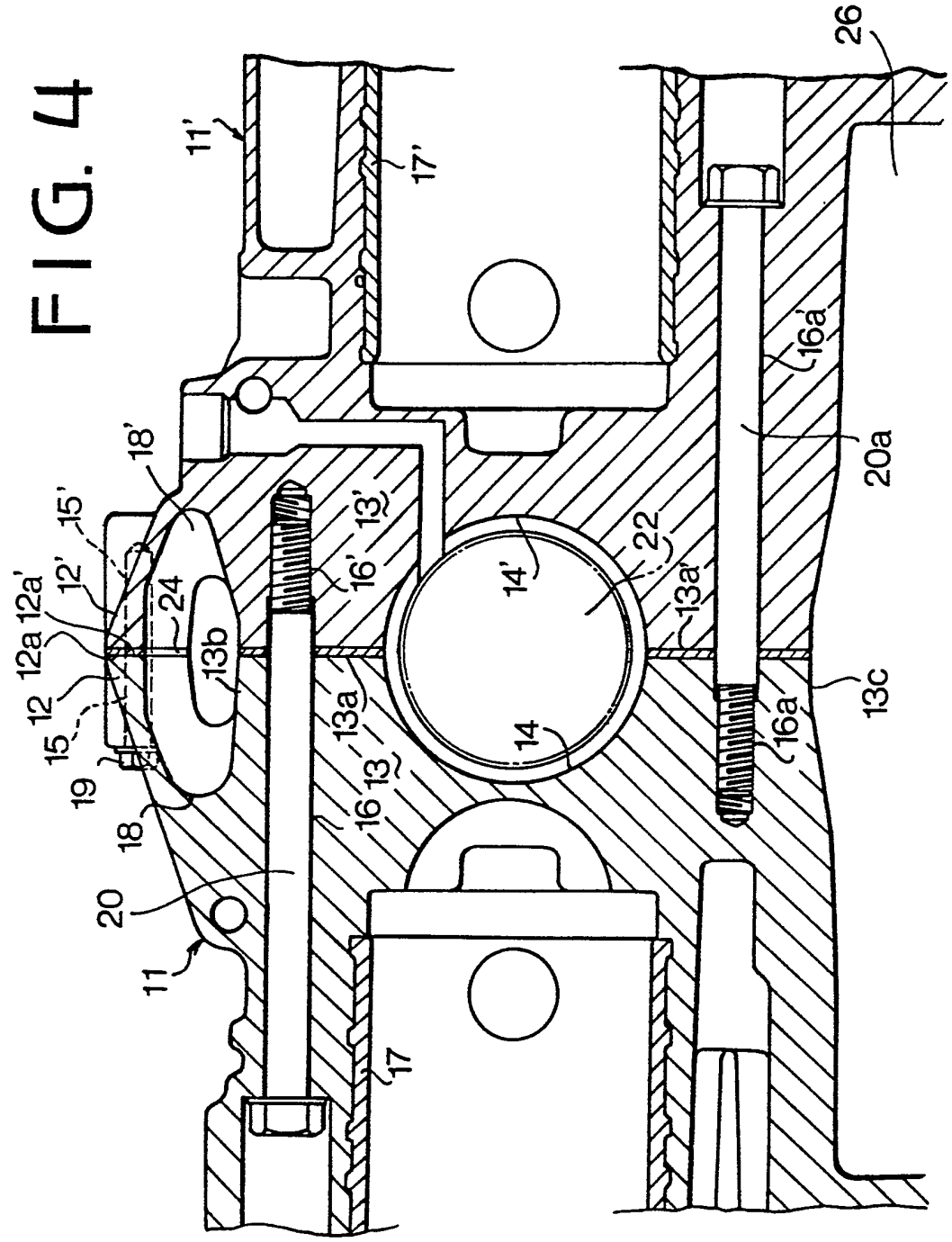


FIG. 4


11'
17'
26
16a'
20a
18'
15'
12'
12a'
12a
12
15
19
18
20
11
24
13b
13'
16'
14'
22
13a'
13a
13
16
14
16a
13c
17

CRANKCASE FOR A HORIZONTALLY OPPOSED-CYLINDER ENGINE

The present invention relates to a crank case for a horizontally opposed-cylinder type engine, and more particularly to structure of a joint part of a crankcase of the engine. The crankcase for the horizontally opposed-cylinder engine comprises two opposed parts.

Fig. 1 shows a part of a crankcase of a conventional opposed-cylinder engine disclosed in Japanese Utility Model Laid-Open 54-38708. In this crankcase a plurality of bearing housing 1 are formed in opposite crankcases 2a and 2b so as to house bearings for a crankshaft. Both the crankcases 2a and 2b are joined at contact faces by bolts 3 through a sealing member 4 for sealing a crank chamber 5.

In such an engine, the vibration of the bearing housings 1 caused by vibration of the crankshaft, fluctuation of torque and so on, adversely affects the sealing member. Consequently, the sealing member fails after a term of use, which causes leakage of oil and/or gas from the crankcase 2a or 2b.

The object of the present invention is to provide a crankcase which alleviates the likelihood of the sealing member failing.

According to the present invention there is provided a crankcase for an opposed-cylinder engine comprising opposed crankcase components, each crankcase

component having a plurality of vertical bearing housings for supporting a crankshaft,

a flange portion formed on an upper peripheral portion of each crankcase component;

each flange portion having a contact face to be engaged with the contact face of the opposite crankcase component;

a recess formed between each bearing housing and the flange portion, each bearing housing having a contact face and

the crankcase components being joined at the contact faces of the bearing housings and at the contact faces of the flange portions and a sealing member being interposed between the contact faces.

An embodiment of a crankcase constructed in accordance with the present invention will now be described by way of example only, with reference to the accompanying drawings; in which,

Fig. 2 is a perspective view of a crankcase of a right hand bank of an opposed-cylinder engine;

Fig. 3 is a side view of the crankcase as viewed from an arrow III of Fig. 2; and

Fig. 4 is a sectional view taken along a line IV-IV of Fig. 3, showing the junction of both the right and a left hand bank.

Referring to Figs. 2 to 4, a right bank crankcase 11 for a horizontally opposed four-cylinder engine according to the present invention has a flange portion 12 formed on an upper wall 11c thereof, three bearing housing 13 vertically formed between a front wall 11a and a rear wall 11b of the crankcase.

Each of the bearing housing 13 has a recess 18 formed on an upper portion thereof. The recess 18 has a U-shape as shown in Fig. 4 to define a space between the bearing housing 13 and the flange portion 12, so that the flange portion 12 is positioned apart from the bearing housing 13. A semicircular hole 14 is formed in each bearing housing 13 for mounting a crankshaft 22 through a bearing. A contact face 12a of the flange portion 12 is in the same plane as a contact face 13a of the each bearing housing 13. An upper periphery 13b of the bearing housing 13 has an arc and a lower end 13c is flat. Each of the front and rear walls 11a and 11b also has a semicircular hole 14a formed coaxially with the semicircular holes 14 of the bearing housings 13.

Three threaded holes 15 are formed in the flange portion 12 and a pair of threaded holes 16 and 16a are formed in each bearing housing 13 at an upper portion and a lower portion. Two cylinder liners 17 are horizontally

mounted in a cylinder block 25 integrally formed adjacent to the crankcase 11 as shown in Fig. 2.

Referring to Fig. 4 since the left bank crankcase 11' is symmetrical with the right bank crankcase 11, the description thereof is omitted and the same part of the crankcase 11' as the crankcase 11 is identified with the same reference numeral as the crankcase 11 with a prime.

The contact faces 12a and 13a of the right bank crankcase 11 are engaged with the contact faces 12a' and 13a' of the left bank crankcase 11'. The contact face 12a is joined with the contact face 12a' through a sealing member 24 by bolts 19 engaged with holes 15 and 15'. The contact faces 13a are joined with the contact faces 13a' through a sealing member 24a by bolts 20 and 20a engaged with holes 16 and 16', and 16a and 16a', respectively. The flange portions 12 and 12' are sealed by the sealing member 24, thereby preventing the leakage of oil from a crank chamber 26. The cylinders formed in the cylinder liners 17 and 17' are communicated with each other through recesses 18 and 18', respectively.

In accordance with the present invention, the recesses 18 and 18' are formed between the bearing housing 13, 13' and the flange portions 12, 12'. Thus, during operation of the engine, the vibration of the housings 13, 13' is not

directly transmitted to the flange portions 12, 12', and hence to the sealing members 24. Consequently, the sealing effect between flange portions 12 and 12' is ensured for a long time.

Further, since the adjacent cylinders are communicated with each other through the recesses 18 and 18', peak pressure in the crankcase caused by movement of the piston is reduced. Thus, friction against the pistons is reduced and the surface of oil in an oil pan is stabilized.

CLAIMS

1. A crankcase for an opposed-cylinder engine comprising opposed crankcase components, each crankcase component having a plurality of vertical bearing housings for supporting a crankshaft,

a flange portion formed on an upper peripheral portion of each crankcase component;

each flange portion having a contact face to be engaged with the contact face of the opposite crankcase component;

a recess formed between each bearing housing and the flange portion, each bearing housing having a contact face and

the crankcase components being joined at the contact faces of the bearing housings and at the contact faces of the flange portions and a sealing member being interposed between the contact faces.

2. A crankcase according to claim 1, wherein

the recess has a U-shape as viewed in the axial direction of the crankshaft.

3. A crankcase according to claim 1 or claim 2, comprising:

a plurality of cylinders communicating with each other through said recesses.

4. A crankcase as herein described with reference to figures 2 to 4 of the accompanying drawings.

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