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(54) **Oil scrubber for engine**

(57) In an example, an engine 1 comprises a crankcase 4 having a lower opening 3, a crankshaft 6 supported on the crankcase 4 and capable of making a rotation R around a shaft center 5 extending approximately horizontally, and a baffle plate 18 for covering the lower opening 3. A communication passage 25 for communicating a crank chamber 2 and a space below is formed between an opening edge 21 of the lower opening 3 and an outer periphery 22 of the baffle plate 18. A linear protrusion 26 is disposed extending approximately in parallel with the crankshaft 6 and protruding upward from the baffle plate 18. Assuming that a region along the lower opening 3 is in the front (Fr) part in the direction of the rotation R of the crankshaft 6, the linear protrusion 26 is fitted into the rear part of the lower opening 3.

Such an arrangement can prevent oil in an engine comprising a baffle plate covering a lower opening of a crankcase from rotating unnecessarily in a crank chamber along with a crankshaft, and to prevent unnecessary power loss in the engine.

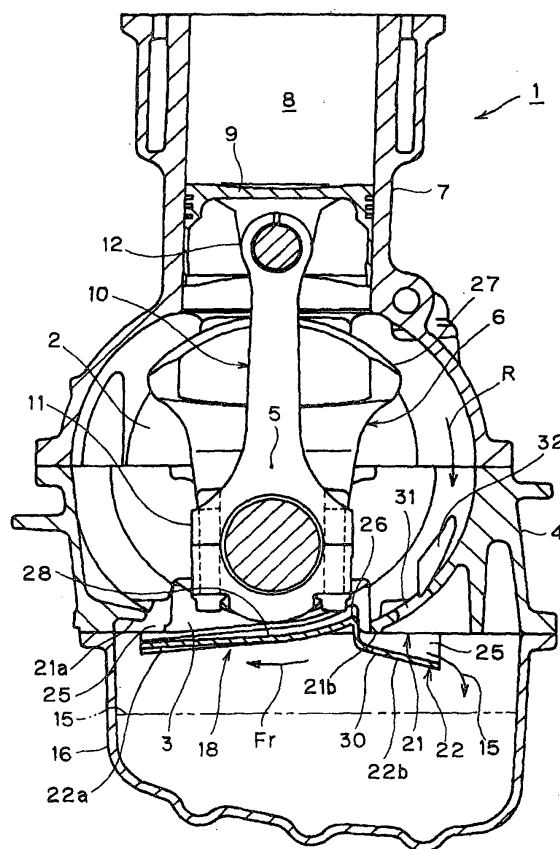


FIG. 1

Description

[0001] This invention relates to an oil scrubber in an engine. In preferred examples, the apparatus comprises a baffle plate covering a lower opening of a crankcase.

[0002] A conventional oil scrubber in an engine is disclosed in Patent publication JP-A-H08-296500. The engine disclosed in the above publication comprises a crankcase having a lower opening for opening a crank chamber downward, a crankshaft disposed in the crank chamber, and supported on the crankcase for rotation around a shaft center extending approximately horizontally, a baffle plate for covering the lower opening, and an oil pan, for reserving oil, fixed to the lower end of the crankcase.

[0003] When the engine is driven and the crankshaft is rotated, oil is generally circulated along with the rotation of the crankshaft in the crank chamber. If the oil circulated in this manner is directly spread toward the inside of the oil pan through the lower opening, bubbles may be undesirably formed in the oil inside the oil pan. In this view, the baffle plate is provided as described above, preventing the oil from being directly spread toward the oil pan, thereby preventing the bubbles from being formed. Reversely, when the oil in the oil pan is returned toward the crank chamber through the lower opening, the undesirable reverse flow is interrupted by the baffle plate.

[0004] The oil in the oil pan is supplied to lubricated portions of the engine by an oil pump. After these portions are lubricated, the oil is returned to the crank chamber. The oil returned to the crank chamber is drained downward from the crank chamber through through-holes formed in the baffle plate, returned to the inside of the oil pan, and then resupplied to the lubricated portions, as described above.

[0005] In the conventional engine as described above, part of the oil in the crank chamber is drained downward through the through holes of the baffle plate. The increased area of the through holes is conceivable as a means of draining the oil more smoothly. However, the area of the through holes cannot be fully increased in order to maintain the strength of the baffle plate. Therefore, when the oil is drained from the crank chamber through the through holes, the oil may be prevented from being drained smoothly. As a result, the undrained oil in the crank chamber is unnecessarily circulated along with the rotation of the crankshaft, thereby causing unnecessary power loss in the engine.

[0006] This invention is made in view of the foregoing problems and the object of examples is to prevent oil in an engine comprising a baffle plate covering a lower opening of a crankcase from being unnecessarily circulated in a crank chamber along with the rotation of a crankshaft, to prevent unnecessary power loss in the engine, and to increase the strength of the baffle plate.

[0007] In order to seek to solve the foregoing problems, an oil scrubber in an engine according to an as-

pect of the present invention is described as follows. Incidentally, reference numerals denoting the terms herein are not to be interpreted as a limitation of the technical scope of the present invention to the descriptions of embodiment of the invention to be discussed later, or limiting in any other way.

[0008] According to an aspect of the invention there is provided an oil scrubber in an engine comprising a crankcase 4 having a lower opening 3 for opening a crank chamber 2 downward, a crankshaft 6 disposed in the crank chamber 2, and supported on the crankcase 4 for a rotation R around a shaft center 5 extending approximately horizontally, and a baffle plate 18 for covering the lower opening 3,

wherein a communication passage 25 is formed between an opening edge 21 of the lower opening 3 and an outer periphery 22 of the baffle plate 18 to communicate the crank chamber 2 and a space therebelow, a linear protrusion 26 is disposed extending approximately in parallel with the crankshaft 6 and protruding upward from the baffle plate 18, and assuming that a region along the lower opening 3 is in the front (Fr) part in the direction of a rotation of the crankshaft 6, the linear protrusion 26 is fitted into the rear part of the lower opening 3.

[0009] Preferably the linear protrusion 26 is formed by bending a part of the baffle plate 18.

[0010] Preferably a rotation track of a large end 11 of a connecting rod 10 interlocked with the crankshaft 6 is fitted into a groove 28 formed on an upper surface of the baffle plate 18 by bending the baffle plate 18.

[0011] Preferably a rear opening edge 21b of the lower opening 3 is faced by a rear outer periphery 22b of the baffle plate 18 from below, and a through hole 30 is formed on the rear outer periphery 22b of the baffle plate 18 to penetrate vertically.

[0012] Preferably an additional through hole 31 is formed in the rear opening edge 21b of the lower opening 3 to penetrate vertically.

[0013] Preferably a guide 32 is provided to guide oil 15, flowing forward along an inner surface of the crank chamber 2 in the rear of the additional through hole 31, to the additional through hole 31.

[0014] A broad aspect of the invention provides an engine comprising a crankshaft and means for scraping lubricant from a crankshaft web during rotation thereof.

[0015] A further broad aspect provides an engine, comprising a crankshaft and a baffle arranged adjacent the crankshaft.

[0016] Preferably the scraping means comprises a crankcase baffle. Preferably the baffle is configured to reduce the amount of bubbles formed in the lubricant and/or to increase draining of lubricant from the crank chamber of the engine.

[0017] Also provided by the invention is a baffle for an engine as described herein.

[0018] The invention extends to methods and/or apparatus substantially as herein described with reference

to the accompanying drawings.

[0019] Any feature in one aspect of the invention may be applied to other aspects of the invention, in any appropriate combination. In particular, method aspects may be applied to apparatus aspects, and vice versa.

[0020] Preferred features of the present invention will now be described, purely by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a partial sectional side view of an engine according to a first embodiment.

Fig. 2 is a partial front view of the engine according to the first embodiment.

Fig. 3 is a sectional side view of another part of the engine according to the first embodiment.

Fig. 4 is a partial plan view of the engine according to the first embodiment.

Fig. 5 is a perspective view of the part of the engine shown in Fig. 2 according to the first embodiment.

Fig. 6 is a perspective view of a baffle plate according to the first embodiment.

Fig. 7 is a drawing corresponding to Fig. 1 according to a second embodiment.

Fig. 8 is a drawing corresponding to Fig. 6 according to the second embodiment.

[0021] Figs. 1 to 6 show a first embodiment of the invention.

[0022] In the drawings, reference numeral 1 designates a multi-cylinder (four-cylinder) four-cycle engine (internal combustion engine) mounted on a vehicle such as an automobile.

[0023] The engine 1 comprises a crankcase 4 supported on the vehicle body, the inside of which is used as a crank chamber 2, and having a lower opening 3 for opening the crank chamber 2 downward, a crankshaft 6 disposed in the crank chamber 2, supported on the crankcase 4, and capable of making a rotation R around a shaft center 5 extending approximately horizontally, cylinders 7 supported on the upper end of the crankcase 4, pistons 9 fitted into a cylinder hole 8 of the respective cylinders 7 to be axially slidable, and connecting rods 10 for interlocking the crankshaft 6 and the respective pistons 9. The connecting rod 10 comprises a large end 11 constituting a lower end thereof and supported by a crank pin of the crankshaft 6 and a small end 12 constituting an upper end thereof and supported by a piston pin of the piston 9.

[0024] The engine 1 comprises an oil pan 16, for reserving oil 15, fixed to the lower end of the crankcase 4 to entirely cover the lower opening 3 from below, and a baffle plate 18 made of a metal plate, for entirely covering the lower opening 3 from below, and fixed to the lower end of the crankcase 4 with a fastener 17. An opening edge 21 of the lower opening 3 is faced with an outer periphery 22 of the baffle plate 18 from below.

[0025] Descriptions will be made below assuming that a region along the lower opening 3 is in the front (Fr)

part in the direction of the rotation R of the crankshaft 6, which is driven by the engine 1.

[0026] A communication passage 25 for communicating the crank chamber 2 with the inside of the oil pan 16 therebelow is formed between the opening edge 21 of the lower opening 3 and the outer periphery 22 of the baffle plate 18, at least at positions between front and rear opening edges 21a and 21b of the lower opening 3, and front and rear outer peripheries 22a and 22b of the baffle plate 18, respectively.

[0027] A linear protrusion 26 is formed by bending the baffle plate 18 at a longitudinal middle portion thereof so as to protrude upward and extend approximately in parallel with the crankshaft 6. The linear protrusion 26 is continuously formed almost through the baffle plate 18 in its width direction. The linear protrusion 26 is disposed adjacent to the rear opening edge 21b of the lower opening 3 with a slight clearance and fitted from below into the rear part of the lower opening 3, more specifically into the rear end thereof. The linear protrusion 26 is placed in the rear of the lowest end of the rotation track of the large end 11 of each connecting rod 10 interlocked with the crankshaft 6. The protruding end of the linear protrusion 26 protrudes above the inner front end of the rear opening edge 21b of the lower opening 3 adjacently disposed in the rear of the linear protrusion 26.

[0028] The front part of the baffle plate 18 is positioned in the front of the linear protrusion 26 and approximately entirely sloped down toward the front. A portion of the rear outer periphery 22b of the baffle plate 18, which is fixed to the lower end of the crankcase 4 with the fastener 17, extends horizontally rearward. Portions in the rear of a crank web 27 of each piston 9 and in the rear of the large end 11 of each connecting rod 10 are sloped down toward the rear. The rear outer periphery 22b of the baffle plate 18 is bent alternately upward and downward to increase its rigidity.

[0029] Grooves 28, into which the rotation track of the large end 11 of each connecting rod 10 interlocked with the crankshaft 6 is fitted, are formed on the upper surface of the baffle plate 18 by bending the baffle plate 18. Each of these grooves 28 extends to be sloped down toward the front approximately in parallel with one another.

[0030] As shown in Figs. 1, 2, 5, and 6, a plurality of through holes 30 to penetrate vertically are formed on the rear outer periphery 22b of the baffle plate 18 at portions sloped down toward the rear. These through holes 30 are disposed in the same positions as the respective large ends 11 in the axial direction of the crankshaft 6, and covered with the rear opening edge 21b of the lower opening 3 from above.

[0031] As shown in Figs. 1 and 4, a plurality of additional through holes 31 to penetrate vertically are formed in the rear opening edge 21b of the lower opening 3. These additional through holes 31 are disposed in the same positions as the respective large ends 11 in the

axial direction of the crankshaft 6, and covered with the rear outer periphery 22b of the baffle plate 18 from below. A pair of guides 32, 32 are integrally formed to protrude from the inner surface of the crank chamber 2 in the rear of each of the additional through holes 31. The pair of these guides 32, 32 guide the oil 15, flowing forward along the inner surface of the crank chamber 2, to the additional through hole 31. A hole-rear-edge of the additional through hole 31 is formed thinner from the rear toward the additional through hole 31, and an imaginary extending plane extends forward along the upper surface of the hole-rear-edge of the additional through hole 31, and toward the inside of the additional through hole 31.

[0032] The engine 1 adopts a wet sump lubrication system. When the engine 1 is driven, the oil 15 is circulated along with the rotation R of the crankshaft 6 in the crank chamber 2, and is directly spread toward the inside of the oil pan 16 through the lower opening 3. In the course of this, the oil 15 spread toward the inside of the oil pan 16 is interrupted by the baffle plate 18, and bubbles are not formed in the oil 15 in the oil pan 16. Conversely, when the oil 15 in the oil pan 16 is returned toward the crank chamber 2 through the lower opening 3, the undesirable reverse flow is interrupted by the baffle plate 18.

[0033] The oil 15 in the oil pan 16 is supplied to lubricated portions of the engine 1. After these portions are lubricated, the oil 15 is returned to the crank chamber 2. The oil 15 returned to the crank chamber 2 is drained downward from the crank chamber 2 through the communication passages 25, returned to the inside of the oil pan 16, and then resupplied to the lubricated portions, as described above.

[0034] In the above constitution, the communication passages 25 for communicating the crank chamber 2 and the space therebelow are formed between the opening edge 21 of the lower opening 3 and the outer periphery 22 of the baffle plate 18. The linear protrusion 26 is disposed extending approximately in parallel with the crankshaft 6 and protruding upward from the baffle plate 18. Assuming that a region along the lower opening 3 is in the front (Fr) part in the direction of the rotation R of the crankshaft 6, the linear protrusion 26 is fitted into the rear part of the lower opening 3.

[0035] After lubricating the lubricated portions of the engine 1, the oil 15 in the crank chamber 2 flows along the inner surface of the crank chamber 2 along with the rotation R of the crankshaft 6. When the oil 15 reaches the lower opening 3, the oil 15 first meets the linear protrusion 26, which interrupts the oil flow. The oil 15 is then drained downward from the crank chamber 2 through the communication passage 25 between the rear opening edge 21b of the lower opening 3 and the rear outer periphery 22b of the baffle plate 18, and returned to the inside of the oil pan 16. Some of the oil 15, which has passed forward over the linear protrusion 26, is then drained downward from the crank chamber 2 through

the communication passage 25 between the front opening edge 21a of the lower opening 3 and the front outer periphery 22a of the baffle plate 18, and returned to the inside of the oil pan 16.

[0036] The communication passages 25 are formed between the opening edge 21 of the lower opening 3 and the outer periphery 22 of the baffle plate 18, and can be made larger without affecting the strength of the baffle plate 18. Making the communication passages 25 larger allows the oil 15 to drain smoothly from the crank chamber 2 through the communication passages 25.

[0037] Thus, the oil 15 is prevented from being circulated unnecessarily in the crank chamber 2 along with the rotation R of the crankshaft 6, thereby bringing the "effect" of preventing unnecessary power loss in the engine 1.

[0038] The protruding end of the linear protrusion 26 protrudes above the inner forward end of the rear opening edge 21b of the lower opening 3 adjacently disposed in the rear of the linear protrusion 26.

[0039] When the oil 15 in the crank chamber 2 flows along the inner surface of the crank chamber 2 along with the rotation R of the crankshaft 6, and reaches the lower opening 3, the oil 15 meets the linear protrusion 26 more reliably and the oil flow along with the rotation R of the crankshaft 6 is more reliably interrupted. Thus, it is possible to drain the oil 15 downward from the crank chamber 2 more smoothly through the communication passage 25, thereby enhancing the "effect."

[0040] As described above, the linear protrusion 26 is formed by bending a part of the baffle plate 18.

[0041] This allows the linear protrusion 26 to serve as a bead in the baffle plate 18 and to give the baffle plate 18 increased strength with simple configuration.

[0042] As described above, the grooves 28, into which the rotation track of the large end 11 of each connecting rod 10 interlocked with the crankshaft 6 is fitted, are formed on the upper surface of the baffle plate 18 by bending the baffle plate 18.

[0043] The rotation track of the large end 11 of each connecting rod 10 is fitted into the groove 28 on the baffle plate 18, and accordingly larger part of the upper surface of the baffle plate 18 can be placed closer to the outer circumference of the rotation track of the crankshaft 6.

[0044] Thus, the oil 15, flowing along with the rotation R of the crankshaft 6 adjacently outside the outer circumference of the rotation track of the crankshaft 6, meets the linear protrusion 26 more effectively, which interrupts the oil flow. This allows the oil 15 to drain downward from the crank chamber 2 more smoothly through the communication passage 25, thereby further enhancing the "effect."

[0045] Since the grooves 28 are formed by bending the baffle plate 18, the grooves 28 can serve as a bead in the baffle plate 18. The grooves 28 extend in a direction approximately perpendicular to the linear protrusion 26.

[0046] The grooves 28 in cooperation with the linear protrusion 26 more effectively gives the baffle plate 18 increased strength with simple configuration.

[0047] As described above, the rear opening edge 21b of the lower opening 3 is faced by the rear outer periphery 22b of the baffle plate 18 from below, in which the through holes 30 are formed to penetrate vertically.

[0048] When the oil 15 is drained downward from the crank chamber 2 through the communication passage 25, part of the oil 15 can be drained through the through holes 30. This allows the oil 15 to be drained downward from the crank chamber 2 more quickly. Accordingly, the oil 15 can be drained downward from the crank chamber 2 more smoothly, thereby further enhancing the "effect."

[0049] Since the through holes 30 are covered with the rear opening edge 21b of the lower opening 3 from above, the oil 15 flowing along with the rotation R of the crankshaft 6 in the crank chamber 2 is prevented from being directly spread toward the inside of the oil pan 16 below the crank chamber 2 through the through holes 30. Reversely, the oil 15 is prevented from returning through the through holes 30 to the crank chamber 2 from the oil pan 16 therebelow.

[0050] As described above, the additional through holes 31 to penetrate vertically are formed in the rear opening edge 21b of the lower opening 3.

[0051] When the oil 15 flows to the front (Fr) along with the rotation R of the crankshaft 6 in the crank chamber 2 along the inner surface thereof, part of the oil 15 is drained downward from the crank chamber 2 more quickly through the additional through holes 31 before reaching the lower opening 3. Accordingly, the oil 15 can be drained downward from the crank chamber 2 more smoothly, thereby further enhancing the "effect."

[0052] Since the additional through holes 31 are covered with the rear outer periphery 22b of the baffle plate 18 from below, the oil 15 flowing along with the rotation R of the crankshaft 6 in the crank chamber 2 is prevented from being directly spread toward the inside of the oil pan 16 below the crank chamber 2 through the additional through holes 31. Reversely, the oil 15 is prevented from returning through the additional through holes 31 to the crank chamber 2 from the oil pan 16 therebelow.

[0053] As described above, the guides 32 are provided to guide the oil 15, flowing forward along the inner surface of the crank chamber 2 in the rear of the additional through holes 31, to the additional through holes 31.

[0054] When the oil 15 flows to the front (Fr) along with the rotation R of the crankshaft 6 in the crank chamber 2 along the inner surface thereof, larger amount of said oil 15 is guided by the guides 32 to be drained downward from the crank chamber 2 more quickly through the additional through holes 31.

[0055] The subsequent drawings show a second embodiment of the invention. The constitution of this embodiment, and the functions and effects thereof are sim-

ilar in many respects to those of the foregoing first embodiment. Hereinafter, redundant descriptions will be omitted by giving an identical symbol to the similar components, and descriptions of the differences will be chiefly made. Components of each embodiment may be combined together in view of the object of the invention, and the functions and effects thereof.

[0056] Figs. 7 and 8 show the second embodiment of the invention.

[0057] In this embodiment, the additional through holes 31 are formed with the hole center directed toward the outside of the tangent of the inner surface of the crank chamber 2.

[0058] In the above arrangement, when the oil 15 flows to the front (Fr) along with the rotation R of the crankshaft 6 in the crank chamber 2 along the inner surface thereof, part of the oil 15 is drained more quickly downward from the crank chamber 2 more reliably through the additional through holes 31 and then through the communication passages 25, thereby further enhancing the "effect."

[0059] The rear outer periphery 22b of the baffle plate 18 is not formed with the through holes 30.

[0060] Without reference to the above embodiments shown in the drawings, the engine 1 may be a single-cylinder type. The engine 1 may adopt a dry sump lubrication system, in which an oil tank, and an oil pump which delivers the oil 15 drained downward from the crank chamber 2 to the oil tank, are substituted for the oil pan 16.

[0061] The baffle plate 18 and the linear protrusion 26 may be separate components. The linear protrusion 26 may be formed discontinuously. The guides 32 may be omitted.

[0062] Effects of preferred features of the invention are as follows.

[0063] A further aspect of the present invention provides an oil scrubber in an engine comprising a crankcase having a lower opening for opening a crank chamber downward, a crankshaft disposed in the crank chamber, and supported on the crankcase for a rotation around a shaft center extending approximately horizontally, and a baffle plate for covering the lower opening, wherein a communication passage is formed between an opening edge of the lower opening and an outer periphery of the baffle plate to communicate the crank chamber and a space therebelow, a linear protrusion is disposed extending approximately in parallel with the crankshaft and protruding upward from the baffle plate, and assuming that a region along the lower opening is in the front part in the direction of a rotation of the crankshaft, the linear protrusion is fitted into the rear part of the lower opening.

[0064] When the oil in the crank chamber flows along the inner surface of the crank chamber along with the rotation of the crankshaft, and reaches the lower opening, the oil first meets the linear protrusion, which interrupts the oil flow along with the rotation of the crankshaft.

The oil then is drained downward from the crank chamber through the communication passage between the rear opening edge of the lower opening and the rear outer periphery of the baffle plate.

[0065] The communication passages are formed between the opening edge of the lower opening and the outer periphery of the baffle plate, and can be made larger without affecting the strength of the baffle plate. Making the communication passages larger allows the oil to drain smoothly from the crank chamber through the communication passages.

[0066] Thus, the oil is prevented from being circulated unnecessarily in the crank chamber along with the rotation of the crankshaft, thereby bringing the "effect" of preventing unnecessary power loss in the engine.

[0067] Preferably in the oil scrubber in an engine, the linear protrusion is formed by bending a part of the baffle plate.

[0068] This allows the linear protrusion to serve as a bead in the baffle plate and to give the baffle plate increased strength with simple configuration.

[0069] Preferably in the oil scrubber in an engine, a rotation track of a large end of a connecting rod interlocked with the crankshaft is fitted into a groove formed on an upper surface of the baffle plate by bending the baffle plate.

[0070] The rotation track of the large end of each connecting rod is fitted into the groove on the baffle plate, and accordingly larger part of the upper surface of the baffle plate can be placed closer to the outer circumference of the rotation track of the crankshaft.

[0071] Thus, the oil, flowing along with the rotation of the crankshaft adjacently outside the outer circumference of the rotation track of the crankshaft, meets the linear protrusion more effectively, which interrupts the oil flow. Thus, it is possible to drain the oil downward from the crank chamber more smoothly through the communication passage, thereby further enhancing the "effect" of this further aspect.

[0072] Since the grooves are formed by bending the baffle plate, the grooves can serve as a bead in the baffle plate. The grooves extend in a direction approximately perpendicular to the linear protrusion.

[0073] The grooves in cooperation with the linear protrusion more effectively gives the baffle plate increased strength with simple configuration.

[0074] Preferably in the oil scrubber in an engine, a rear opening edge of the lower opening is faced by a rear outer periphery of the baffle plate from below, and a through hole is formed on the rear outer periphery of the baffle plate to penetrate vertically.

[0075] When the oil is drained downward from the crank chamber through the communication passage, part of the oil can be drained through the through holes. This allows the oil to be drained downward from the crank chamber more quickly. Accordingly, the oil can be discharged downward from the crank chamber more smoothly, thereby further enhancing the "effect" of this

further aspect.

[0076] Preferably in the oil scrubber in an engine, an additional through hole is formed in the rear opening edge of the lower opening to penetrate vertically.

[0077] When the oil flows to the front along with the rotation of the crankshaft in the crank chamber along the inner surface thereof, part of the oil is drained downward from the crank chamber more quickly through the additional through holes before reaching the lower opening. Accordingly, the oil can be discharged downward from the crank chamber more smoothly, thereby further enhancing the "effect" of this further aspect.

[0078] Preferably in the oil scrubber in an engine, a guide is provided to guide oil, flowing forward along an inner surface of the crank chamber in the rear of the additional through hole, to the additional through hole.

[0079] When the oil flows to the front along with the rotation of the crankshaft in the crank chamber along the inner surface thereof, larger amount of said oil is guided by the guides to be drained downward from the crank chamber more quickly through the additional through holes, thereby enhancing the effect of the provision of the through hole.

[0080] In a preferred example, an engine 1 comprises a crankcase 4 having a lower opening 3, a crankshaft 6 supported on the crankcase 4 and capable of making a rotation R around a shaft center 5 extending approximately horizontally, and a baffle plate 18 for covering the lower opening 3. A communication passage 25 for communicating a crank chamber 2 and a space below is formed between an opening edge 21 of the lower opening 3 and an outer periphery 22 of the baffle plate 18. A linear protrusion 26 is disposed extending approximately in parallel with the crankshaft 6 and protruding upward from the baffle plate 18. Assuming that a region along the lower opening 3 is in the front (Fr) part in the direction of the rotation R of the crankshaft 6, the linear protrusion 26 is fitted into the rear part of the lower opening 3.

[0081] Such an arrangement can prevent oil in an engine comprising a baffle plate covering a lower opening of a crankcase from rotating unnecessarily in a crank chamber along with a crankshaft, and to prevent unnecessary power loss in the engine.

[0082] It will be understood that the present invention has been described above purely by way of example, and modification of detail can be made within the scope of the invention.

[0083] Each feature disclosed in the description, and (where appropriate) the claims and drawings may be provided independently or in any appropriate combination.

Explanation of Reference Numerals

[0084]

1: engine

2: crank chamber
 3: lower opening
 4: crankcase
 5: shaft center
 6: crankshaft
 7: cylinder
 8: cylinder hole
 9: piston
 10: connecting rod
 11: large end
 15: oil
 16: oil pan
 18: baffle plate
 21: opening edge
 21a: front opening edge
 21b: rear opening edge
 22: outer periphery
 22a: front outer periphery
 22b: rear outer periphery
 25: communication passage
 26: linear protrusion
 27: crank web
 28: groove
 30: through hole
 31: additional through hole
 32: guide
 R: rotation

Claims

1. An oil scrubber for an engine comprising a crankcase having a lower opening for opening a crank chamber downward, a crankshaft disposed in the crank chamber, supported on the crankcase, and rotatable around a shaft center extending approximately horizontally, and a baffle plate for covering the lower opening,
 wherein a communication passage is formed between an opening edge of the lower opening and an outer periphery of the baffle plate to communicate the crank chamber and a space therebelow, a linear protrusion is disposed extending approximately in parallel with the crankshaft and protruding upward from the baffle plate, and assuming that a region along the lower opening is in the front part in the direction of a rotation of the crankshaft, the linear protrusion is fitted into the rear part of the lower opening.
2. The oil scrubber in an engine according to Claim 1, wherein the linear protrusion is formed by bending a part of the baffle plate.
3. The oil scrubber in an engine according to Claim 1, wherein a rotation track of a large end of a connecting rod interlocked with the crankshaft is fitted into a groove formed on an upper surface of the baffle plate by bending the baffle plate.
4. The oil scrubber in an engine according to any one of Claims 1 to 3, wherein a rear opening edge of the lower opening is faced by a rear outer periphery of the baffle plate from below, and a through hole is formed on the rear outer periphery of the baffle plate to penetrate vertically.
5. The oil scrubber in an engine according to Claim 4, wherein an additional through hole is formed in the rear opening edge of the lower opening to penetrate vertically.
6. The oil scrubber in an engine according to Claim 5, wherein a guide is provided to guide oil, flowing forward along an inner surface of the crank chamber in the rear of the additional through hole, to the additional through hole.
7. An engine comprising a crankshaft and means for scraping lubricant from a crankshaft web during rotation thereof.
8. An engine according to claim 7 wherein the scraping means comprises a crankcase baffle.
9. An engine comprising a crankshaft and a baffle arranged adjacent the crankshaft.
10. An engine according to claim 8 or claim 9 wherein the baffle is configured to reduce the amount of bubbles formed in the lubricant.
11. An engine according to any of claims 8 to 10 wherein the baffle is configured to increase draining of lubricant from the crank chamber of the engine.
12. A baffle for an apparatus according to any of claims 1 to 11.

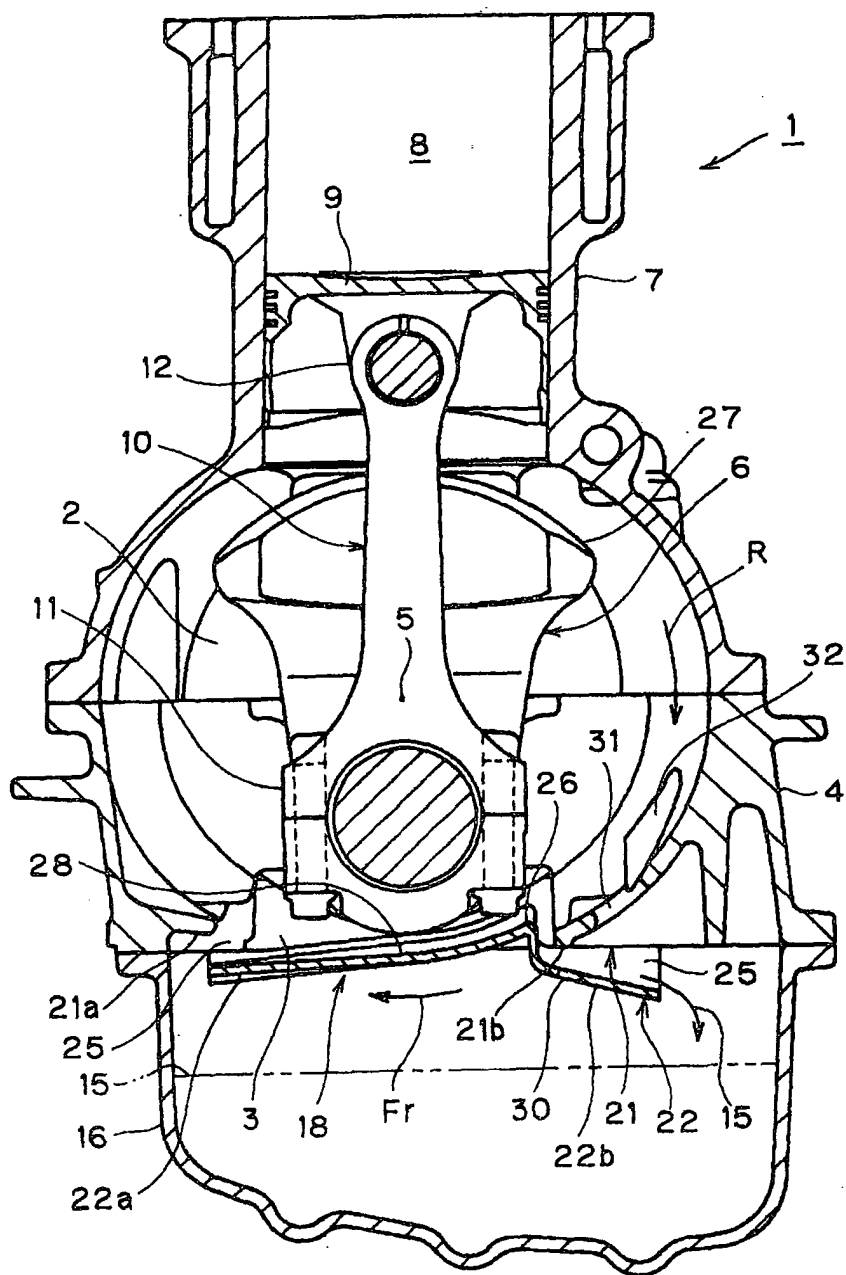


FIG. 1

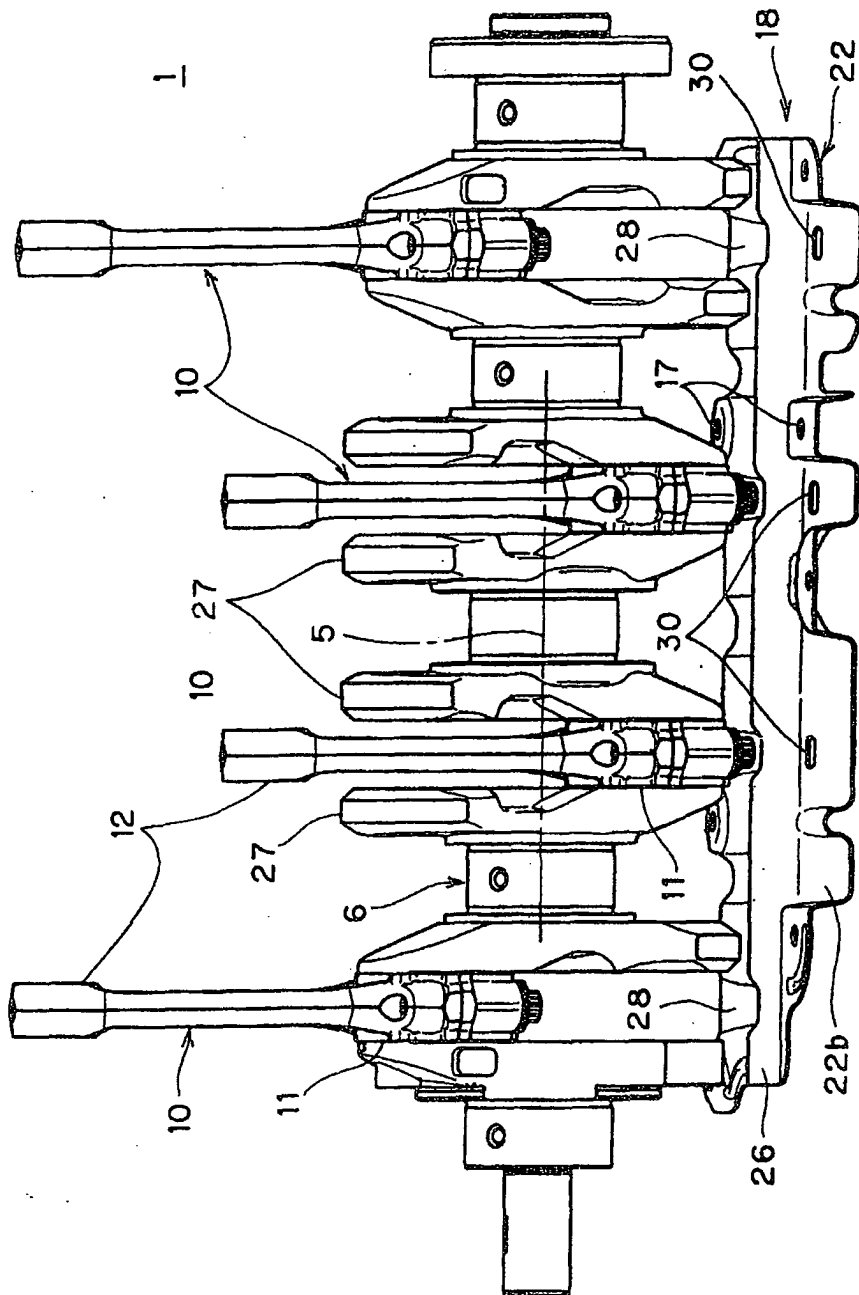


FIG. 2

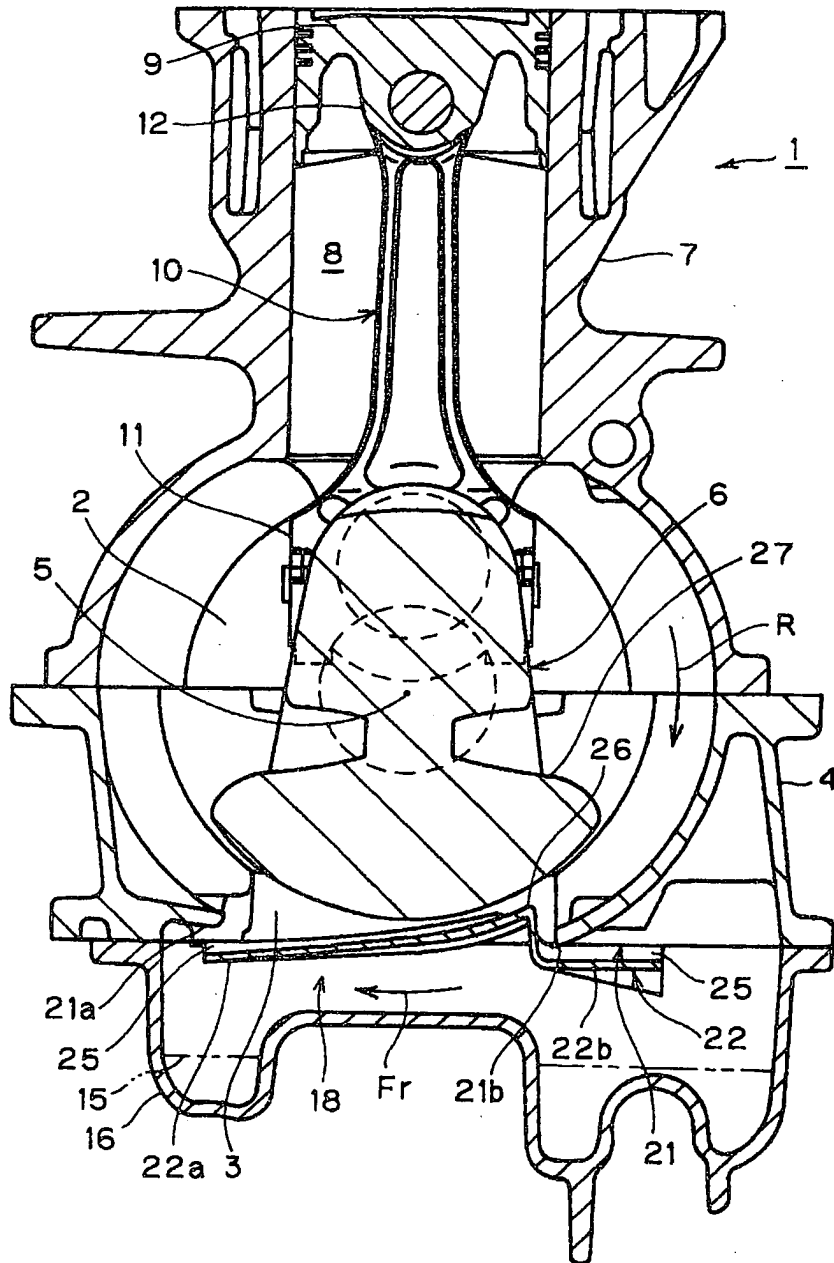


FIG. 3

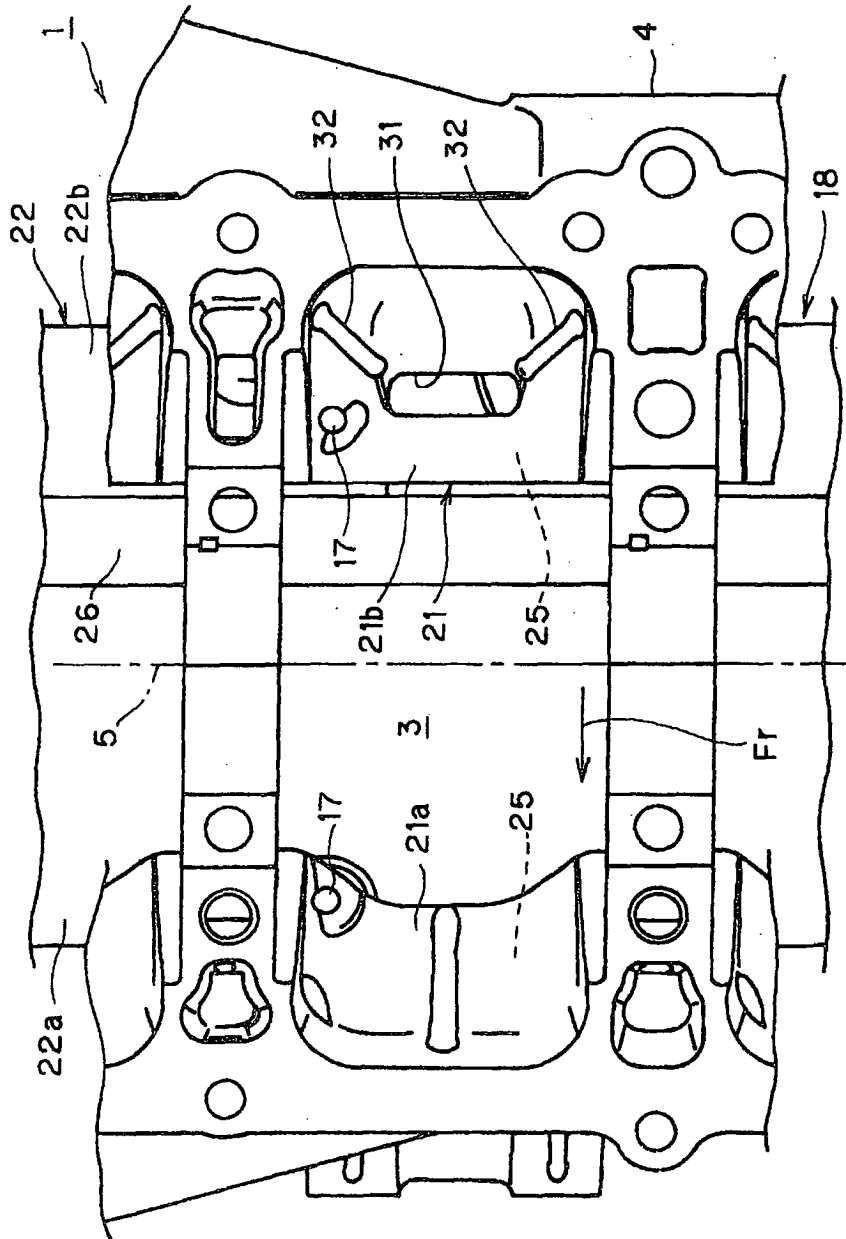


FIG. 4

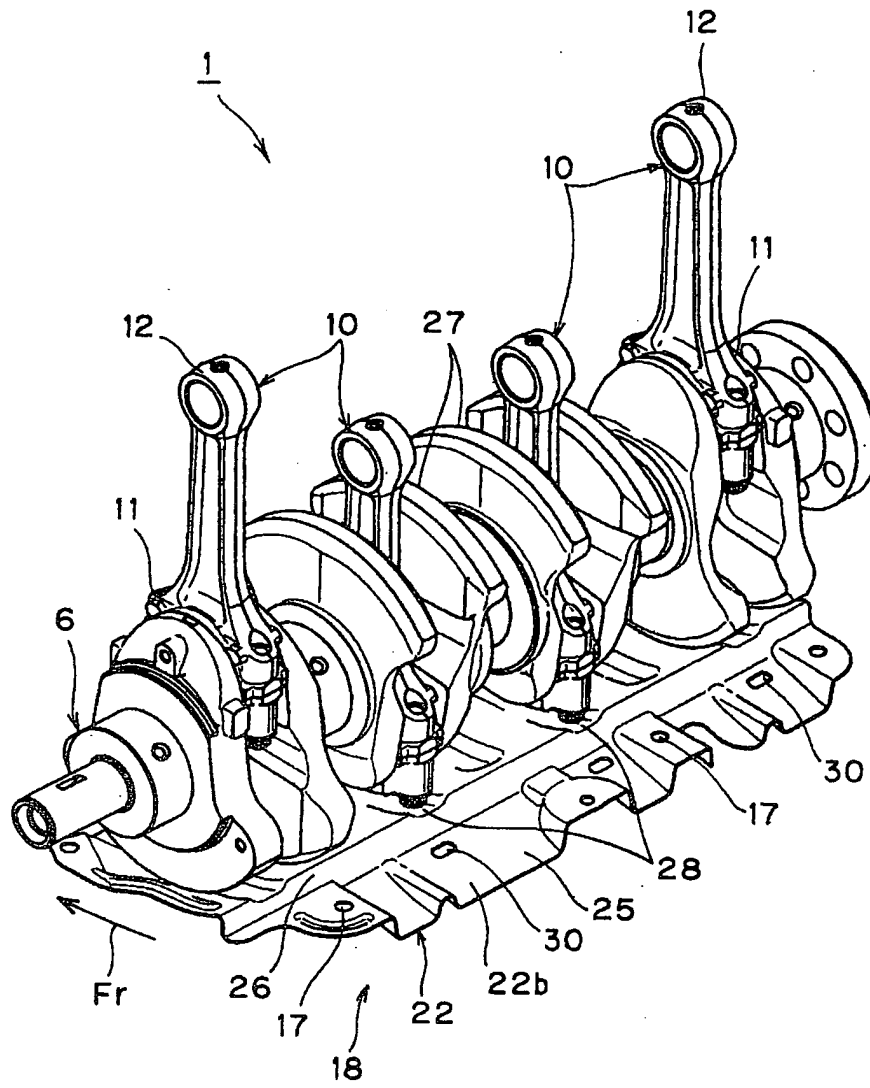


FIG. 5

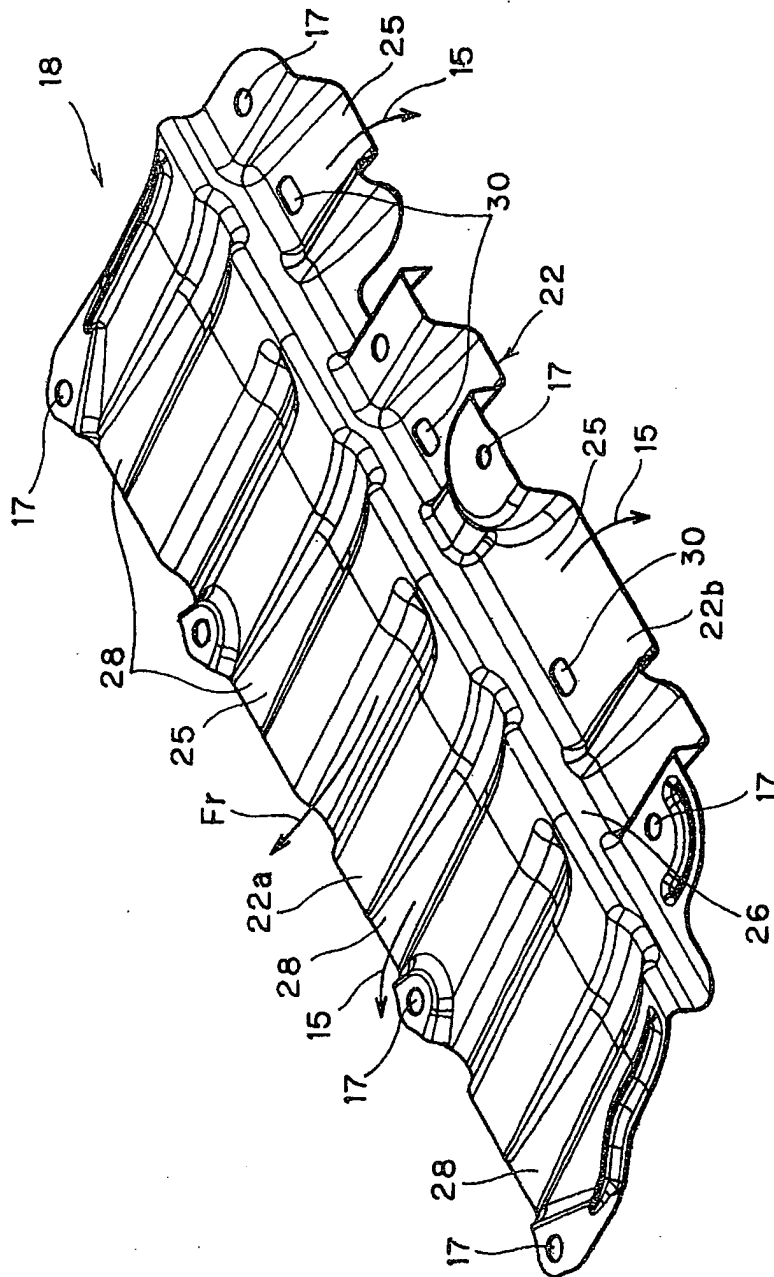


FIG. 6

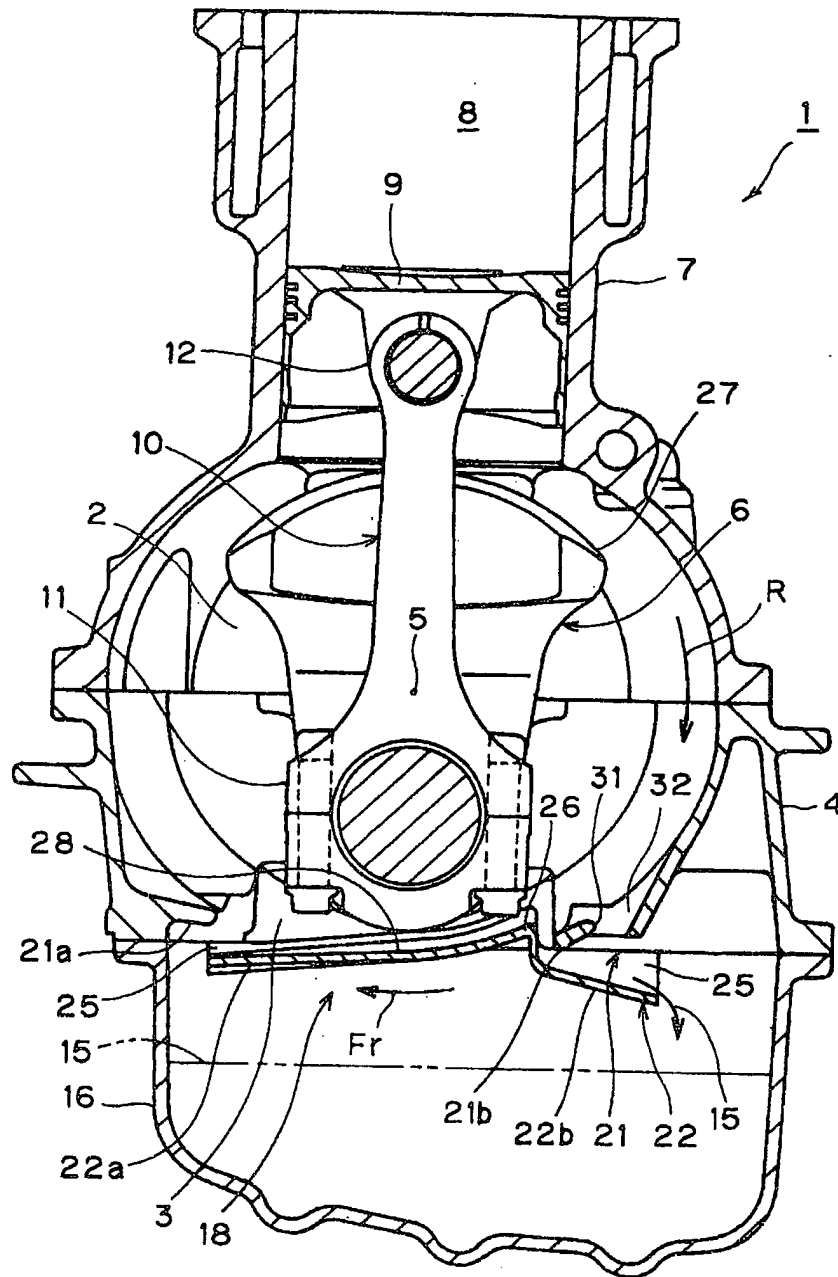


FIG. 7

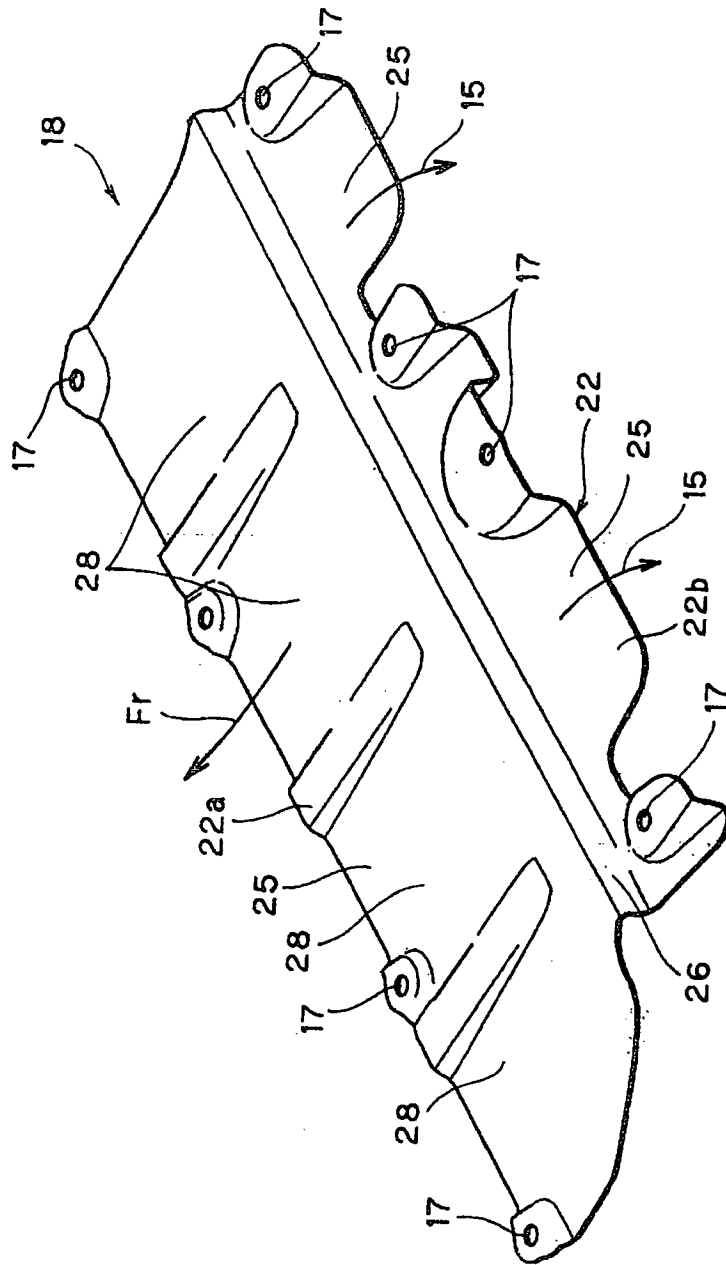


FIG. 8