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SOICHIRO HONDA

3,259,752

PORTABLE ENGINE

Filed Oct. 23, 1963

2 Sheets-Sheet 1

FIG-1

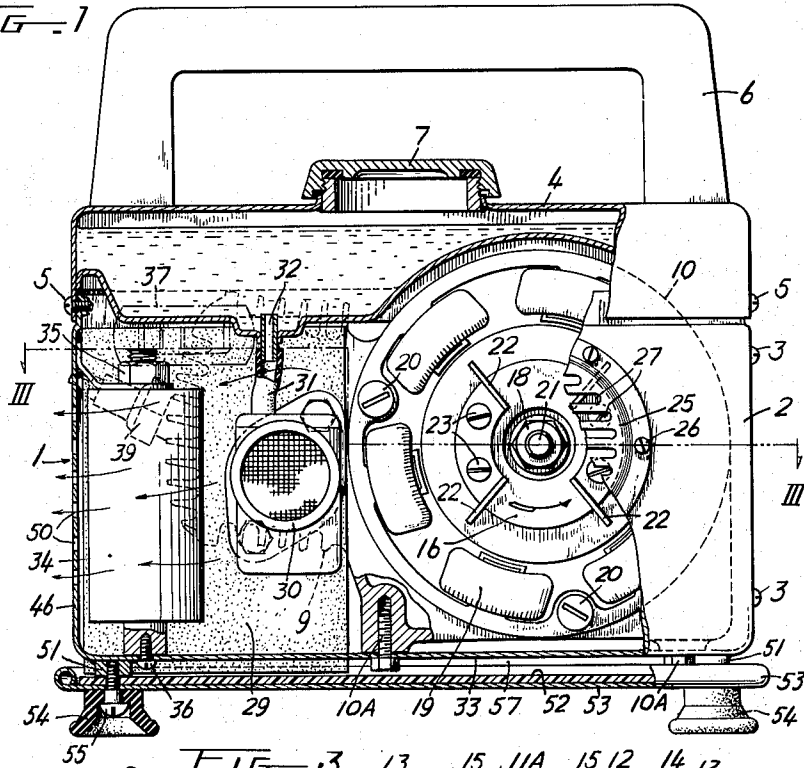
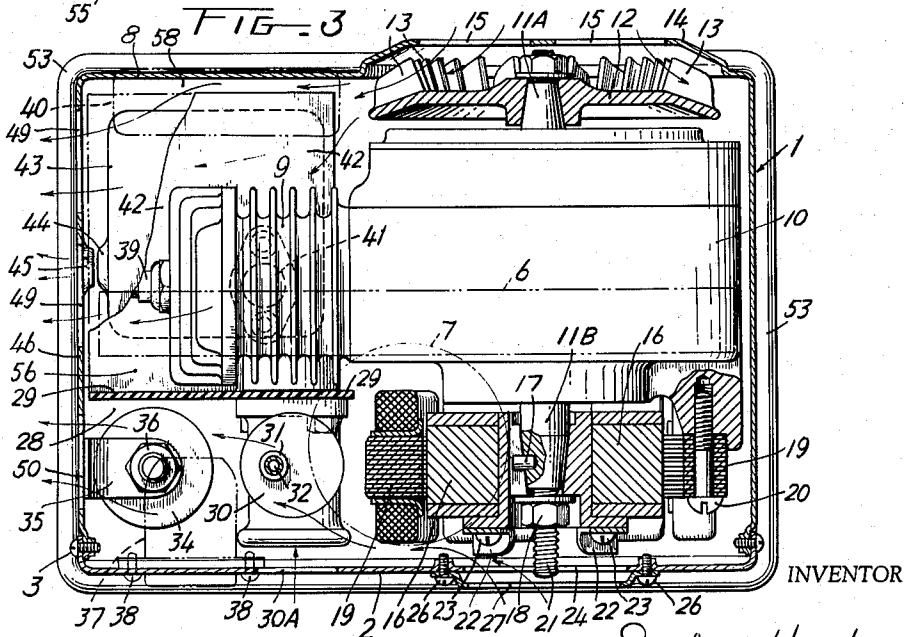


FIG-3



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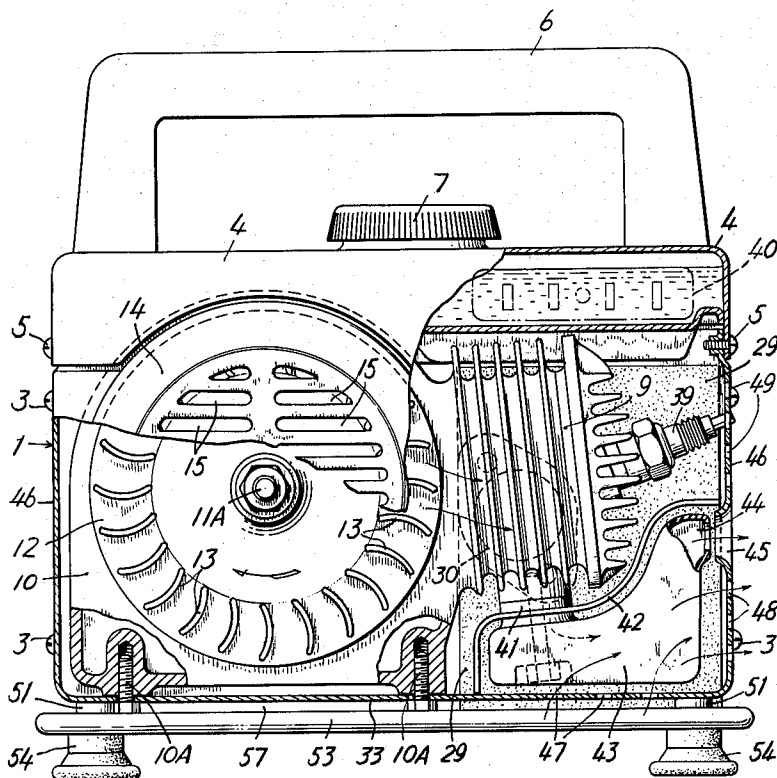
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FIG. 2



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PORTABLE ENGINE

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4 Claims. (Cl. 290—1)

The present invention relates to an internal combustion engine, and more particularly to an engine of such a construction that an engine body, a dynamo, a fuel tank and all other accessories are rationally arranged within a small casing so that the same may be portable and the engine capability may be lowered as little as possible.

According to the present invention, there is provided a portable engine characterized in that a cylinder and a crank chamber are disposed along the longitudinal direction of a casing, and both ends of a crank shaft are provided with a suction fan and a dynamo, respectively, and the casing is provided with a suction opening and an exhaust opening, and a flat fuel tank is attached to the upper surface of the casing.

In order that the invention may be clearly understood and readily carried into effect, the same will now be explained with reference to and by the aid of the accompanying drawings, wherein:

FIG. 1 is a front view of a portable engine embodying the present invention,

FIG. 2 is a rear side view of the same, and

FIG. 3 is a sectional view taken along the line III—III in FIG. 1.

Referring to the drawings, numeral 1 denotes a steel or iron plate made casing which is open at its front and upper surfaces, and a front plate 2 is attached to the front surface thereof detachably by means of screws 3 and 3, and a flat fuel tank 4 is attached to the upper surface thereof detachably by means of screws 5 and 5. Numeral 6 denotes a carrying handle attached to the upper surface of the fuel tank 4, and numeral 7 denotes a closure for an oil charging opening of the fuel tank, which closure 7 is placed deflected slightly from the right below of the handle 6. Numeral 8 is a rear plate of the casing 1.

Within the casing 1 and at a position deflected from the center of the casing towards the rear plate 8, as shown in FIG. 2, an engine body comprising a cylinder 9 and a crank chamber 10 connected thereto is placed in such a manner that the longitudinal direction thereof is substantially in coincidence with the longitudinal direction of the casing 1, and the same is fixed to the bottom plate 33 of the casing 1 by means of a screw 10A. Both ends 11A and 11B of a crank shaft project outwardly from both sides of the crank chamber 10 as shown in FIG. 3, and a suction fan 12 having blades 13 is fixed to the crank shaft end 11A on the rear plate 8 side, and at the position opposed thereto the rear plate 8 is swelled to form a raised plate 14 in which a suction opening 15 is made. A rotor 16 of a dynamo is attached to the other side crank shaft end 11B by means of a pin 17 and a nut 18, and the stator 19 of the dynamo is fixed to the side surface of the crank chamber 10 by means of a screw 20. Numeral 21 denotes a screw rod extending outwardly from the crank shaft end 11B to which is to be attached a transmission wheel or the like for taking out a power. A suction blade 22 is attached to the stator 19 by a screw 23, and at the position opposed thereto a circular opening 24 is made in the front plate 2, and a covering plate 25 therefor is attached thereto detachably by a screw 26. Numeral 27 denotes a suction opening made in the covering plate 25.

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On the side of the stator 19 and between the front plate 2 and the engine 9, a space 28 is formed, and a heat insulating plate 29 which serves also as a partition plate is fixed to the cylinder 9, and a carburetor 30 disposed within the space 28 is fixed through the insulating plate 29 to the cylinder 9. Numeral 56 denotes a space formed on the other side of the partition plate 29. The lower end of this insulating plate 29 pierces through the bottom plate 33 to project out the casing 1. A flexible oil supply pipe 31 projects upwardly from the carburetor 30 for being inserted detachably to an oil supply pipe 32 existing at the bottom surface of the fuel tank as shown in FIG. 1. Within the space 28 and adjacent to the carburetor 30, an ignition coil 34 is fixed to the casing 1 by means of a supporting plate 35 and a screw 36, and an electrical meter 37 is fixed to the front plate 2 by means of a screw 38, and the coil 34 and electrical meter 37 are properly connected to the stator 19 and an ignition plug 39 (FIG. 2) of the engine. If it is intended that the output of the dynamo is taken out, the rear side of the fuel tank 4 is concaved and a plug socket 40 is attached thereto.

In FIG. 2, a muffler 43 is fixed through a heat insulating plate 42 to an exhaust pipe 41, which serves also as an attaching member, of the cylinder 9. Numeral 44 denotes an exhaust opening therefor, and numeral 45 denotes a communication opening made in the side plate 46 of the casing 1 at the position opposed to the opening 44, and numerals 47 and 48 denote ventilation openings for cooling the muffler. As shown in FIGS. 2 and 3, the side plate 46 is provided at the position opposed to the cylinder 9 with an exhaust opening 49, and at the position opposed to the ignition coil 34 with an exhaust opening 50, and the front plate 2 is provided with a suction opening 30A opposed to the carburetor 30.

In FIG. 1, four spacers 51 are fixed to the bottom surface of the bottom plate 33, and a heat insulating plate which is almost equal in size to the bottom plate 33, a receiving plate 53 therefor and four leg pieces 54 are attached to said spacers 51 by means of screws 55. Numeral 57 denotes a space formed between the bottom plate 33 and the heat insulating plate 52. As in the conventional case, the carburetor 30 is provided with a control lever (not shown), and is so constructed that the lever may be operated at the outside of the casing 1.

The portable engine of this invention, as described above, is so constructed that the cylinder 9 and the crank chamber 10 are arranged along the longitudinal direction of the casing 1, and both ends 11A, 11B of the crank shaft are provided with the suction fan 12 and the dynamo 16, 19, respectively, and a flat fuel tank 4 is attached to the upper surface of the casing 1. Its lower surface can be contoured to fit closely over some of the engine components beneath it (see FIGURE 1). This lowers the engine in its center of gravity increasing its stability. Further, this permits more complete utilization of the open space in the engine, thereby allowing the overall size of the engine to be smaller. Casing 1 may be extremely small in size, and the same may be carried freely here and there for being used as a power source of small output power. As the suction fan 12 inhales the air through the suction opening 15 and discharges the same through the exhaust opening 49 for letting the air during its travel to cool the cylinder 9 and the fuel tank 4, no obstruction occurs with the engine operation. Furthermore, the present invention engine can be safe with a user because the whole of the same is covered by the casing 1.

In the present invention engine, furthermore, the cylinder 9 is isolated from the carburetor 30 by the heat in-

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insulating plate 29 and the carburetor 30 is cooled separately from the cylinder 9 by the air taken in by the suction blades 22 through the suction opening 27 to run out through the exhaust opening 50, so that such an obstruction that the temperature of the carburetor is excessively raised to bring such obstacle as vapor lock or the like in the fuel pipe system can be prevented. Furthermore, the cylinder 9 is isolated from the muffler 43 by the insulating plate 42, so that the cylinder 9 may be prevented from being heated by the high temperature of the muffler 43, and the muffler may be cooled by the air flow entering through a slit 58 between the insulating plate 42 and the rear plate 8. Furthermore, in the present invention device, there is provided a heat insulating plate 52 below the bottom plate 33 so that such a danger that a floor is over-heated to be burnt or that other objects catch fire can be prevented and even when a carrying person holds the device on his lap immediately after stopping the operation of the device, he can be prevented from being burnt. The present invention device is especially suitable for such purposes that the same is carried out in the fields to make a drink by the aid of a mixer, or is applied to a portable television set or an electric lamp.

What I claim is:

1. A portable engine comprising, a casing with a cylinder and a crank chamber longitudinally disposed therein; said crank chamber having a crank shaft extending through it; a first suction fan; a first end of said crank shaft being linked to said first suction fan; a dynamo; the other end of said crank shaft being linked to said dynamo; said casing having a bottom surface; a heat insulating plate fixed in spaced relationship with the bottom of said casing and held in spaced relationship by a plurality of spacing members.

2. A portable engine having a casing with a cylinder and a crank chamber longitudinally disposed therein; said crank chamber having a crank shaft extending through it; a first suction fan; a first end of said crank shaft being linked to said first suction fan; a dynamo; the other

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end of said crank shaft being linked to said dynamo; a second suction fan; said other end of said crank shaft also being linked to said second suction fan; a carburetor to feed fuel to said cylinder; a heat insulating shield placed between and spaced away from said cylinder and said carburetor; two separate chambers formed by said heat insulating shield within said casing; each chamber having its own suction and exhaust openings.

3. A portable engine comprising a cylinder, a crank chamber and a power output means; said engine being surrounded by a casing; said casing having a fuel tank comprising a large portion of the upper covering for said casing; said fuel tank having a lower surface contoured to fit closely over the top of a number of the engine components disposed beneath it.

4. A portable engine comprising a cylinder, a crank chamber and a power output means; said engine being surrounded by a casing; said casing having a fuel tank comprising a large portion of the upper covering for said casing; said power output means comprising a dynamo linked to and driven by said cylinder through said crank chamber; and an electric outlet electrically linked to said dynamo for drawing electric current from said dynamo.

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