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(54) Air cleaner for use with a portable engine.

(57) An air cleaner (47) having a main casing (309) fixed to a suction port (305) of a carburettor (49), a cap casing (319) removably fitted to said main casing (309) and a filter made (315) of porous material which is held between the main casing (309) and the cap (319). The air cleaner (47) comprises a space portion (389) provided in one of said main casing (309) and said cap casing (319) for receiving the filter (315). Furthermore, support legs (331, 333) are provided which project inside the space portion (329) for being inserted into fitting holes (335) which pass through the filter (315).

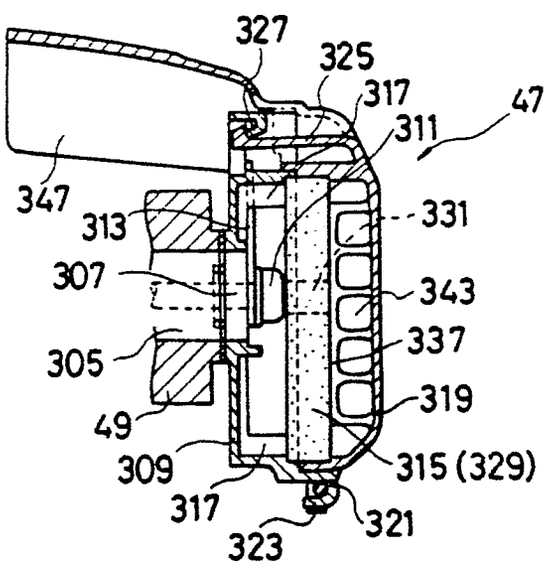

FIG.2

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AIR CLEANER FOR USE WITH A PORTABLE ENGINE

The present invention relates to an air cleaner and in particular to an air cleaner for a portable engine adopted for a portable working apparatus such as a weed cutter.

In particular, the present invention relates to an air cleaner which comprises a main casing fixed to a suction port of a carburettor of a portable engine, a cap casing being removably fitted to said main casing, said filter being held between the main casing and the cap casing.

In conventional air cleaners of this type, the filter will be lost when the cap casing is removed from the main casing. To prevent this, in conventional air cleaners the periphery of the filter is formed larger than the inner diameter of a space portion for receiving the filter to compress the periphery of the filter when it is pushed into said space portion, thereby holding the filter. To maintain a predetermined supporting force at the periphery of such an oversized filter, it is necessary to enlarge a dimensional difference between the periphery of the filter and the inner diameter of the space portion to increase the compression dimension. Due to this, the filter however may protrude from said space portion, or wrinkles may be formed on the surfgace of the filter, thereby causing deformation of the filter.

It is an object of the present invention to arrive at an improved air cleaner in which the filter is securely held when the cap casing is opened and in which the filter is not deformed. Furthermore, it is an object of the present invention to arrive at an air cleaner into which the filter can be easily installed and from which the filter can be easily removed.

The above object of the present invention is achieved by the subject matter of claim 1.

Further improvements and preferred embodiments of the inventive air cleaner are defined in the sub-claims.

The inventive air cleaner is not restricted to a use in connection with portable engines but can be used with engines of different types.

One way of carrying out the invention is described in detail below with reference to drawings which illustrate only one specific embodiment, in which:

Fig 1 is a front view, partly broken, showing an air cleaner connected to a portable engine;

Fig 2 is a cross-sectional view showing the details of the air cleaner;

Fig 3 is an external view showing the air cleaner; and

Fig 4 is a cross-sectional view showing the air cleaner.

In Fig 1 there is shown a portable engine comprising an air filter according to an embodiment of the present invention. As shown in Fig 1, an engine cylinder 5 is fixed on top of a crankcase (not shown). Reference numeral 15 depicts a centrifugal clutch which is fitted to the front side of a magnet wheel (not shown).

A fan 23 having a plurality of fins is fixed to the rear side of the magnet wheel and a fan cover 25 for covering the fan 23 is fixed to the front side of the crankcase to guide a blow of the fan 23 first upwards and then rearwards. A cylinder cover 29 covers both sides of the engine cylinder 5 and is positioned in series with the fan cover 25 to guide the blow towards the periphery of the engine cylinder 5.

A partition 33 for covering a step formed on one side of the fan cover 25 and the cylinder cover 29 is integrally formed with the cylinder cover 29. A partition 35 for covering another step formed on the other sides of the fan cover 25 and the cylinder cover 29 is integrally formed with one side of the crankcase and projects upwards. An ignition coil 37 has an iron coil 39 which is fixed to the partition 35 by screws 41. The current of the ignition coil 37 is transmitted through a code 43 on an ignition plug 45 located on top of the engine cylinder 5, and discharged from the ignition coil 37.

A carburettor 49 having an air cleaner 47 is fitted to one side of the engine cylinder 5, and a muffler cover 51 including a muffler (not shown) is fitted to the other side of the engine cylinder 5.

Figs 2 and 4 show the details of the air cleaner 47. A main casing 309 of the air cleaner 47 has an opening 307 which communicates with a suction port 305 of the carburettor 49. The casing 309 is fixed to the carburettor 49 with bolts 311. A choke valve 313 is fitted by a bolt 311 and opens and closes the opening 307. Ribs 317 are formed inside the casing 309 to support a felt like or sponge like porous filter 315. A cap casing 319 is removably fitted at its lower end to a fitting portion 323 of the main casing 309 by a fitting pin 321 to hold the filter 315. A hook 325 projecting from the tope of the cap casing 319 is stopped by a stopping portion 327 of the main casing 309 due to the resiliency. A space 329 for receiving the filter 315 is fomed in the cap casing 319. Supports 331 and 333 projecting inside the cap casing 319 are removably inserted into holes 335 which are formed to pass through the filter 315. The filter 315 is held by a partition 337 for separating a part of the

interior of the cap casing 319, by a step 339 of the support 333, and by the main casing 309. A muffling chamber 343 is formed between the cap casing 319 and an outer wall 341 to communicate a chamber 345 of the cap casing 319 with the atmosphere. A cover 347 for covering the top of the carburettor 49 is fixed to the upper part of the cap casing 319.

According to the above arrangement, the atmosphere enters into the chamber 345 through the muffling chamber 343 according to the suction force of the engine, and is sucked by the suction port 305 of the carburettor 49 through the filter 315 and the opening 307. The filter 315 may be removed by removing the hook 325 from the stopping portion 327 with fingers and by turning the cap casing 319 around the pin 321. The filter 315 is then taken out and cleaned. To install the filter 315, the cap casing 319 is kept to be opened, and the fitting holes 335 of the filter 315 are pushed toward the supports 331 and 333 of the cap casing 319 to place the filter 315 in the space 329. After than, the cap casing 319 is closed, and the hook 325 is engaged with the stopping portion 327.

Since the inventive air cleaner is constituted as described above, the filter is not deformed, held securely when the cap casing is opened, thereby ensuring that the filter will not drop. Furthermore, the filter is easy to install and easy to remove.

Claims

1. Air cleaner (47) for use in a portable engine having a main casing (309) fixed to a suction port (305) of a carburettor (49), a cap casing (319) removably fitted to said main casing (309), and a filter (315) made of porous material and held between said main casing (309) and said cap casing (319), comprising:
a space portion (329) provided in one of said main casing (309) and said cap casing (319) for receiving said filter (315); and
support legs (331; 333) projecting inside said space portion (329) to be inserted into fitting holes (335) which pass through said filter (315)

2. Air cleaner according to claim 1 having a partition (337) for separating a part of the interior of the cap casing (319); a muffling chamber (343) formed between the cap casing (319) and an outer wall (341) to communicate a chamber (345) of said cap casing (319) with the atmosphere.

3. Air cleaner according to claim 1 or claim 2 wherein said cap casing (319) is removably fitted to a fitting portion (323) of the main casing (309) by a fitting pin (321) to hold said filter (315).

4. Air cleaner according to one of the foregoing claims, wherein a hook (325) projecting from the top of said cap casing (319) co-operates by a stopping portion (327) of said main casing (309).

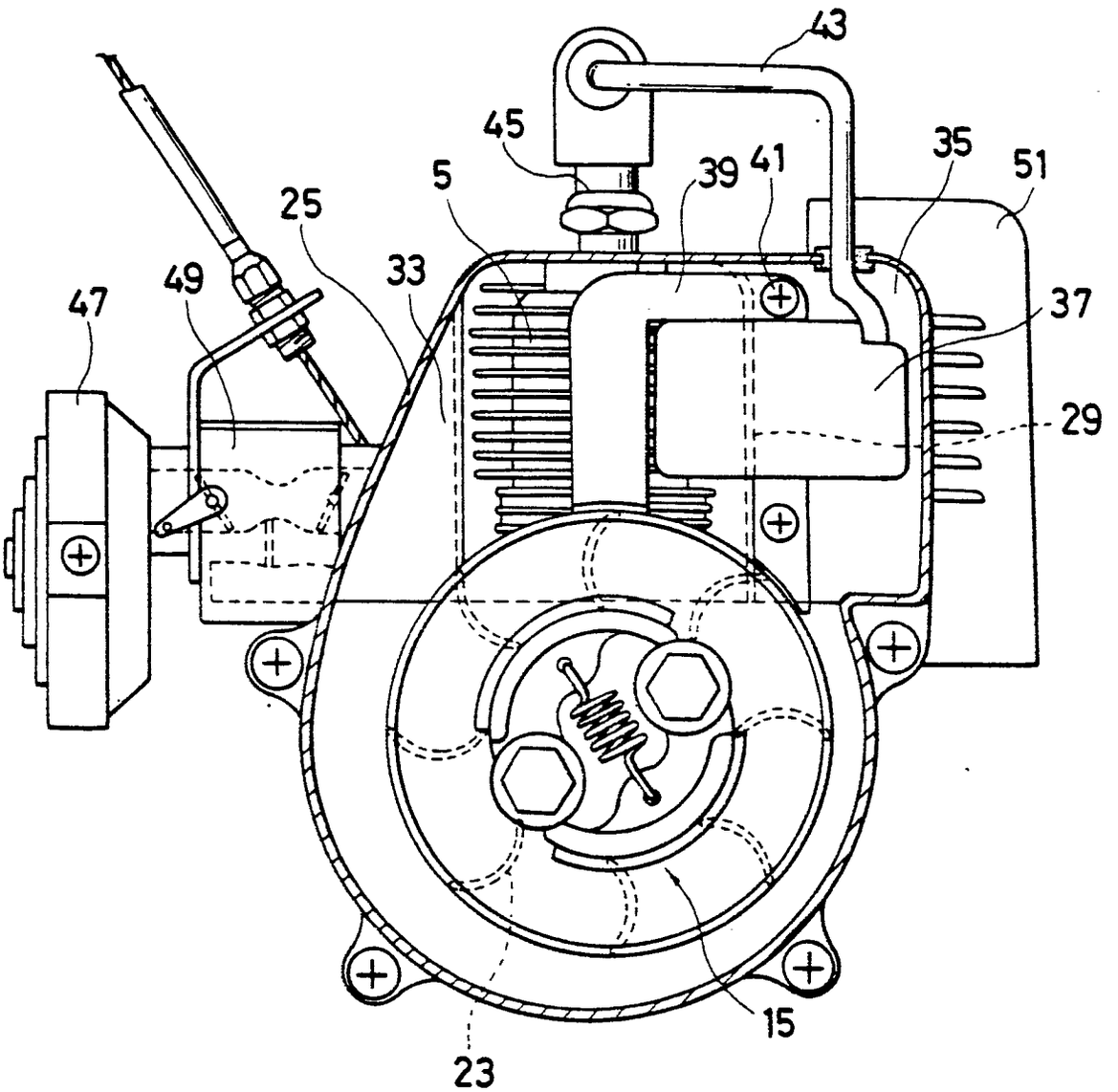

FIG.1

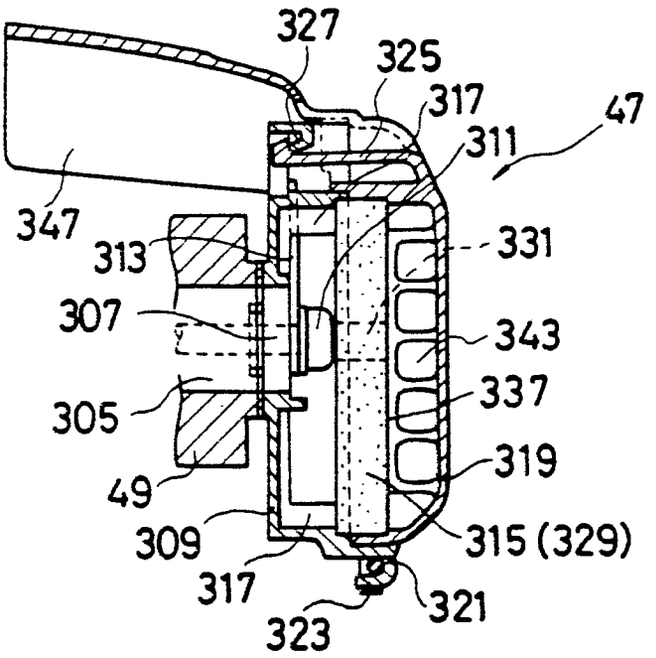
327
325
317
47
311
347
313
331
307
343
337
305
319
49
309
315 (329)
317
321
323

FIG.2

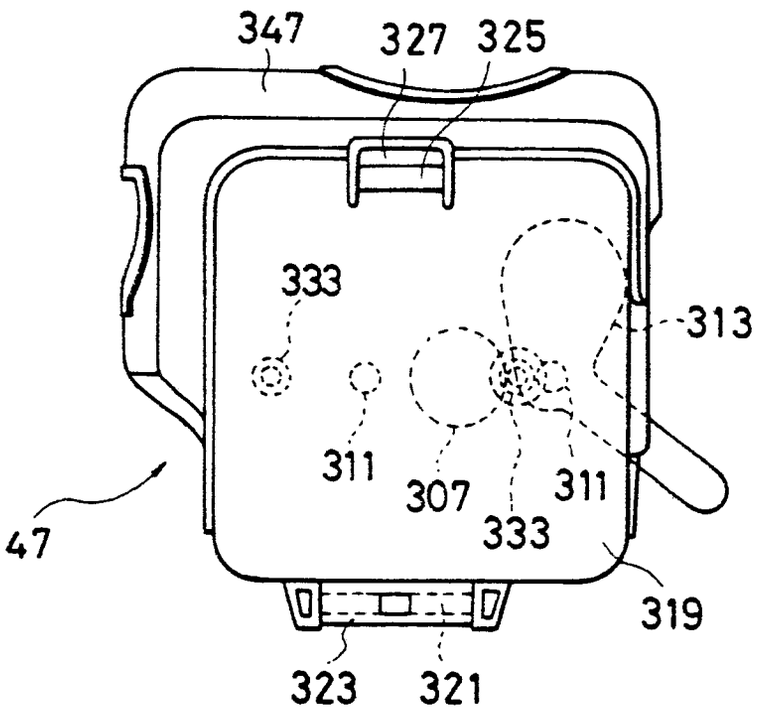
347
327
325
333
313
311
307
311
333
47
319
323
321

FIG.3

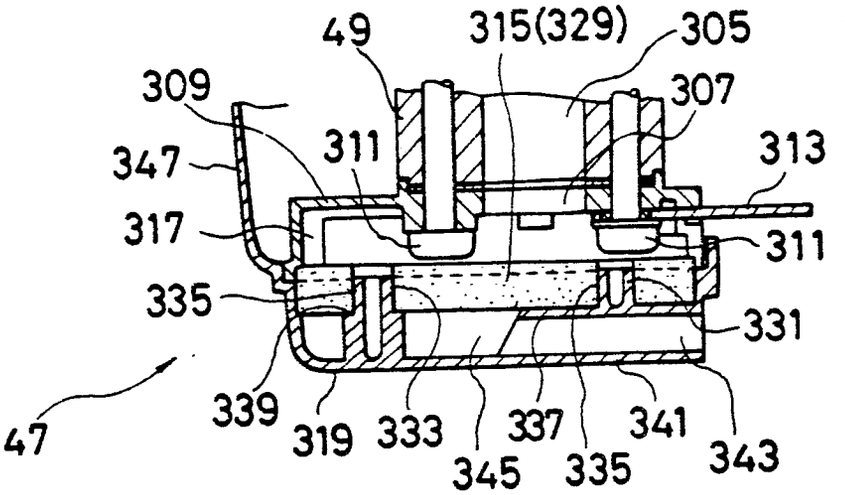
49
315(329)
305
309
307
311
313
347
317
311
335
331
47
339
319
333
345
337
335
341
343

FIG.4

European Patent Office

EUROPEAN SEARCH REPORT

Application number

DOCUMENTS CONSIDERED TO BE RELEVANT

EP 88121325.0

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	GB - A - 1 454 543 (TUIN) * Totality * --	1	F 02 M 35/04
A	FR - A - 855 739 (ERNST) * Totality * --	1-3	
A	GB - A - 936 777 (GENERAL MOTORS CORPORATION) * Totality * --	1	
A	US - A - 2 999 562 (LECHTENBERG) * Totality * --	1	
A	GB - A - 1 075 376 (GENERAL MOTORS LIMITED) * Totality; especially fig. 5 * --	1	TECHNICAL FIELDS SEARCHED (Int. Cl.4) F 02 M 35/00
A	GB - A - 1 096 971 (TECALEMIT (ENGINEERING) LIMITED) * Totality * --	1,2	
A	GB - A - 974 104 (SIMMS MOTOR UNITS LTD., FRIEDLANDER) * Totality; especially numeral 15a * ----	1,4	

REFUND: 25 %

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	13-03-1989	PIPPAN

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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