(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 285 077**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **88105003.3**

(51) Int. Cl.⁴: **F02M 9/06**

(22) Date of filing: **28.03.88**

(30) Priority: **02.04.87 IT 1994087**

(43) Date of publication of application:
05.10.88 Bulletin 88/40

(84) Designated Contracting States:
AT BE CH DE ES FR GB GR LI LU NL SE

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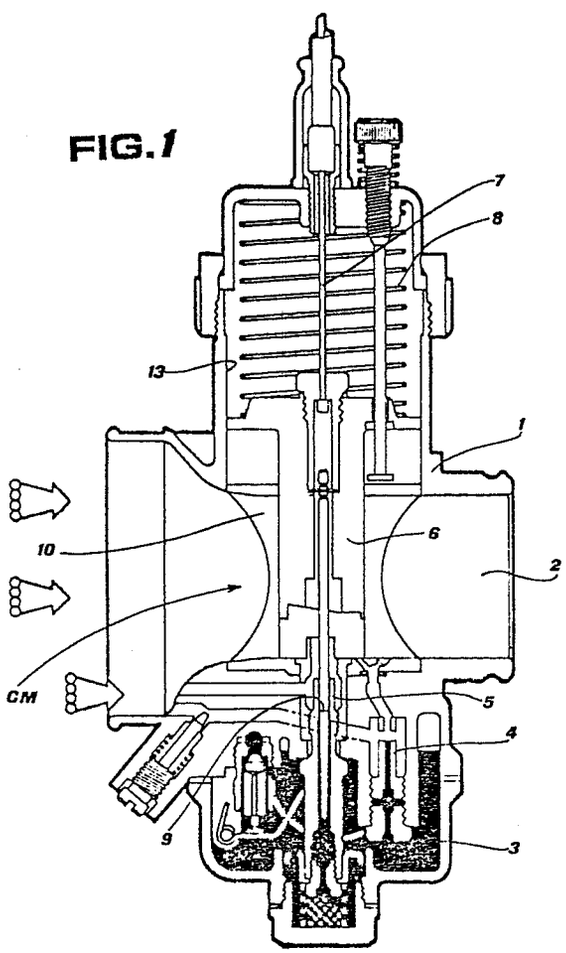
(54) Improved carburator for internal combustion engines.

(57) In a carburetor for two-stroke or four-stroke internal combustion engines, particularly for motorcycles, the gate valve (6) is formed as a disc (11) with cylindrical wall (12), from which a flat plate (14) diametrically projects perpendicularly thereto, and an inserted choke (10) is associated to the carburetor body, into which slots (19) are formed for guiding and retaining said plate (14).

FIG.1



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IMPROVED CARBURETOR FOR INTERNAL COMBUSTION ENGINES

The present invention concerns improvements in carburetors of the needle type with gate valve, for two-stroke or four-stroke internal combustion engines, especially for motorcycles.

It is known that in conventional needle-type carburetors, for use in two-stroke or four-stroke engines for motorcycles, the metering of the fuel mixture required for the running is controlled by a gate valve which chokes the amount of air supplied to the cylinders and which simultaneously provides to meter the fuel let into the main duct of the carburetor by means of a cylindrical rod with variable diameter ("needle"), connected to the valve with its thicker upper part and having the thinner opposite end (pointed) sliding into the calibrated hole of fuel inflow.

If this configuration is used, the air sucked by the engine increases its own speed, particularly in the area underlying the valve, and this speed increase turns into a pressure fall which causes the inflow of fuel through said calibrated hole.

It is equally known that a good fuel atomization - of fundamental importance for the proper running of the engine - greatly depends on the geometrical configuration of the carburetor area wherein the gate valve acts, and particularly on that of the lower part of said valve. In fact, especially in the case of ducts and valves of large dimensions, the fuel jet let into the duct may, in its flow, be obstructed by the valve and settle thereon by condensing in the form of small drops which deteriorate the atomizing. The need hence arises to reduce the dimensions of the gate valve in the direction of fluid flow.

Up to date, gate valves for this type of carburetors have essentially been cylindrical and flat. The cylindrical valves provide the considerable advantages of an improved distribution of the force transmitted by the spring closing the valve (and, thus, of an improved adjustment of the gas metering by the driver), and of an easier working (with conventional methods) of the mixing chamber (area of intersection between the main duct of the carburetor and the valve guide) and of the valve seat; but also the serious drawback that, as the mixture starts to come out of the full power jet - when the valve is slightly open - it may easily hit against the lower rim of the cylindrical body forming the valve itself, thereby causing dripping, condensation and, consequently, difficult and bad atomization; this fault then shows up most seriously (lack of progression) just when the best carburetion is required from the engine, that is, during pickup and sudden acceleration, and it is all the more emphasized the larger the duct of the carburetor and the diameter of the cylindrical valve. On the other hand, flat valves provide the drawbacks of a worse distribution of the force transmitted by the spring closing the valve, and of a more complicated and difficult (as well as less conventional) working of the mixing chamber and of the valve seat, whereas - thanks to the geometry of the actual valve - the mixture jet is very conveniently prevented from hitting against the same.

The object of the present invention is to avoid the drawbacks of either types of valves, while preserving their advantages, that is, to realize a carburetor having a gate valve providing for a proper distribution of the force transmitted by the valve closing spring, providing for an easy and simple working of the metering chamber and of the valve seat, and allowing to prevent any hitting of the mixture jet - especially when the valve is only slightly open - against the walls of the actual valve (thus consequently preventing drippings, condensation and bad atomization of the mixture being fed to the engine).

These results are efficiently obtained with a carburetor of the type wherein the main duct is intercepted, for adjustment purposes, by a gate valve subjected to the action of a closing spring in correspondence of mixture inlet into said duct, and wherein to said valve there is associated a needle to adjust the mixture inlet flow, characterized in that said gate valve is formed by a disc with cylindrical wall, which moves into a seat of corresponding shape and is subjected to the pressure of the closing spring, and by a flat plate projecting diametrically and perpendicularly from said disc, to which it is fixedly connected, and in that an inserted choke is associated to the carburetor body, into which slots are formed for guiding and retaining said flat plate of the gate valve. Preferably, said flat plate is formed of a pair of interconnected flat walls, the cylindrical wall disc and the flat plate projecting therefrom can form a single piece obtained by casting, and the inserted choke is also formed by casting. As well as of metal, these members or parts thereof can be of suitable synthetic plastic material.

The invention is now described in further detail, by mere way of example, with reference to a preferred embodiment thereof, illustrated by the accompanying drawings, in which:

Fig. 1 is a sectional view of the carburetor according to the invention;

Fig. 2 is an enlarged scale perspective view of the improved gate valve of the carburetor of figure 1; and

Fig. 3 is a similar view of the inserted choke of the same carburetor.

With reference to the drawings, in a carburetor of the needle type with gate valve, the carburetor body is indicated by 1, its main duct by 2, the constant level float chamber by 3, the idling jet by 4 and the full-power diffuser by 5. The carburetor is equipped with a gate valve 6 onto which act, for its opening, a control cable 7 controlled by the accelerator and, for its closing, a helical spring 8; to the valve 6 there is fixedly connected a needle 9 which penetrates in known manner into the full-power diffuser 5. Reference CM indicates the carburetor mixing chamber, formed by the inserted choke 10 applied centrally into the carburetor body 1.

As shown in figures 2 and 3, the gate valve 6 of the carburetor according to the invention comprises a disc 11 with cylindrical wall 12, onto which bears (as onto a conventional cylindrical valve) the spring 8, and which slides (like a conventional cylindrical valve) into a corresponding cylindrical seat 13 of the carburetor, perpendicular to the main duct 2. To the valve 6 there is associated a flat plate 14 projecting diametrically and perpendicularly from its disc 11. Further-more, the end of the needle 9 connected to the valve 6 projects beyond said plate 14, centrally thereto.

In the embodiment shown, the plate 14 is formed of two flat parallel walls 15 and 16, mutually connected by a central bridge 17 housing the needle 9, and fixedly connected to the disc 11.

The inserted choke 10 - formed separately, preferably by casting - is inserted at the centre of the carburetor body 1, with which it forms the mixing chamber CM. It comprises ports 18, forming the duct 2, and two pairs of guide slots 19, into which are inserted and tightly slide the two flat walls 15 and 16 forming the plate 14 of the valve 6.

Preferably, the disc 11, the walls 15 and 16, and the bridge 17 of the plate 14 of the valve 6, are formed in one piece by casting of metallic material. Nevertheless, the valve 6 could be differently obtained and could suitably comprise at least some parts of synthetic plastic material. Even the inserted choke 10 could be made from synthetic plastic material.

The wall 15 of the plate 14 of the gate valve 6 comprises a known type recess 20, on the air inlet side, for forming the mixture.

From the accompanying drawings and the previous description, it can be understood at once that the carburetor according to the invention provides all the advantages of those with cylindrical valve and of those with flat valve, without having their defects. The arrangement of the invention in fact combines an efficient bearing of the valve closing spring and an easy working of the valve seat, typical of carburetors with cylindrical valve, with a good atomization in each working step, which is typical of carburetors with flat valve: moreover, without having to resort to a complicated working or having to face problems connected with valve closing, it is possible to prevent dripping and condensation of the mixture on the valve itself.

Claims

1) Carburetor for internal combustion engines, of the type wherein the main duct is intercepted, for adjustment purposes, by a gate valve subjected to the action of a closing spring in correspondence of mixture inlet into said duct, and wherein to said valve there is associated a needle to adjust the mixture inlet flow, characterized in that said gate valve is formed by a disc with cylindrical wall, which moves into a seat of corresponding shape and is subjected to the pressure of the closing spring, and by a flat plate projecting diametrically and perpendicularly from said disc, to which it is fixedly connected, and in that an inserted choke is associated to the carburetor body, into which slots are formed for guiding and retaining said flat plate of the gate valve.

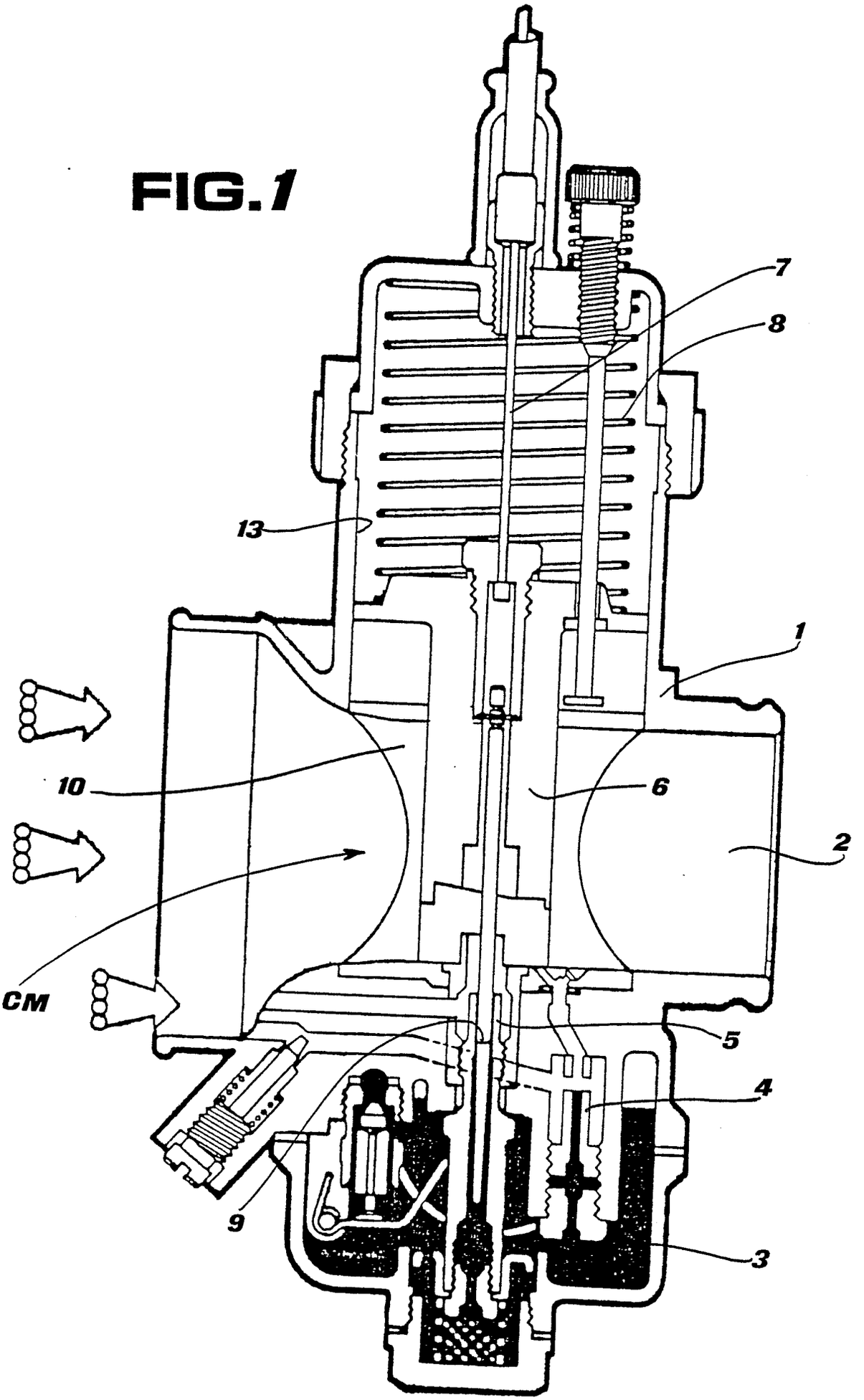
2) Carburetor as in claim 1), wherein said flat plate of the valve is formed of a pair of interconnected flat walls.

3) Carburetor as in claim 1), wherein the cylindrical wall disc and the flat plate of the valve form a single piece obtained by casting.

4) Carburetor as in claim 1), wherein said inserted choke is formed by casting.

5) Carburetor as in claims 1) to 4), wherein said valves and said inserted choke are at least partly formed from synthetic plastic material.

FIG.1



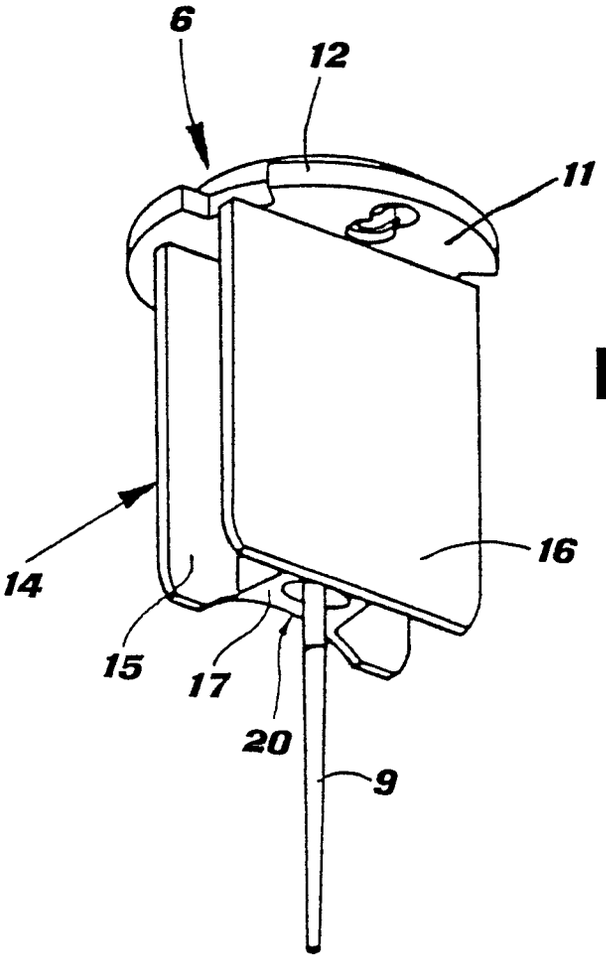


FIG. 2

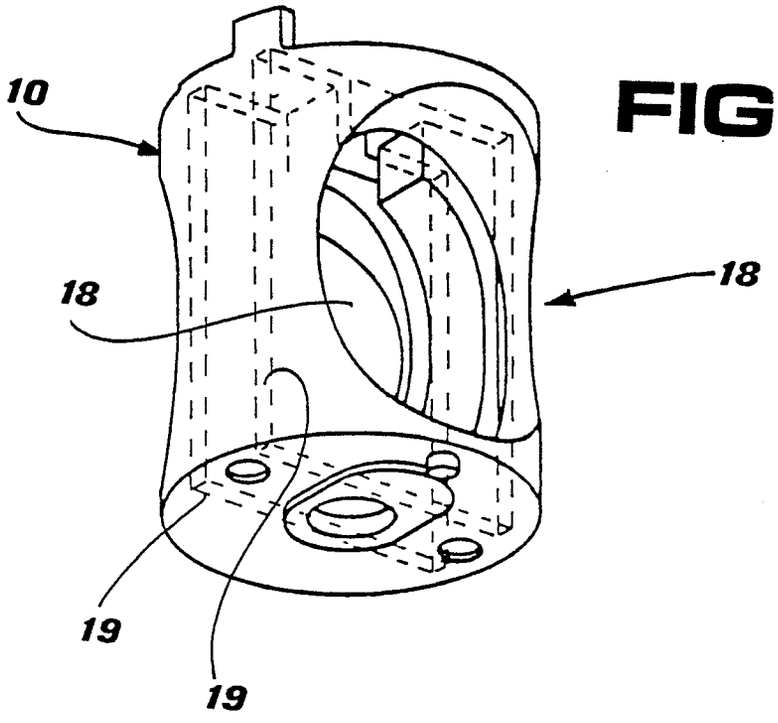


FIG. 3

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EUROPEAN SEARCH REPORT

Application Number

EP 88 10 5003

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	DE-A-3 019 065 (EDMONSTON) * Page 12, last paragraph; page 13; page 14, lines 1-5 - last line, page 15; page 16, lines 1,2; figures 1-6 *	1,2	F 02 M 9/06
A	---	3	
Y	DE-A-2 222 104 (FORD) * Page 5, last 2 paragraphs; page 7, last 9 lines of the 1st paragraph; figures 1-3 *	1,2	

Y	DE-B-1 238 719 (GURTNER) * Page 1, right-hand column, lines 45-52; figure 1 *	1,2	

A	PATENT ABSTRACTS OF JAPAN, vol. 9, no. 313 (M-437)[2036], 10th December 1985; & JP-A-60 147 560 (SUMITOMO BAKELITE K.K.) 03-08-1985 * Abstract *	5	
	---		TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	GB-A- 280 028 (BROWN & BARLOW) * Page 3, lines 79-130; page 4, lines 1-14,49-62 *	1	F 02 M

A	FR-A- 950 064 (WEBER)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	08-07-1988	JORIS J.C.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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