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Schneider et al.

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[54] **CARBURETOR CONSTRUCTION TO ELIMINATE FUEL ACCUMULATION AT THE REED VALVE**

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[52] **U.S. Cl.** .....**123/73 V,** 123/73 A

[51] **Int. Cl.**.....**F02b 33/04**

[58] **Field of Search**.....123/73, 73 V, 73 A, 74; 261/DIG. 55; 137/513.7, 513.3

[56] **References Cited**

UNITED STATES PATENTS

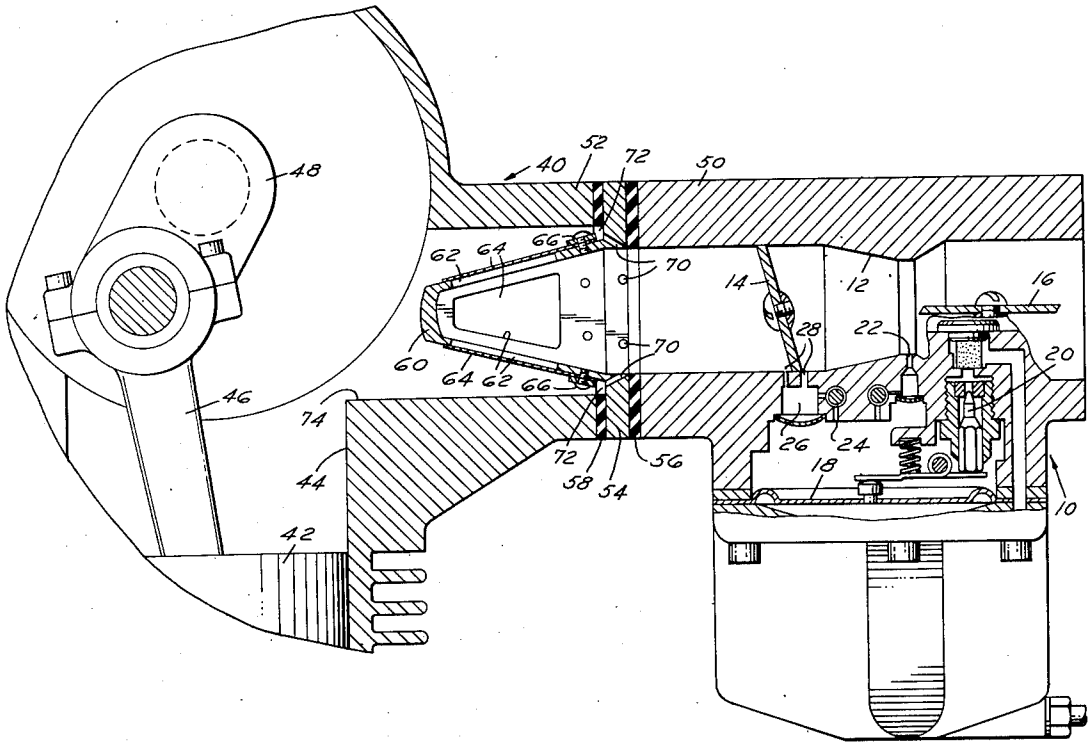
1,788,358	1/1931	Goerg	137/513.7
2,214,290	9/1940	Ward	137/513.7
1,092,279	4/1914	Martin et al.	261/DIG. 55
1,585,142	5/1926	Gillett	261/DIG. 55
1,600,007	9/1926	Mock	261/DIG. 55
2,093,960	9/1937	Ericson	261/DIG. 55
3,353,525	11/1967	Nutten et al.	123/73 X
3,361,120	1/1968	Schneider	123/73

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[57] **ABSTRACT**

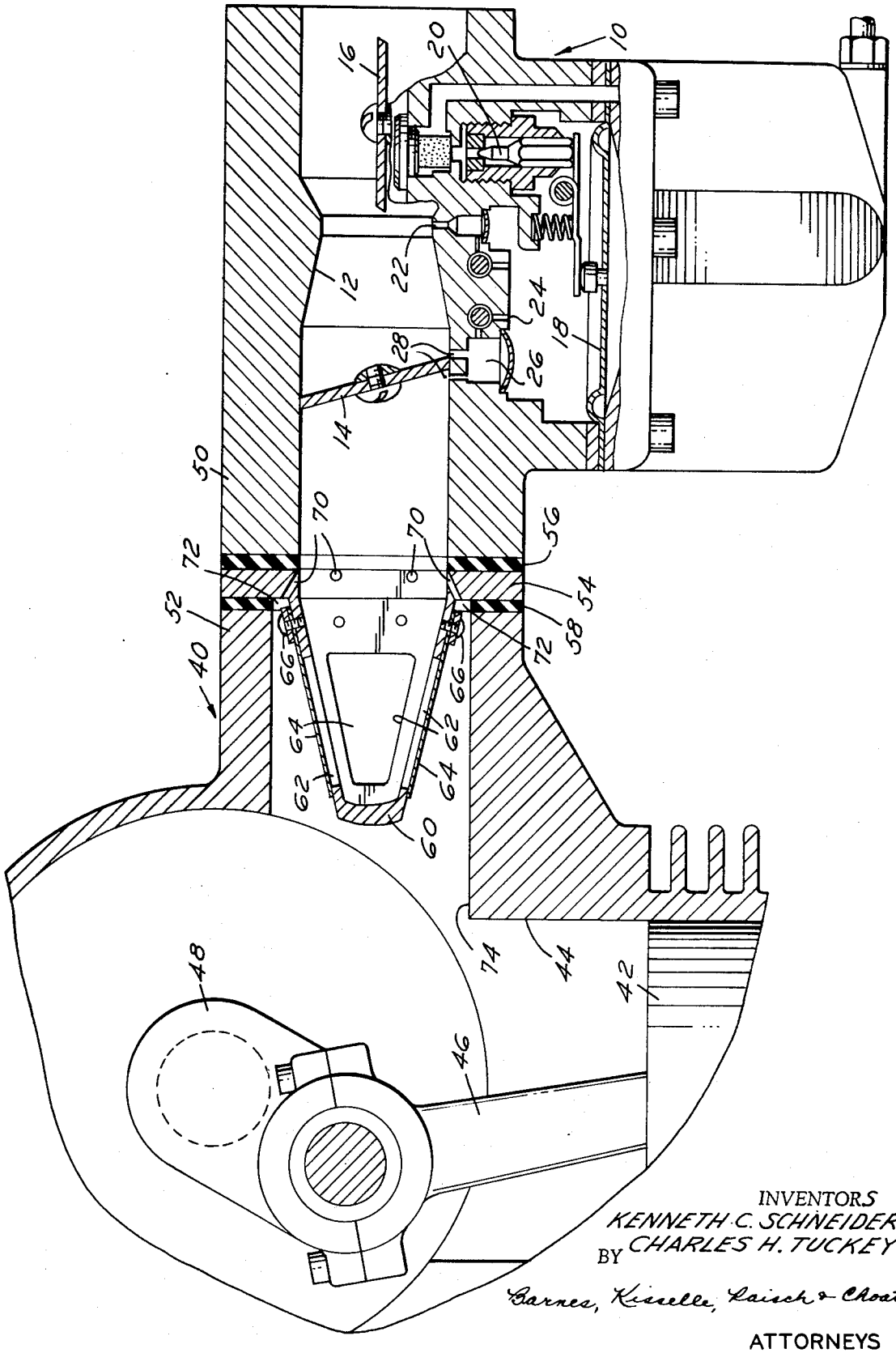
A uni-directional valve arrangement for two-cycle internal combustion engines which eliminates undesirable collection of pockets of fuel in the carburetor system and the resultant undesirable running characteristics, this being accomplished by venting from the mixing chamber of the carburetor system directly to the areas surrounding the unidirectional or "reed" valves so that an air fuel mixture moves through the restricted and dead pocket areas to keep them clean of fuel collections, thus preventing overrich comedown when a throttle is closed and preventing flooding under other running conditions.

1 Claim, 1 Drawing Figure



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CARBURETOR CONSTRUCTION TO ELIMINATE FUEL ACCUMULATION AT THE REED VALVE

This invention relates to a Carburetor Construction to Eliminate Fuel Accumulation at the Reed Valve and is particularly directed to the use of a carburetor system with a two-cycle engine in which a unidirectional valve is provided at the entrance to the crankcase of an engine to receive a fuel and air mixture from the carburetor system of the engine.

In two-cycle engines, many efforts have been made to improve carburetion to prevent choking of the engine when the throttle is suddenly cut from full throttle to the idle range and also to prevent flooding when there is a sudden change from the idle range to half or full throttle. Many of the problems have resulted from what is called "puddling" which means a collection of liquid fuel in certain areas of the engine. A change of position or a change in the running condition may cause the collected fuel suddenly to enter the engine and cause flooding conditions.

The present invention has as its object the elimination of these undesirable conditions of puddling and the provision of an extremely simple revised structure which makes this possible. Many attempts have been made to solve this problem by complicated carburetion efforts and the present system eliminates all of these requirements by a simple change in the standard structures utilized in these engines.

Other objects and features of the invention will be apparent in the following description and claims wherein the principles of operation of the invention are set forth together with the best mode presently contemplated for embodiment of such principles.

A drawing accompanies the disclosure and the single view therein shows a cross-section of a carburetor engine combination illustrating the invention.

In the drawing, a carburetor structure is generally illustrated at **10** having a mixing passage **12** with a throttle valve **14** and a choke valve **16**. A diaphragm **18** controls a fuel inlet valve **20** of standard construction and fuel enters the mixing passage **12** through a main jet **22**. The idle passages of the system include a passage **24** leading to a chamber **26** which has an idle port **28** at the throttle valve area of the mixing passage.

The carburetor is attached to a two-cycle engine crankcase **40** wherein a piston **42** operates in a cylinder **44** with the usual piston rod **46** and crankshaft **48**. Interposed between the outlet end **50** of the mixing passage **12** and the inlet end **52** of the engine is a mounting flange **54** of a reed valve construction which is insulated from the metal housings by heat barriers **56** and **58**. This is again standard construction. The reed valve has a tapered valve cage **60** with openings **62** which are closed by the flexible plates **64** commonly used in these reed valves. These plates are secured to the larger end of the tapered section by screws **66**.

The invention lies in placing openings **70** in the flange **54** leading from the outlet of the mixing passage **12** to the pockets or corners **72** at the base of the reed valve in the entrance to the passage **74** and the inlet end **52**. Thus, there is a venting of the so-called pockets or dead spaces surrounding the reed valve and this eliminates the so-called puddling of liquid fuel which can happen during the idling stage of the engine. Sometimes the puddling will occur during the idling stage and then, when the attitude of the engine is changed, the globs of fuel will be carried into the engine and cause an overrich condition which may result in the engine stalling. Other times, during the open throttle condition, this puddling will occur and a quick shut down to idle may cause a choking of the engine with an overrich mixture.

Under other circumstances, during idle running conditions, the puddles will accumulate in these pockets and when the engine changes position, as in the case of chain saws, for example, which are shifted to many positions, the accumulated fuel will dump into the engine and kill it.

It has been found that the openings **70** provided as indicated above will solve this problem. The size of the openings will be dependent on the size of the engine and can be readily calibrated by persons knowledgeable in the art for different size engines. For example, for an engine with a 3½-cubic inch capacity two-cycle, two holes having a dimension 0.052 inch were found to be sufficient. It is desirable that the holes be as small as possible to sweep the area clean since the larger the holes, the more possibility there is of a loss of power. Any reasonable sized hole will improve the conditions but a careful calibration will result in optimum operating efficiency. If a particular engine is intended to be used in a certain position, the holes can be introduced into the sides wherein there is most likelihood of the fuel accumulation.

Another advantage of the invention has been found in that an engine with the present invention incorporated therein can idle with a larger throttle opening so that tolerances between the throttle valve and the mixing passage can be reduced and thus the overall expense of manufacture is less. Thus, it can be said that the invention eliminates the idle puddling; it eliminates full throttle puddling; it provides a better comedown, that is, changing of speed from high open throttle to idle without the danger of flooding; it allows greater tolerances in the throttle valve fit.

What is claimed as new is as follows:

1. In an engine and carburetor combination wherein fuel and air mixture is introduced through a unidirectional valve, that improvement which comprises a unidirectional valve interposed between the mixing passage of the carburetor and the fuel passage of a crankcase housing of the engine, and means providing a plurality of fuel-air passages uncontrolled by said valve leading from the mixing passage of the carburetor to space in said fuel passage of the crankcase housing surrounding and outside said valve to sweep any accumulated liquid fuel into the crankcase housing.

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