

Title (en)  
FUEL INJECTION SYSTEM

Publication  
**EP 0050710 B1 19840411 (DE)**

Application  
**EP 81105545 A 19810715**

Priority  
DE 3039967 A 19801023

Abstract (en)  
[origin: US4388908A] To provide for extremely rapid operating conditions of the valve in an electrically controlled fuel injection system, that is, valve operation in the order of 10-5 seconds, for example, a pump (2, 62) provides pressurized fuel, and two, in push-pull operating valves (4, 64; 5, 65) are provided, in which one of the valves (4, 64) controls initiation of fuel injection, and the other one of the valves (5, 65) controls termination thereof; each one of the valves uses a spring-loaded valve element (18, 38", 38, 38'), operated by the pressure of the fuel to be injected, the valve elements being retained in a predetermined position by an electrically controlled operating unit (27, 47"; 47, 47') which has a positioning element operating in a positioning path having at least a component which is perpendicular to the operating direction of the valve element and which, as commanded by the control voltage applied thereto, clamps the valve element in a predetermined position, and thus prevents movement of the valve element even though fluid pressure is applied thereto. Preferably, the electrical control element is a stack of piezoelectric disks which, upon energization, expand in axial direction and press a clamping stem (26, 46"; 46, 46') the movable valve element (18, 38", 38, 38') in an operating bore of the valve unit or housing (16, 36).

IPC 1-7  
**F02M 47/02**; **F02M 51/00**

IPC 8 full level  
**F02M 51/00** (2006.01); **F02M 47/02** (2006.01); **F02M 59/36** (2006.01); **F02M 59/46** (2006.01); **F02B 1/04** (2006.01); **F02M 63/00** (2006.01)

CPC (source: EP US)  
**F02M 47/027** (2013.01 - EP US); **F02M 59/366** (2013.01 - EP US); **F02M 63/0026** (2013.01 - EP US); **F02B 1/04** (2013.01 - EP US)

Cited by  
EP0194431A1; FR2636675A1; FR2534318A1; WO0129401A1; EP0119894B1

Designated contracting state (EPC)  
DE FR GB

DOCDB simple family (publication)  
**EP 0050710 A1 19820505**; **EP 0050710 B1 19840411**; DE 3039967 A1 19820603; DE 3163073 D1 19840517; JP S5799266 A 19820619; US 4388908 A 19830621

DOCDB simple family (application)  
**EP 81105545 A 19810715**; DE 3039967 A 19801023; DE 3163073 T 19810715; JP 16730581 A 19811021; US 31167681 A 19811015