

Title (en)  
Fuel injection apparatus.

Title (de)  
Einspritzvorrichtung für Kraftstoff.

Title (fr)  
Dispositif d'injection de carburant.

Publication  
**EP 0246373 A1 19871125 (EN)**

Application  
**EP 86303903 A 19860522**

Priority  
EP 86303903 A 19860522

Abstract (en)  
Fuel is pumped and supplied to an injector (114, 208, 308, 408) which injects the fuel in the form of mist. The quantity of fuel injected from the nozzle is regulated by quantity control means. The control means is comprised of a control valve (152, 210, 310, 410), which is disposed on the injection hole (153, 238, 342, 426) of the injector for controlling the area of the injection hole. When the control valve has sufficient stroke to close the injection hole, the valve serves not only as a control valve, but also as a timing control valve. The movement or stroke of the control valve is accomplished by an actuator (126, 218, 338, 418) which is controlled by electrical control means, for example a microcomputer (122, 205, 305, 405), to enable a precise injection of fuel and an ideal combustion.

IPC 1-7  
**F02M 45/08; F02M 51/06; F02M 61/16; F02M 61/18; F02M 63/00**

IPC 8 full level  
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Citation (search report)

- [X] EP 0147026 A2 19850703 - MATSUMURA OSAMU
- [X] DE 3442022 A1 19850530 - TOYODA CHUO KENKYUSHO KK [JP]
- [X] DE 3411539 A1 19851010 - BOSCH GMBH ROBERT [DE]
- [X] US 4462368 A 19840731 - FUNADA TAKEO [JP]
- [X] US 3995813 A 19761207 - BART HANS U, et al
- [X] DE 1751543 A1 19700827 - KLOECKNER HUMBOLDT DEUTZ AG
- [X] DE 3030378 A1 19820225 - SIEMENS AG [DE]
- [Y] DE 2458940 A1 19750626 - SIGMA DIESEL
- [Y] GB 1465283 A 19770223 - HITACHI LTD
- [Y] GB 820568 A 19590923 - MAURICE MARIE JOSEPH DE MILLEV
- [Y] DE 3517611 A1 19851212 - STEYR DAIMLER PUCH AG [AT]
- [A] GB 2056559 A 19810318 - AUDI AG

Cited by  
US5494219A; US5494220A; EP1619385A1; US5720318A; US5474234A; US5605289A; EP0383065A1; EP2365206A1; CN102192063A; GB2282183A; US5518184A; GB2282183B; US5667145A; DE102007056988B4; DE102007056988A1; US5488340A; US5752308A; ITRE20120091A1; US5407131A; US5449119A; DE4034203A1; FR2668545A1; US5758626A; US5421521A; GB2285095A; GB2285095B; GB2319062A; GB2319062B; DE19637186A1; AT408132B; EP0719936A1

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