

Title (en)

Fuel injection device for internal combustion engines with needle lift damping

Title (de)

Kraftstoffeinspritzeinrichtung für Brennkraftmaschinen mit Nadelhubdämpfung

Title (fr)

Dispositif d'injection de combustible pour des moteurs à combustion interne avec amortissement de la levée de l'aiguille

Publication

**EP 1577538 B1 20070530 (DE)**

Application

**EP 05100197 A 20050114**

Priority

DE 102004010760 A 20040305

Abstract (en)

[origin: EP1577538A1] A damping chamber (50) for outer and inner damping pistons (41,43) is provided to an outer needle nozzle (11) to communicate with a closing chamber (29) via a hydraulic connection. The end face (37) of the outer needle nozzle is exposed to the closing chamber that communicates with a low-pressure return system (35) via a closing chamber throttle (31).

IPC 8 full level

**F02M 45/08** (2006.01); **F02M 47/02** (2006.01); **F02M 57/02** (2006.01); **F02M 61/20** (2006.01); **F02M 63/00** (2006.01)

CPC (source: EP US)

**F02M 45/086** (2013.01 - EP US); **F02M 47/027** (2013.01 - EP US); **F02M 57/025** (2013.01 - EP US); **F02M 57/026** (2013.01 - EP US); **F02M 61/205** (2013.01 - EP US); **F02M 2200/304** (2013.01 - EP US); **F02M 2200/46** (2013.01 - EP US)

Cited by

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Designated contracting state (EPC)

DE FR GB IT

DOCDB simple family (publication)

**EP 1577538 A1 20050921**; **EP 1577538 B1 20070530**; DE 102004010760 A1 20050922; DE 502005000757 D1 20070712; US 2005194468 A1 20050908; US 7066400 B2 20060627

DOCDB simple family (application)

**EP 05100197 A 20050114**; DE 102004010760 A 20040305; DE 502005000757 T 20050114; US 6895605 A 20050302