

SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING

F01 MACHINES OR ENGINES IN GENERAL; ENGINE PLANTS IN GENERAL; STEAM ENGINES

F01N GAS-FLOW SILENCERS OR EXHAUST APPARATUS FOR MACHINES OR ENGINES IN GENERAL; GAS-FLOW SILENCERS OR EXHAUST APPARATUS FOR INTERNAL-COMBUSTION ENGINES (arrangements in connection with gas exhaust of propulsion units in vehicles B60K 13/00; combustion-air intake silencers specially adapted for, or arranged on, internal-combustion engines F02M 35/00; protecting against, or damping, noise in general G10K 11/16)

Note(s)

Attention is drawn to the Notes preceding class F01, especially as regards Note (3).

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| 1/00 | Silencing apparatus characterised by method of silencing [1, 2006.01] | 3/029 | • • • • by adding non-fuel substances to exhaust [7, 2006.01] |
| 1/02 | • by using resonance [1, 2006.01] | 3/031 | • • • having means for by-passing filters, e.g. when clogged or during cold engine start [7, 2006.01] |
| 1/04 | • • having sound-absorbing materials in resonance chambers [1, 2006.01] | 3/032 | • • • • during filter regeneration only [7, 2006.01] |
| 1/06 | • by using interference effect [1, 2006.01] | 3/033 | • • • in combination with other devices [7, 2006.01] |
| 1/08 | • by reducing exhaust energy by throttling or whirling [1, 2006.01] | 3/035 | • • • • with catalytic reactors [7, 2006.01] |
| 1/10 | • • in combination with sound-absorbing materials [1, 2006.01] | 3/037 | • • by means of inertial or centrifugal separators, e.g. associated with agglomerators [7, 2006.01] |
| 1/12 | • • using spirally- or helically-shaped channels (F01N 1/10 takes precedence; cyclones B04C) [1, 2006.01] | 3/038 | • • by means of perforated plates defining expansion chambers associated with condensation and collection chambers [7, 2006.01] |
| 1/14 | • by adding air to exhaust gases [1, 2006.01] | 3/04 | • • by means of liquids [1, 2006.01] |
| 1/16 | • by using movable parts [1, 2006.01] | 3/05 | • • by means of air, e.g. by mixing exhaust with air (silencers working by addition of air to exhaust F01N 1/14; arrangements for the supply of additional air for the thermal or catalytic conversion of noxious components of exhaust F01N 3/30) [7, 2006.01] |
| 1/18 | • • having rotary movement [1, 2006.01] | 3/06 | • for extinguishing sparks [1, 2006.01] |
| 1/20 | • • having oscillating or vibrating movement (the parts being resilient walls F01N 1/22) [1, 2006.01] | 3/08 | • for rendering innocuous (using electric or electrostatic separators F01N 3/01; chemical aspects B01D 53/92) [1, 7, 2006.01] |
| 1/22 | • • the parts being resilient walls [1, 2006.01] | 3/10 | • • by thermal or catalytic conversion of noxious components of exhaust [1, 3, 2006.01] |
| 1/24 | • by using sound-absorbing materials (F01N 1/04, F01N 1/06, F01N 1/10, F01N 1/14, F01N 1/16 take precedence) [1, 2006.01] | 3/18 | • • • characterised by methods of operation; Regulation [3, 2006.01] |
| 3/00 | Exhaust or silencing apparatus having means for purifying, rendering innocuous, or otherwise treating exhaust (electric control F01N 9/00; monitoring or diagnostic devices for exhaust-gas treatment apparatus F01N 11/00) [1, 4, 2006.01] | 3/20 | • • • • specially adapted for catalytic conversion (F01N 3/22 takes precedence) [3, 2006.01] |
| 3/01 | • by means of electric or electrostatic separators [7, 2006.01] | 3/22 | • • • • Regulation of additional air supply only, e.g. using by-passes or variable air pump drives [3, 2006.01] |
| 3/02 | • for cooling, or for removing solid constituents of, exhaust (by means of electric or electrostatic separators F01N 3/01) [1, 7, 2006.01] | 3/24 | • • • characterised by constructional aspects of converting apparatus (filtering in combination with catalytic reactors F01N 3/035) [3, 7, 2006.01] |
| 3/021 | • • by means of filters [7, 2006.01] | 3/26 | • • • • Construction of thermal reactors [3, 2006.01] |
| 3/022 | • • • characterised by specially adapted filtering structure, e.g. honeycomb, mesh or fibrous [7, 2006.01] | 3/28 | • • • • Construction of catalytic reactors [3, 2006.01] |
| 3/023 | • • • using means for regenerating the filters, e.g. by burning trapped particles [7, 2006.01] | 3/30 | • • • • Arrangements for supply of additional air (regulation, e.g. using by-passes or variable air pump drives, F01N 3/22) [3, 2006.01] |
| 3/025 | • • • • using fuel burner or by adding fuel to exhaust [7, 2006.01] | | |
| 3/027 | • • • • using electric or magnetic heating [7, 2006.01] | | |
| 3/028 | • • • • • using microwaves [7, 2006.01] | | |

F01N

- 3/32 • • • • • using air pumps (using jet air pumps F01N 3/34; pumps in general F04) [3, 2006.01]
- 3/34 • • • • • using air conduits or jet air pumps, e.g. near the engine exhaust port [3, 2006.01]
- 3/36 • • • • • Arrangements for supply of additional fuel [3, 2006.01]
- 3/38 • • • • • Arrangements for igniting [3, 2006.01]
- 5/00 Exhaust or silencing apparatus combined or associated with devices profiting by exhaust energy** (using kinetic or wave energy of exhaust gases in exhaust systems for charging F02B; predominant aspects of such devices, see the relevant classes for the devices) [1, 2006.01]
 - 5/02 • the devices using heat [1, 2006.01]
 - 5/04 • the devices using kinetic energy [1, 2006.01]
- 9/00 Electrical control of exhaust gas treating apparatus** (monitoring or diagnostic devices for exhaust-gas treatment apparatus F01N 11/00; conjoint electrical control of two or more combustion engine functions F02D 43/00) [4, 2006.01]

- 11/00 Monitoring or diagnostic devices for exhaust-gas treatment apparatus** [7, 2006.01]
- 13/00 Exhaust or silencing apparatus characterised by constructional features** [2010.01]
 - 13/02 • having two or more separate silencers in series [2010.01]
 - 13/04 • having two or more silencers in parallel, e.g. having interconnections for multi-cylinder engines [2010.01]
 - 13/06 • specially adapted for star-arrangement of cylinders, e.g. exhaust manifolds [2010.01]
 - 13/08 • Other arrangements or adaptations of exhaust conduits [2010.01]
 - 13/10 • • of exhaust manifolds [2010.01]
 - 13/12 • specially adapted for submerged exhausting [2010.01]
 - 13/14 • having thermal insulation [2010.01]
 - 13/16 • Selection of particular materials [2010.01]
 - 13/18 • Construction facilitating manufacture, assembly or disassembly [2010.01]
 - 13/20 • having flared outlets, e.g. of fish-tail shape [2010.01]
- 99/00 Subject matter not provided for in other groups of this subclass** [2010.01]