

Title (en)

GASOLINE ADDITIVE COMPOSITION FOR IMPROVED ENGINE PERFORMANCE

Title (de)

BENZINZUSATZZUSAMMENSETZUNG FÜR VERBESSERTE MOTORLEISTUNG

Title (fr)

COMPOSITION D'ADDITIF POUR ESSENCE POUR AMÉLIORER LES PERFORMANCES D'UN MOTEUR

Publication

EP 4345150 A1 20240403 (EN)

Application

EP 23195748 A 20230906

Priority

- US 202217936987 A 20220930
- US 202318361286 A 20230728

Abstract (en)

The present disclosure provides fuel additives including quaternary ammonium salt additive(s) and Mannich detergent additive(s) effective to improve engine performance in both port fuel injected and gasoline direct injection engines.

IPC 8 full level

C10L 1/14 (2006.01); **C10L 1/198** (2006.01); **C10L 1/222** (2006.01); **C10L 1/224** (2006.01); **C10L 10/04** (2006.01); **C10L 10/06** (2006.01)

CPC (source: EP KR)

C10L 1/06 (2013.01 - KR); **C10L 1/14** (2013.01 - EP); **C10L 1/143** (2013.01 - KR); **C10L 1/146** (2013.01 - KR); **C10L 1/1641** (2013.01 - KR); **C10L 1/192** (2013.01 - KR); **C10L 1/1985** (2013.01 - KR); **C10L 10/04** (2013.01 - KR); **C10L 10/18** (2013.01 - KR); **C10L 1/1985** (2013.01 - EP); **C10L 1/221** (2013.01 - EP); **C10L 1/224** (2013.01 - EP); **C10L 1/238** (2013.01 - EP); **C10L 1/2383** (2013.01 - EP); **C10L 10/04** (2013.01 - EP); **C10L 10/06** (2013.01 - EP); **C10L 2200/0423** (2013.01 - EP); **C10L 2270/023** (2013.01 - EP)

Citation (applicant)

- US 4152499 A 19790501 - BOERZEL PAUL [DE], et al
- US 4605808 A 19860812 - SAMSON JOHN N R [GB]
- US 4231759 A 19801104 - UDELHOFEN JOHN H, et al
- US 5514190 A 19960507 - CUNNINGHAM LAWRENCE J [US], et al
- US 5634951 A 19970603 - COLUCCI WILLIAM J [US], et al
- US 5697988 A 19971216 - MALFER DENNIS J [US], et al
- US 5725612 A 19980310 - MALFER DENNIS J [US], et al
- US 5876468 A 19990302 - MORETON DAVID JOHN [GB]
- US 4234435 A 19801118 - MEINHARDT NORMAN A, et al
- US 4482357 A 19841113 - HANLON J VINCENT [US]
- US 5575823 A 19961119 - WALLACE GRAEME M [GB], et al
- US 3015668 A 19620102 - JOHN KOZIKOWSKI
- US 201213450638 A 20120419
- US 201113240233 A 20110922
- US 201213454697 A 20120424
- US 5266223 A 19931130 - SONG WON R [US], et al
- US 8894726 B2 20141125 - FANG XINGGAO [US], et al
- US 6800103 B2 20041005 - MALFER DENNIS J [US], et al
- SMITH, S.IMOEHL, W.: "Measurement and Control of Fuel Injector Deposits in Direct Injection Gasoline Vehicles", SAE TECHNICAL PAPER, 26 January 2013 (2013-01-26)
- SHANAHAN, C.SMITH, S.SEARS, B.: "A General Method for Fouling Injectors in Gasoline Direct Injection Vehicles and the Effects of Deposits on Vehicle Performance", SAE INT. J. FUELS LUBR, vol. 10, no. 3, 2017
- W. W. YAUJ. J. KIRKLANDD. D. BLY: "Modern Size Exclusion Liquid Chromatography", 1979, JOHN WILEY AND SONS

Citation (search report)

- [XI] US 2014196678 A1 20140717 - FANG XINGGAO [US], et al
- [X] US 2020024536 A1 20200123 - SHANAHAN CHARLES [US], et al
- [A] US 2009071065 A1 20090319 - MALFER DENNIS J [US], et al
- [A] US 2016289584 A1 20161006 - RUSSO JOSEPH M [US], et al
- [XD] US 8894726 B2 20141125 - FANG XINGGAO [US], et al

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA

Designated validation state (EPC)

KH MA MD TN

DOCDB simple family (publication)

EP 4345150 A1 20240403; CA 3211252 A1 20240330; EP 4345151 A1 20240403; KR 20240046009 A 20240408; KR 20240046010 A 20240408

DOCDB simple family (application)

EP 23195748 A 20230906; CA 3211252 A 20230906; EP 23195793 A 20230906; KR 20230118627 A 20230906; KR 20230118629 A 20230906