

In the Specification

Please amend paragraph [0001] on page 1 as follows:

This application is a continuation of United States Patent Application No. 13/410373 filed March 2, 2012 which is a continuation of United States Patent Application No. 13/282787 filed October 27, 2012 which is a continuation of 13/117,448 filed May 27, 2011 which is a continuation of 12/815,842 filed June 15, 2010 which is a continuation of United States Patent Application No. 12/329,729 filed on December 8, 2008 which is a continuation of United States Patent Application No. 11/840,719 filed on August 17, 2007, which is a continuation of United States Patent Application No. 10/991,774, which is now issued as United States Patent No. 7,314,033.

Listing of Claims

1 – 32 (cancelled)

33. (new) A spark ignition engine which is powered by ethanol and gasoline where liquid ethanol is introduced into at least one engine cylinder by direct injection in such a way that vaporization of the ethanol enhances the octane number of the fuel at a rate of at least 15 octane numbers for an increase of ethanol from 0 to 100 % of the fuel.

34. (new) The spark ignition engine of claim 33 where the ethanol is introduced so as to provide a greater concentration in the end-gas region of at least one engine cylinder.

35. (new) The spark ignition engine of claim 34 where the ethanol is introduced so as to provide a greater concentration in the periphery of at least one cylinder.

36. (new) The spark ignition engine of claim 33 where gasoline is directly injected.

37. (new) The spark ignition engine of claim 33 where the combination of the intrinsic octane number of ethanol and the octane number enhancement from the vaporization cooling provided by the ethanol enhance the octane number at a rate of at least 30 octane numbers for an increase in ethanol from 0 to 100 % of the fuel.

Application No.: Filed Herewith
Date: August 22, 2012

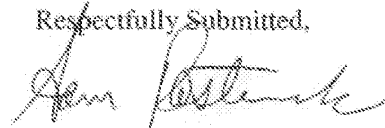
Docket No.: 11381.113158

Remarks

This preliminary amendment more particularly points out and distinctly claims the invention. No new matter is being introduced as these new claims are fully supported by the specification.

If there is a fee occasioned by this communication, the director hereby authorized to charge any deficiency or credit any overpayment in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 192553, under Docket No. 11381.113158.

Respectfully Submitted,



Sam (Bo) Pasternack
Registration Number: 29576
Massachusetts Institute of Technology
One Cambridge Center
Room NE18-501
Cambridge, MA 02142
617.258.7171

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES			
First Named Inventor/Applicant Name:	Daniel R. Cohn			
Filer:	Sam Pasternack/Abram Barrett			
Attorney Docket Number:	11381.113158			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	380	380
Utility Search Fee	1111	1	620	620
Utility Examination Fee	1311	1	250	250
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1250

Electronic Acknowledgement Receipt

EFS ID:	13561939
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	22-AUG-2012
Filing Date:	
Time Stamp:	15:27:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$1250
RAM confirmation Number	1962
Deposit Account	192553
Authorized User	SPIRIDIGLIOZZI,KAY
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees) Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	11381113158ADS.pdf	978722 e45321c5d08be460cb38bc73b95a5be545673a91	no	5
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
2	Specification	11381113158SPEC.pdf	567580 add5774c675e05d608b2291ddb79a731aa35b3d	no	15
Warnings:					
Information:					
3	Drawings-only black and white line drawings	11381113158FIGS.pdf	155751 71a5d998ba4cbcf97e541131a12b8669a9ba775d4	no	3
Warnings:					
Information:					
4	Oath or Declaration filed	11381113158DEC.pdf	120089 fa6c066fc652bd37078843f8a950563b77f91df	no	3
Warnings:					
Information:					
5	Preliminary Amendment	11381113158PREAMEND.pdf	365626 e36818c2261be83627d07cdfaff8a137fe06f66e	no	4
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	33088 0d8c54a106148c1d9b646875ce4f3c732a2db420	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			2220856		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	13561939
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	22-AUG-2012
Filing Date:	
Time Stamp:	15:27:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$1250
RAM confirmation Number	1962
Deposit Account	192553
Authorized User	SPIRIDIGLIOZZI,KAY
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees) Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	11381113158ADS.pdf	978722 e45321c5d08be460cb38bc73b95a5be545673a91	no	5
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
2	Specification	11381113158SPEC.pdf	567580 add5774c675e05d608b2291ddb79a731aa35b3d	no	15
Warnings:					
Information:					
3	Drawings-only black and white line drawings	11381113158FIGS.pdf	155751 71a5d998ba4cbc97e541131a12b8669a9ba775d4	no	3
Warnings:					
Information:					
4	Oath or Declaration filed	11381113158DEC.pdf	120089 fa6c066fc652bd37078843f8a950563b77f91df	no	3
Warnings:					
Information:					
5	Preliminary Amendment	11381113158PREAMEND.pdf	365626 e36818c2261be83627d07cdfaffba137fe06f66e	no	4
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	33088 0d8c54a106148c1d9b646875ce4f3c732a2db420	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			2220856		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	11381 113158
		Application Number	
Title of Invention	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2

Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1					
Applicant Authority		<input checked="" type="radio"/> Inventor		<input type="radio"/> Legal Representative under 35 U.S.C. 117	
				<input type="radio"/> Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Daniel	R.	Cohn		
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
City	Cambridge	State/Province	MA	Country of Residence	US
Citizenship under 37 CFR 1.41(b)		US			
Mailing Address of Applicant:					
Address 1		100 Memorial Drive			
Address 2		Apt 11-22 B			
City	Cambridge	State/Province	MA		
Postal Code	02142	Country	US		
Applicant 2					
Applicant Authority		<input checked="" type="radio"/> Inventor		<input type="radio"/> Legal Representative under 35 U.S.C. 117	
				<input type="radio"/> Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Leslie		Bromberg		
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
City	Sharon	State/Province	MA	Country of Residence	US
Citizenship under 37 CFR 1.41(b)		US			
Mailing Address of Applicant:					
Address 1		176 Wilshire Drive			
Address 2					
City	Sharon	State/Province	MA		
Postal Code	02067-1562	Country	US		
Applicant 3					
Applicant Authority		<input checked="" type="radio"/> Inventor		<input type="radio"/> Legal Representative under 35 U.S.C. 117	
				<input type="radio"/> Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	John	B.	Heywood		
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
City	Newtonville	State/Province	MA	Country of Residence	US

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	11381.113158	
		Application Number		
Title of Invention	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES			
Citizenship under 37 CFR 1.41(b)	US			
Mailing Address of Applicant:				
Address 1	218 Mill Street			
Address 2				
City	Newtonville	State/Province	MA	
Postal Code	02460-2444	Country	US	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add				

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.	
Customer Number	91197
Email Address	Add Email Remove Email

Application Information:

Title of the Invention	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES		
Attorney Docket Number	11381.113158	Small Entity Status Claimed	<input type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

Publication Information:

<input type="checkbox"/> Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/> Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative information during processing.			
Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	11381.113158
		Application Number	
Title of Invention	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES		
Customer Number	91197		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
	Continuation of	13/410373	2012-03-02		
Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	13/282787	2011-05-27	8069839	2011-12-06
Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	13/117448	2011-06-27	8069830	2011-12-06
Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	12/815842	2010-06-15	7971572	2011-07-05
Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	12/329729	2008-12-08	7762233	2010-07-27
Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	11/840719	2007-08-17	7740004	2010-06-22
Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	10/991774	2004-11-18	7314033	2008-01-01
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

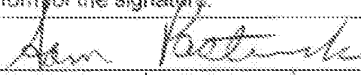
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	11381.113158
		Application Number	
Title of Invention	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES		
<input type="button" value="Remove"/>			
Application Number	Country ¹	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			<input checked="" type="radio"/> Yes <input type="radio"/> No
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.			
Assignee 1			
If the Assignee is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name	Massachusetts Institute of Technology		
Mailing Address Information:			
Address 1	77 Massachusetts Avenue		
Address 2			
City	Cambridge	State/Province	MA
Country ¹	US	Postal Code	02139
Phone Number		Fax Number	
Email Address			
Additional Assignee Data may be generated within this form by selecting the Add button.			

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.					
Signature			Date (YYYY-MM-DD)	2012-08-22	
First Name	Sam	Last Name	Pasternack	Registration Number	29576

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(f)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (25 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Fuel Management System for Variable Ethanol Octane Enhancement of Gasoline Engines

[0001] This application is a continuation of United States Patent Application No. 11/840,719 filed on August 17, 2007, which is a continuation of United States Patent Application No. 10/991,774, which is now issued as United States Patent No. 7,314,033.

BACKGROUND

[0002] This invention relates to spark ignition gasoline engines utilizing an antiknock agent which is a liquid fuel with a higher octane number than gasoline such as ethanol to improve engine efficiency.

[0003] It is known that the efficiency of spark ignition (SI) gasoline engines can be increased by high compression ratio operation and particularly by engine downsizing. The engine downsizing is made possible by the use of substantial pressure boosting from either turbocharging or supercharging. Such pressure boosting makes it possible to obtain the same performance in a significantly smaller engine. See, J. Stokes, *et al.*, "A Gasoline Engine Concept For Improved Fuel Economy The Lean-Boost System," SAE Paper 2001-01-2902. The use of these techniques to increase engine efficiency, however, is limited by the onset of engine knock. Knock is the undesired detonation of fuel and can severely damage an engine. If knock can be prevented, then high compression ratio operation and high pressure boosting can be used to increase engine efficiency by up to twenty-five percent.

[0004] Octane number represents the resistance of a fuel to knocking but the use of higher octane gasoline only modestly alleviates the tendency to knock. For example, the difference between regular and premium gasoline is typically six octane numbers. That is significantly less than is needed to realize fully the efficiency benefits of high compression ratio or turbocharged operation. There is thus a need for a practical means for achieving a much higher level of octane enhancement so that engines can be operated much more efficiently.

[0005] It is known to replace a portion of gasoline with small amounts of ethanol added at the refinery. Ethanol has a blending octane number (ON) of 110 (versus 95 for premium gasoline) (see J.B. Heywood, "Internal Combustion Engine Fundamentals," McGraw Hill, 1988, p. 477) and is also attractive because it is a renewable energy, biomass-derived fuel, but the small amounts of ethanol that have heretofore been added to gasoline have had a relatively small impact on engine performance. Ethanol is much more expensive than gasoline and the amount of ethanol that is readily available is much smaller than that of gasoline because of the relatively limited amount of biomass that is available for its production. An object of the present invention is to minimize the amount of ethanol or other antiknock agent that is used to achieve a given level of engine efficiency increase. By restricting the use of ethanol to the relatively small fraction of time in an operating cycle when it is needed to prevent knock in a higher load regime and by minimizing its use at these times, the amount of ethanol that is required can be limited to a relatively small fraction of the fuel used by the spark ignition gasoline engine.

SUMMARY

[0006] In one aspect, the invention is a fuel management system for efficient operation of a spark ignition gasoline engine including a source of an antiknock agent such as ethanol. An injector directly injects the ethanol into a cylinder of the engine and a fuel management system controls injection of the antiknock agent into the cylinder to control knock with minimum use of the antiknock agent. A preferred antiknock agent is ethanol. Ethanol has a high heat of vaporization so that there is substantial cooling of the air-fuel charge to the cylinder when it is injected directly into the engine. This cooling effect reduces the octane requirement of the engine by a considerable amount in addition to the improvement in knock resistance from the relatively high octane number of ethanol. Methanol, tertiary butyl alcohol, MTBE, ETBE, and TAME may also be used. Wherever ethanol is used herein it is to be understood that other antiknock agents are contemplated.

[0007] The fuel management system uses a fuel management control system that may use a microprocessor that operates in an open loop fashion on a predetermined correlation between octane number enhancement and fraction of fuel provided by the antiknock agent. To conserve the ethanol, it is preferred that it be added only during portions of a drive cycle requiring knock resistance and that its use be minimized during these times. Alternatively, the gasoline engine

may include a knock sensor that provides a feedback signal to a fuel management microprocessor system to minimize the amount of the ethanol added to prevent knock in a closed loop fashion.

[0008] In one embodiment the injectors stratify the ethanol to provide non-uniform deposition within a cylinder. For example, the ethanol may be injected proximate to the cylinder walls and swirl can create a ring of ethanol near the walls.

[0009] In another embodiment of this aspect of the invention, the system includes a measure of the amount of the antiknock agent such as ethanol in the source containing the antiknock agent to control turbocharging, supercharging or spark retard when the amount of ethanol is low.

[0010] The direct injection of ethanol provides substantially a 13°C drop in temperature for every ten percent of fuel energy provided by ethanol. An instantaneous octane enhancement of at least 4 octane numbers may be obtained for every 20 percent of the engine's energy coming from the ethanol.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a block diagram of one embodiment of the invention disclosed herein.

[0012] FIG. 2 is a graph of the drop in temperature within a cylinder as a function of the fraction of energy provided by ethanol.

[0013] FIG. 3 is a schematic illustration of the stratification of cooler ethanol charge using direct injection and swirl motion for achieving thermal stratification.

[0014] FIG. 4 is a schematic illustration showing ethanol stratified in an inlet manifold.

[0015] FIG. 5 is a block diagram of an embodiment of the invention in which the fuel management microprocessor is used to control a turbocharger and spark retard based upon the amount of ethanol in a fuel tank.

DETAILED DESCRIPTION

[0016] With reference first to FIG. 1, a spark ignition gasoline engine 10 includes a knock sensor 12 and a fuel management microprocessor system 14. The fuel management microprocessor system 14 controls the direct injection of an antiknock agent such as ethanol from an ethanol tank 16. The fuel management microprocessor system 14 also controls the delivery of gasoline from a gasoline tank 18 into engine manifold 20. A turbocharger 22 is

provided to improve the torque and power density of the engine 10. The amount of ethanol injection is dictated either by a predetermined correlation between octane number enhancement and fraction of fuel that is provided by ethanol in an open loop system or by a closed loop control system that uses a signal from the knock sensor 12 as an input to the fuel management microprocessor 14. In both situations, the fuel management processor 14 will minimize the amount of ethanol added to a cylinder while still preventing knock. It is also contemplated that the fuel management microprocessor system 14 could provide a combination of open and closed loop control.

[0017] As show in FIG. 1 it is preferred that ethanol be directly injected into the engine 10. Direct injection substantially increases the benefits of ethanol addition and decreases the required amount of ethanol. Recent advances in fuel injector and electronic control technology allows fuel injection directly into a spark ignition engine rather than into the manifold 20. Because ethanol has a high heat of vaporization there will be substantial cooling when it is directly injected into the engine 10. This cooling effect further increases knock resistance by a considerable amount. In the embodiment of FIG. 1 port fuel injection of the gasoline in which the gasoline is injected into the manifold rather than directly injected into the cylinder is preferred because it is advantageous in obtaining good air/fuel mixing and combustion stability that are difficult to obtain with direct injection.

[0018] Ethanol has a heat of vaporization of 840kJ/kg, while the heat of vaporization of gasoline is about 350kJ/kg. The attractiveness of ethanol increases when compared with gasoline on an energy basis, since the lower heating value of ethanol is 26.9MJ/kg while for gasoline it is about 44MJ/kg. Thus, the heat of vaporization per Joule of combustion energy is 0.031 for ethanol and 0.008 for gasoline. That is, for equal amounts of energy the required heat of vaporization of ethanol is about four times higher than that of gasoline. The ratio of the heat of vaporization per unit air required for stoichiometric combustion is about 94 kJ/kg of air for ethanol and 24 kJ/kg of air for gasoline, or a factor of four smaller. Thus, the net effect of cooling the air charge is about four times lower for gasoline than for ethanol (for stoichiometric mixtures wherein the amount of air contains oxygen that is just sufficient to combust all of the fuel).

[0019] In the case of ethanol direct injection according to one aspect of the invention, the charge is directly cooled. The amount of cooling due to direct injection of ethanol is shown in FIG. 2. It is assumed that the air/fuel mixture is stoichiometric without exhaust gas recirculation (EGR), and that gasoline makes up the rest of the fuel. It is further assumed that only the ethanol contributes to charge cooling. Gasoline is vaporized in the inlet manifold and does not contribute to cylinder charge cooling. The direct ethanol injection provides about 13°C of cooling for each 10% of the fuel energy provided by ethanol. It is also possible to use direct injection of gasoline as well as direct injection of ethanol. However, under certain conditions there can be combustion stability issues.

[0020] The temperature decrement because of the vaporization energy of the ethanol decreases with lean operation and with EGR, as the thermal capacity of the cylinder charge increases. If the engine operates at twice the stoichiometric air/fuel ratio, the numbers indicated in FIG. 2 decrease by about a factor of 2 (the contribution of the ethanol itself and the gasoline is relatively modest). Similarly, for a 20% EGR rate, the cooling effect of the ethanol decreases by about 25%.

[0021] The octane enhancement effect can be estimated from the data in FIG. 2. Direct injection of gasoline results in approximately a five octane number decrease in the octane number required by the engine, as discussed by Stokes, *et al.* Thus the contribution is about five octane numbers per 30K drop in charge temperature. As ethanol can decrease the charge temperature by about 120K, then the decrease in octane number required by the engine due to the drop in temperature, for 100% ethanol, is twenty octane numbers. Thus, when 100% of the fuel is provided by ethanol, the octane number enhancement is approximately thirty-five octane numbers with a twenty octane number enhancement coming from direct injection cooling and a fifteen octane number enhancement coming from the octane number of ethanol. From the above considerations, it can be projected that even if the octane enhancement from direct cooling is significantly lower, a total octane number enhancement of at least 4 octane numbers should be achievable for every 20% of the total fuel energy that is provided by ethanol.

[0022] Alternatively the ethanol and gasoline can be mixed together and then port injected through a single injector per cylinder, thereby decreasing the number of injectors that would be used. However, the air charge cooling benefit from ethanol would be lost.

[0023] Alternatively the ethanol and gasoline can be mixed together and then port fuel injected using a single injector per cylinder, thereby decreasing the number of injectors that would be used. However, the substantial air charge cooling benefit from ethanol would be lost. The volume of fuel between the mixing point and the port fuel injector should be minimized in order to meet the demanding dynamic octane-enhancement requirements of the engine.

[0024] Relatively precise determinations of the actual amount of octane enhancement from given amounts of direct ethanol injection can be obtained from laboratory and vehicle tests in addition to detailed calculations. These correlations can be used by the fuel management microprocessor system 14.

[0025] An additional benefit of using ethanol for octane enhancement is the ability to use it in a mixture with water. Such a mixture can eliminate the need for the costly and energy consuming water removal step in producing pure ethanol that must be employed when ethanol is added to gasoline at a refinery. Moreover, the water provides an additional cooling (due to vaporization) that further increases engine knock resistance. In contrast the present use of ethanol as an additive to gasoline at the refinery requires that the water be removed from the ethanol.

[0026] Since unlike gasoline, ethanol is not a good lubricant and the ethanol fuel injector can stick and not open, it is desirable to add a lubricant to the ethanol. The lubricant will also denature the ethanol and make it unattractive for human consumption.

[0027] Further decreases in the required ethanol for a given amount of octane enhancement can be achieved with stratification (non-uniform deposition) of the ethanol addition. Direct injection can be used to place the ethanol near the walls of the cylinder where the need for knock reduction is greatest. The direct injection may be used in combination with swirl. This stratification of the ethanol in the engine further reduces the amount of ethanol needed to obtain a given amount of octane enhancement. Because only the ethanol is directly injected and because it is stratified both by the injection process and by thermal centrifugation, the ignition stability issues associated with gasoline direct injection (GDI) can be avoided.

[0028] It is preferred that ethanol be added to those regions that make up the end-gas and are prone to auto-ignition. These regions are near the walls of the cylinder. Since the end-gas

contains on the order of 25% of the fuel, substantial decrements in the required amounts of ethanol can be achieved by stratifying the ethanol.

[0029] In the case of the engine 10 having substantial organized motion (such as swirl), the cooling will result in forces that thermally stratify the discharge (centrifugal separation of the regions at different density due to different temperatures). The effect of ethanol addition is to increase gas density since the temperature is decreased. With swirl the ethanol mixture will automatically move to the zone where the end-gas is, and thus increase the anti-knock effectiveness of the injected ethanol. The swirl motion is not affected much by the compression stroke and thus survives better than tumble-like motion that drives turbulence towards top-dead-center (TDC) and then dissipates. It should be pointed out that relatively modest swirls result in large separating (centrifugal) forces. A 3m/s swirl motion in a 5cm radius cylinder generates accelerations of about 200m/s^2 , or about 20g's.

[0030] FIG. 3 illustrates ethanol direct injection and swirl motion for achieving thermal stratification. Ethanol is predominantly on an outside region which is the end-gas region. FIG. 4 illustrates a possible stratification of the ethanol in an inlet manifold with swirl motion and thermal centrifugation maintaining stratification in the cylinder. In this case of port injection of ethanol, however, the advantage of substantial charge cooling may be lost.

[0031] With reference again to FIG. 2, the effect of ethanol addition all the way up to 100% ethanol injection is shown. At the point that the engine is 100% direct ethanol injected, there may be issues of engine stability when operating with only stratified ethanol injection that need to be addressed. In the case of stratified operation it may also be advantageous to stratify the injection of gasoline in order to provide a relatively uniform equivalence ratio across the cylinder (and therefore lower concentrations of gasoline in the regions where the ethanol is injected). This situation can be achieved, as indicated in FIG. 4, by placing fuel in the region of the inlet manifold that is void of ethanol.

[0032] The ethanol used in the invention can either be contained in a separate tank from the gasoline or may be separated from a gasoline/ethanol mixture stored in one tank.

[0033] The instantaneous ethanol injection requirement and total ethanol consumption over a drive cycle can be estimated from information about the drive cycle and the increase in torque (and thus increase in compression ratio, engine power density, and capability for downsizing)

that is desired. A plot of the amount of operating time spent at various values of torque and engine speed in FTP and US06 drive cycles can be used. It is necessary to enhance the octane number at each point in the drive cycle where the torque is greater than permitted for knock free operation with gasoline alone. The amount of octane enhancement that is required is determined by the torque level.

[0034] A rough illustrative calculation shows that only a small amount of ethanol might be needed over the drive cycle. Assume that it is desired to increase the maximum torque level by a factor of two relative to what is possible without direct injection ethanol octane enhancement. Information about the operating time for the combined FTP and US06 cycles shows that approximately only 10 percent of the time is spent at torque levels above 0.5 maximum torque and less than 1 percent of the time is spent above 0.9 maximum torque. Conservatively assuming that 100 % ethanol addition is needed at maximum torque and that the energy fraction of ethanol addition that is required to prevent knock decreases linearly to zero at 50 percent of maximum torque, the energy fraction provided by ethanol is about 30 percent. During a drive cycle about 20 percent of the total fuel energy is consumed at greater than 50 percent of maximum torque since during the 10 percent of the time that the engine is operated in this regime, the amount of fuel consumed is about twice that which is consumed below 50 percent of maximum torque. The amount of ethanol energy consumed during the drive cycle is thus roughly around 6 percent (30 percent x 0.2) of the total fuel energy.

[0035] In this case then, although 100% ethanol addition was needed at the highest value of torque, only 6% addition was needed averaged over the drive cycle. The ethanol is much more effectively used by varying the level of addition according to the needs of the drive cycle.

[0036] Because of the lower heat of combustion of ethanol, the required amount of ethanol would be about 9% of the weight of the gasoline fuel or about 9% of the volume (since the densities of ethanol and gasoline are comparable). A separate tank with a capacity of about 1.8 gallons would then be required in automobiles with twenty gallon gasoline tanks. The stored ethanol content would be about 9% of that of gasoline by weight, a number not too different from present-day reformulated gasoline. Stratification of the ethanol addition could reduce this amount by more than a factor of two. An on-line ethanol distillation system might alternatively

be employed but would entail elimination or reduction of the increase torque and power available from turbocharging.

[0037] Because of the relatively small amount of ethanol and present lack of an ethanol fueling infrastructure, it is important that the ethanol vehicle be operable if there is no ethanol on the vehicle. The engine system can be designed such that although the torque and power benefits would be lower when ethanol is not available, the vehicle could still be operable by reducing or eliminating turbocharging capability and/or by increasing spark retard so as to avoid knock. As shown in FIG. 5, the fuel management microprocessor system 14 uses ethanol fuel level in the ethanol tank 16 as an input to control the turbocharger 22 (or supercharger or spark retard, not shown). As an example, with on-demand ethanol octane enhancement, a 4-cylinder engine can produce in the range of 280 horsepower with appropriate turbocharging or supercharging but could also be drivable with an engine power of 140 horsepower without the use of ethanol according to the invention.

[0038] The impact of a small amount of ethanol upon fuel efficiency through use in a higher efficiency engine can greatly increase the energy value of the ethanol. For example, gasoline consumption could be reduced by 20% due to higher efficiency engine operation from use of a high compression ratio, strongly turbocharged operation and substantial engine downsizing. The energy value of the ethanol, including its value in direct replacement of gasoline (5% of the energy of the gasoline), is thus roughly equal to 25% of the gasoline that would have been used in a less efficient engine without any ethanol. The 5% gasoline equivalent energy value of ethanol has thus been leveraged up to a 25% gasoline equivalent value. Thus, ethanol can cost roughly up to five times that of gasoline on an energy basis and still be economically attractive. The use of ethanol as disclosed herein can be a much greater value use than in other ethanol applications.

[0039] Although the above discussion has featured ethanol as an exemplary anti-knock agent, the same approach can be applied to other high octane fuel and fuel additives with high vaporization energies such as methanol (with higher vaporization energy per unit fuel), and other anti-knock agents such as tertiary butyl alcohol, or others such as methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), or tertiary amyl methyl ether (TAME).

[0040] It is recognized that modifications and variations of the invention disclosed herein will be apparent to those of ordinary skill in the art and it is intended that all such modifications and variations be included within the scope of the appended claims.

CLAIMS

What is claimed is:

1. A spark ignition engine system for which fuel is introduced into the engine from a first source and a liquid is separately introduced into the engine from a second source by direct injection comprising:
 - a spark ignition engine;
 - a first means for introducing the fuel from the first source into the engine;
 - a second means for direct injection of the liquid from the second source into the engine, wherein during part of the engine operating time, the engine receives both the fuel from the first source and the liquid that is directly injected from the second source; and
 - a fuel management system which varies the relative amount of the liquid from the second source that is introduced into the engine so as to prevent knock, wherein the fuel management system employs information from a knock detector and uses closed loop control to control the amount of directly injected liquid from the second source; and
 - wherein the engine is operated with a substantially stoichiometric fuel/air ratio.
2. The engine system of claim 1, wherein the engine is turbocharged or supercharged.
3. The engine system of claim 1 or 2, wherein the liquid from the second source is alcohol.
4. The engine system of claim 3, wherein the alcohol is methanol.
5. The engine system of claim 3, wherein the alcohol is ethanol.
6. The engine system of claim 1 or 2, wherein the liquid from the second source is an alcohol-water mixture.
7. The engine system of claim 1 or 2, wherein the liquid from the second source includes water.
8. The engine system of claim 1 or 2, wherein the fuel from the first source is gasoline and the liquid from the second source includes water.

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9. The engine system of claim 1 or 2, wherein the liquid from the second source is injected so as to result in a non-uniform distribution in the engine cylinder.
10. The engine system of claim 9, wherein the liquid from the second source is injected so as to be more concentrated near the periphery of the engine cylinder, and
wherein the liquid from the second source includes alcohol, and
wherein the alcohol energy fraction is sufficiently high to prevent knock but the alcohol energy fraction is reduced as compared to the situation using a uniform distribution.
11. The engine system of claim 1 or 2, wherein the fuel management system employs a microprocessor for control of the relative amount of liquid from the second source that is directly injected into the engine using information from a knock sensor, and
wherein the relative amount of the liquid from the second source increases with increasing torque, and
wherein the fuel management system minimizes the amount of directly injected liquid from the second source that is used over a drive cycle.
12. The engine system of claim 11 further including open loop control with a look up table.
13. The engine system of claims 1 or 2, wherein spark retard is used and is varied according to the consumption of the liquid from the second tank.
14. A spark ignition engine system into which fuel is introduced into the engine from a first source using a first fuel injector and a liquid from a second source is introduced into the engine using a second fuel injector comprising:
a spark ignition engine;
a first fuel injector for introducing fuel into the engine from the first source;
a second fuel injector for introducing the liquid from the second source into the engine
wherein during part of the engine operating time, the engine receives both the fuel from the first source and the liquid from the second source; and
a fuel management system which varies the relative amount of the liquid from the second source that is introduced into the engine so as to prevent knock, wherein the fuel management

system uses closed loop control to control the amount of liquid from the second source and employs information from a knock detector, and
wherein the engine is operated with a substantially stoichiometric fuel/air ratio.

15. The engine system of claim 14, wherein the fuel from the first source is port fuel injected.
16. The engine system of claim 14 or 15, wherein the liquid from the second source is alcohol.
17. The engine system of claim 16, wherein the alcohol is methanol.
18. The engine system of claim 16, wherein the alcohol is ethanol.
19. The engine system of claims 14 or 15, wherein the liquid from the second source is an alcohol-water mixture.
20. The engine system of claims 14 or 15, wherein the liquid from the second source includes water.
21. The engine system of claims 14 or 15, wherein the fuel from the first source is gasoline and the liquid from the second source includes water.
22. The engine system of claims 14 or 15, wherein the fuel management system employs a microprocessor for control of the relative amount of liquid from the second source that is directly injected into the engine using information from a knock sensor, and wherein
the relative amount of liquid from the second source increases with increasing torque, and
wherein the fuel management system minimizes the amount of directly injected liquid from the second source that is used over a drive cycle.
23. The engine system of claim 22 further including open loop control with a look up table.
24. The engine system of claims 14 or 15, wherein spark retard is used and is varied according to the consumption of the liquid from the second tank.
25. The engine system of claims 14 or 15, wherein the engine is turbocharged.

26. The engine system of claims 14 or 15, wherein the engine is supercharged.
27. A turbocharged or supercharged spark ignition engine system which uses both port fuel injection of gasoline from a first source and direct fuel injection of alcohol from a second source comprising:
- a spark ignition engine;
 - a turbocharger or supercharger;
 - means for port fuel injection of gasoline from the first source;
 - means for direct fuel injection of alcohol from the second source, wherein during part of the engine operating time, the engine is fueled both by gasoline that is port fuel injected and alcohol that is directly injected; and
 - a fuel management system which increases the relative amount of alcohol in the engine with increasing torque so as to prevent knock, wherein the fuel management system employs information from a knock detector and uses closed loop control to control the amount of directly injected alcohol, and
 - wherein the engine is operated with a substantially stoichiometric fuel/air ratio.
28. The engine system of claim 27, wherein the alcohol is methanol.
29. The engine system of claim 27, wherein the alcohol is ethanol.
30. The engine system of claim 27, wherein the alcohol is mixed with water.
31. The engine system of claim 27, wherein the fuel management system employs a microprocessor for control of the relative amount of alcohol from the second source that is directly injected into the engine using information from a knock sensor.
32. The engine system of claim 31, wherein the fuel management system minimizes the amount of directly injected alcohol from the second source that is used over a drive cycle.

ABSTRACT

Fuel management system for efficient operation of a spark ignition gasoline engine. Injectors inject an anti-knock agent such as ethanol directly into a cylinder of the engine. A fuel management microprocessor system controls injection of the anti-knock agent so as to control knock and minimize that amount of the anti-knock agent that is used in a drive cycle. It is preferred that the anti-knock agent is ethanol. The use of ethanol can be further minimized by injection in a non-uniform manner within a cylinder. The ethanol injection suppresses knock so that higher compression ratio and/or engine downsizing from increased turbocharging or supercharging can be used to increase the efficiency of the engine.

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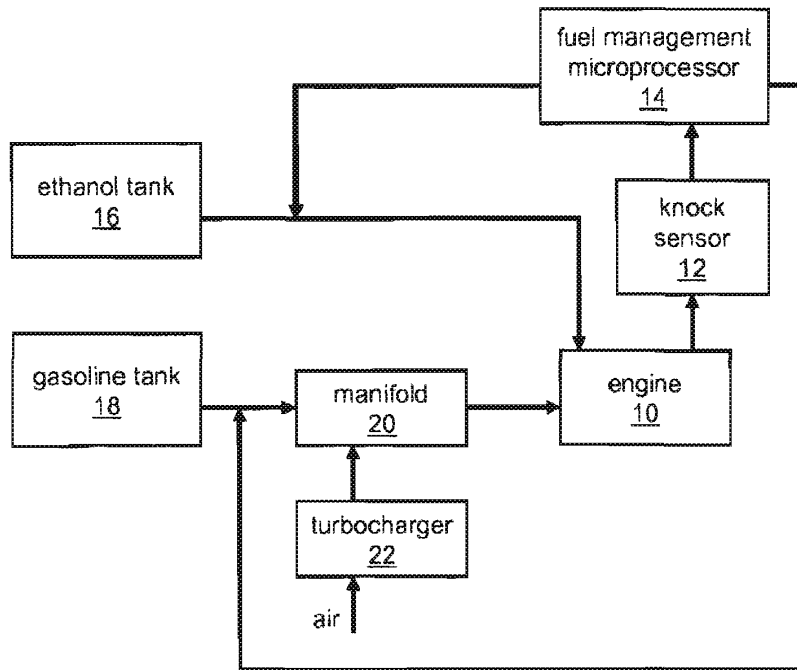


FIG. 1

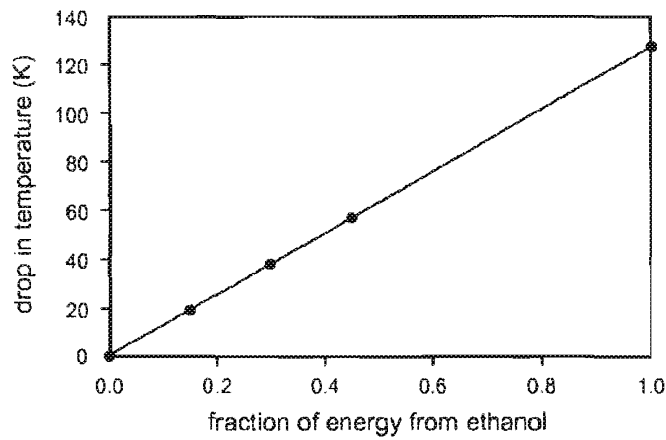


FIG. 2

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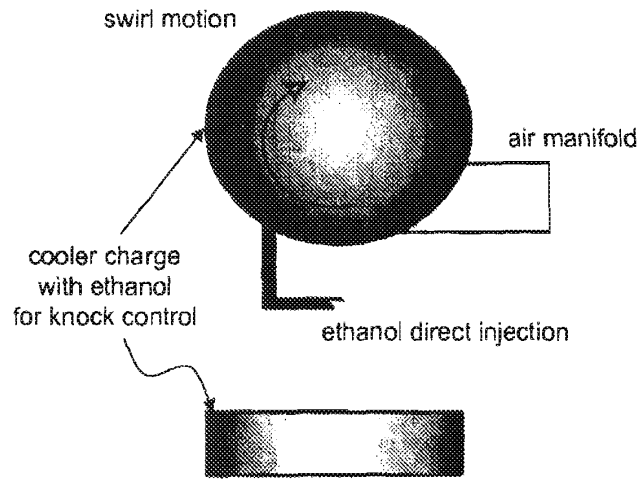


FIG. 3

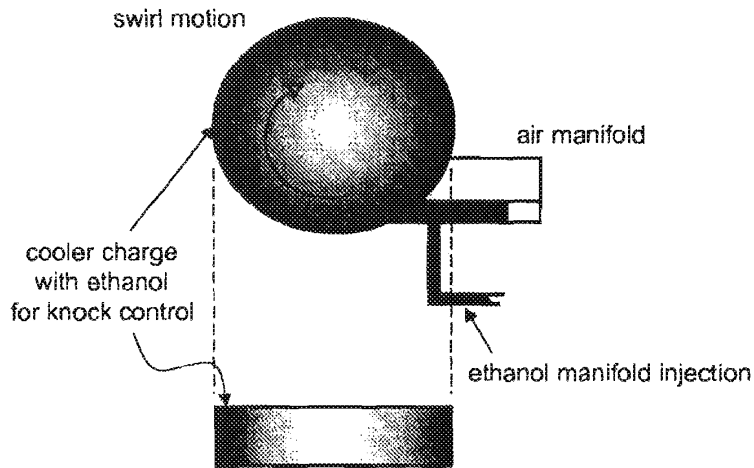


FIG. 4

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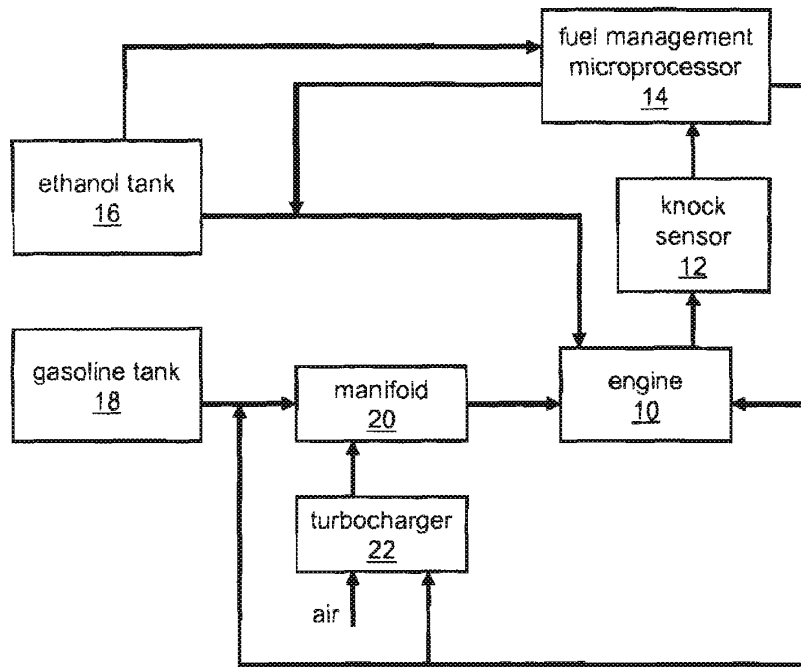


FIG. 5

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DECLARATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

the specification of which (I authorize Choate, Hall & Stewart to check one of the following three choices, and fill in the blanks, if applicable):

_____ is attached hereto

X was filed on November 18, 2004 as Application Serial No. 10/991,774 and amended on _____ (if applicable).

_____ was filed as PCT international application No. _____ on _____ and was amended under PCT Article 19 on _____ (if applicable).

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledged the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):		Priority Claimed	
(Number)	(Country)	(Day/Month/Year/Filed)	Yes No
_____	_____	_____	Yes No
(Number)	(Country)	(Day/Month/Year/Filed)	Yes No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

_____ (Application Serial No.)	_____ (filing date)	_____ (status-patented, pending, abandoned)
_____ (Application Serial No.)	_____ (filing date)	_____ (status-patented, pending, abandoned)

PCT Applications designating the United States:

_____ (PCT Appl. No.)	_____ (U.S.S.N.)	_____ (status-patented, pending, abandoned)
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I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national filing date of this application.

Provisional Application(s):

_____ (Application Serial No.)	_____ (filing date)	_____ (status)
_____ (Application Serial No.)	_____ (filing date)	_____ (status)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United State Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Full name of first inventor Daniel R. Cohn
Inventor's signature Daniel R. Cohn Date: 2/7/05
Residence 26 Walnut St Chestnut Hill MA 02467
Citizenship _____
Post Office Address Technology Licensing Office, Massachusetts Institute of Technology,
Five Cambridge Center, Kendall Square, Room NE25-230, Cambridge, MA 02142-1493

Full name of second inventor Leslie Bromberg
Inventor's signature Leslie Bromberg Date: 2/7/05
Residence 176 Wildhurst Dr Sharon MA 02067
Citizenship US
Post Office Address Technology Licensing Office, Massachusetts Institute of Technology,
Five Cambridge Center, Kendall Square, Room NE25-230, Cambridge, MA 02142-1493

Full name of third inventor John B. Heywood
Inventor's signature John B. Heywood Date: 2/7/05
Residence 218 Mill Street, Newton MA 02460
Citizenship USA
Post Office Address Technology Licensing Office, Massachusetts Institute of Technology,
Five Cambridge Center, Kendall Square, Room NE25-230, Cambridge, MA 02142-1493

SCORE Placeholder Sheet for IFW Content

Application Number: 13591717

Document Date: 8/22/2012

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Table with 7 columns: APPLICATION NUMBER, FILING or 371(c) DATE, GRP ART UNIT, FIL FEE REC'D, ATTY. DOCKET NO, TOT CLAIMS, IND CLAIMS. Values: 13/591,717, 08/22/2012, 1771, 1250, 11381.113158, 5, 1

CONFIRMATION NO. 8123

FILING RECEIPT



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One Cambridge Center
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Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections

Applicant(s)

Daniel R. Cohn, Cambridge, MA;
Leslie Bromberg, Sharon, MA;
John B. Heywood, Newtonville, MA;

Assignment For Published Patent Application

Massachusetts Institute of Technology, Cambridge, MA

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/410,373 03/02/2012
and is a CON of 13/282,787 10/27/2011 PAT 8146568 *
and is a CON of 13/117,448 05/27/2011 PAT 8069839 *
and is a CON of 12/815,842 06/15/2010 PAT 7971572
and is a CON of 12/329,729 12/08/2008 PAT 7762233
and is a CON of 11/840,719 08/17/2007 PAT 7740004
and is a CON of 10/991,774 11/18/2004 PAT 7314033
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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US 13/591,717

Projected Publication Date: 12/13/2012

Non-Publication Request: No

Early Publication Request: No
Title

FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF
GASOLINE ENGINES

Preliminary Class

044

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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PATENT APPLICATION FEE DETERMINATION RECORD
Substitute for Form PTO-875

Application or Docket Number
13/591,717

APPLICATION AS FILED - PART I

(Column 1)		(Column 2)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	380
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	620
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	5	minus 20 = *			OR	x 60 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *			OR	x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1250

APPLICATION AS AMENDED - PART II

		(Column 1)	(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
 The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

Application No.: 13/591717
Date: October 4, 2012

Docket No.: 11381.113158

ATTORNEY DOCKET NO.: 11381.113158

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Daniel R Cohn et al. Examiner: Huynh, Hai H
Serial No.: 13/591717 Art Unit: 3747
Filing Date: August 22, 2012 Confirmation No.: 8123
Title: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE
ENHANCEMENT OF GASOLINE ENGINES

PRELIMINARY AMENDMENT

Via EFS-Web
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INTRODUCTORY COMMENTS

Before examination on the merits, please amend the application as follows.

Listing of Claims

Claims 1 - 37 (cancelled)

38. (new) A spark ignition engine which is fueled with gasoline and ethanol where fuel is introduced into the engine in such a way that liquid ethanol vaporizes in at least one engine cylinder and vaporization cooling from the ethanol enhances the octane number at a rate of at least 15 octane numbers for an increase from 0 to 100 % in the ethanol fraction of fuel in the cylinder.

39. (new) The spark ignition engine of claim 38 where ethanol is introduced into at least one engine cylinder by direct injection.

40. (new) A spark ignition engine which is fueled with gasoline and ethanol and where the fuel is introduced into at least one cylinder in such a way that the octane number is enhanced by use of ethanol at a rate of at least 30 octane numbers for a an increase from 0 to 100% in the ethanol fraction of fuel in the cylinder.

41. (new) The spark ignition engine of claim 40 where ethanol vaporizes inside at least one engine cylinder and the octane enhancement from vaporization cooling increases with ethanol use at a rate of at a rate of least 15 octane numbers for an increase from 0 to 100 % in the ethanol faction of fuel in the cylinder.

42. (new) The spark ignition engine of claims 40 or 41 where ethanol is introduced into the cylinder by direct injection

43. (new) A spark ignition engine where a first fuel is introduced into the engine by a first fuel injector which is a port fuel injector and a second fuel is introduced into the engine by a second fuel injector
where the second fuel has a higher octane number than the first fuel and where the second fuel is introduced into at least one cylinder by a direct fuel injector

44. (new) The spark ignition engine of claim 43 where the ratio of the amount of fuel introduced into the engine by the second fuel injector to the amount of fuel introduced into the engine by the first fuel injector increases with increasing torque.

45. (new) The spark ignition engine of claim 43 where the fuel -air ratio is substantially stoichiometric.

Remarks

This preliminary amendment more particularly points out and distinctly claims the invention. No new matter is being introduced as these new claims are fully supported by the specification.

If there is a fee occasioned by this communication, the director is hereby authorized to charge any deficiency or credit any overpayment in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 192553, under Docket No. 11381.113158.

Respectfully Submitted,



Sam Pasternack
Registration No.: 29576
Massachusetts Institute of Technology
Five Cambridge Center
Room NE25-230
Cambridge, MA 02412-1493
617.258.7171

Electronic Acknowledgement Receipt

EFS ID:	13908203
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	04-OCT-2012
Filing Date:	22-AUG-2012
Time Stamp:	14:54:44
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Preliminary Amendment	11381113158PreAmend.pdf	354610 b72deee19701be3c39308e91427586f489e4ee8d	no	4

Warnings:

Information:

Total Files Size (in bytes):

354610

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 13/591,717		Filing Date 08/22/2012		<input type="checkbox"/> To be Mailed			
APPLICATION AS FILED – PART I					OTHER THAN							
(Column 1)			(Column 2)		SMALL ENTITY <input type="checkbox"/>		OR			SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)					
<input type="checkbox"/> BASIC FEE <small>(37 CFR 1.16(a), (b), or (c))</small>	N/A	N/A	N/A			N/A						
<input type="checkbox"/> SEARCH FEE <small>(37 CFR 1.16(k), (j), or (m))</small>	N/A	N/A	N/A			N/A						
<input type="checkbox"/> EXAMINATION FEE <small>(37 CFR 1.16(o), (p), or (q))</small>	N/A	N/A	N/A			N/A						
TOTAL CLAIMS <small>(37 CFR 1.16(i))</small>	minus 20 =	*	X \$ =			X \$ =						
INDEPENDENT CLAIMS <small>(37 CFR 1.16(h))</small>	minus 3 =	*	X \$ =			X \$ =						
<input type="checkbox"/> APPLICATION SIZE FEE <small>(37 CFR 1.16(s))</small>	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).											
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT <small>(37 CFR 1.16(j))</small>												
					TOTAL		TOTAL					
APPLICATION AS AMENDED – PART II					OTHER THAN							
(Column 1)			(Column 2)		SMALL ENTITY		OR			SMALL ENTITY		
AMENDMENT	10/04/2012	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 9	Minus	** 20	= 0	X \$ =			X \$60=	0		
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X \$ =			X \$250=	0		
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))											
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
					TOTAL ADD'L FEE		TOTAL ADD'L FEE	0				
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)				
	Total (37 CFR 1.16(i))	*	Minus	**	=		X \$ =		X \$ =			
	Independent (37 CFR 1.16(h))	*	Minus	***	=		X \$ =		X \$ =			
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))											
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
					TOTAL ADD'L FEE		TOTAL ADD'L FEE					
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.					Legal Instrument Examiner: /DAWN BREWER/							

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
 If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,717	08/22/2012	Daniel R. Cohn	11381.113158	8123

91197 7590 11/14/2012
MIT's Technology Licensing Office
One Cambridge Center
Kendall Square, NE 18-501
Cambridge, MA 02142-1493

EXAMINER

HUYNH, HAI H

ART UNIT	PAPER NUMBER
----------	--------------

3747

NOTIFICATION DATE	DELIVERY MODE
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11/14/2012

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mitdocket@mit.edu
mjoyce@mit.edu

Office Action Summary	Application No.	Applicant(s)	
	13/591,717	COHN ET AL.	
	Examiner	Art Unit	
	HAI HUYNH	3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 22 August 2012.
- 2a) This action is **FINAL**.
- 2b) This action is non-final.
- 3) An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
- 4) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) Claim(s) 38-45 is/are pending in the application.
 - 5a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 6) Claim(s) _____ is/are allowed.
- 7) Claim(s) 38-45 is/are rejected.
- 8) Claim(s) _____ is/are objected to.
- 9) Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) The specification is objected to by the Examiner.
- 11) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 - 1. Certified copies of the priority documents have been received.
 - 2. Certified copies of the priority documents have been received in Application No. _____.
 - 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 3) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 4) Other: _____.

Inventorship

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Specification

2. The disclosure is objected to because of the following informalities: page 1 line 2 after "filed March 2, 2012," should insert "--which is now issued as U.S. Patent No. 8,276,565",
3. line 3 after "filed October 27, 2012," should insert "--which is now issued as U.S. Patent No.8,146,568",
4. line 3 after "filed May 27, 2011," should insert "--which is now issued as U.S. Patent No. 8,069,839",
5. line 4 after "12/815,482 filed June 15, 2010," should insert "--which is now issued as U.S. Patent No. 7,971,572--",
6. line 5 after "12/329,729 filed on December 8, 2008," should insert "--which is now issued as U.S. Patent No. 7,762,233--",

7. line 6 after "11/840,719 filed on August 17, 2007," should insert --which is now issued as U.S. Patent No. 7,740,004--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 43-45 are rejected under 35 U.S.C. 102(e) as being anticipated by Kobayashi (7,188,607).

Kobayashi teaches the second fuel has a higher octane number than the first fuel, and wherein the second fuel is introduced into the cylinder by a direct fuel injector (see abstract, also col. 9 lines 44-65).

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct

from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 38-42 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 26-35 of copending Application No. 12/562,766. Although the conflicting claims are not identical, they are not patentably distinct from each other because they have the same scope.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

12. Claims 38-42 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 15-20 of U.S. Patent No. 8,069,839. Although the conflicting claims are not identical, they are not patentably distinct from each other because they have the same scope.

13. Claims 38-42 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 7,225,787. Although the conflicting claims are not identical, they are not patentably distinct from each other because they have the same scope.

14. Claims 38-42 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-10 of U.S. Patent No. 8,302,580. Although the conflicting claims are not identical, they are not patentably distinct from each other because they have the same scope.

15. Claims 38-42 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 7,444,987. Although the conflicting claims are not identical, they are not patentably distinct from each other because they have the same scope.

16. Claims 38-42 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 7,314,033. Although the conflicting claims are not identical, they are not patentably distinct from each other because they have the same scope.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAI HUYNH whose telephone number is (571)272-4844. The examiner can normally be reached on Monday through Thursday from 7:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Cronin can be reached on (571) 272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hai H. Huynh/

Primary Examiner, Art Unit 3747

Notice of References Cited	Application/Control No. 13/591,717	Applicant(s)/Patent Under Reexamination COHN ET AL.	
	Examiner HAI HUYNH	Art Unit 3747	Page 1 of 2

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*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification	
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*	C	US-7,225,787 B2	06-2007	Bromberg et al.	123/198A
*	D	US-7,314,033 B2	01-2008	Cohn et al.	123/198A
*	E	US-7,320,302 B2	01-2008	Kobayashi, Tatsuo	123/299
*	F	US-7,444,987 B2	11-2008	Cohn et al.	123/431
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*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N				
	O				
	P				
	Q				
	R				
	S				
	T				

NON-PATENT DOCUMENTS

*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)				
	U				
	V				
	W				
	X				

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 13/591,717	Applicant(s)/Patent Under Reexamination COHN ET AL.	
	Examiner HAI HUYNH	Art Unit 3747	Page 2 of 2

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*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
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	C US-			
	D US-			
	E US-			
	F US-			
	G US-			
	H US-			
	I US-			
	J US-			
	K US-			
	L US-			
	M US-			


FOREIGN PATENT DOCUMENTS

*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
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	P				
	Q				
	R				
	S				
	T				

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	Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)				
	U				
	V				
	W				
	X				

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747

SEARCHED			
Class	Subclass	Date	Examiner
123	1A,198A, 299, 300, 304, 305, 575, 431, 436, 27GE, 525	11/7/2012	HHH

SEARCH NOTES		
Search Notes	Date	Examiner
East	11/7/2012	HHH

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
above	search	11/7/2012	HHH

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EAST Search History

EAST Search History (Prior Art)

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L3	1	("7587998").URPN.	USPAT	OR	OFF	2012/11/07 13:16
L4	2	("5515814" "6318306").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/11/07 13:16
L5	5	("7556030").URPN.	USPAT	OR	OFF	2012/11/07 13:21
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		"5941210" "6227151" "6341487" "6354264" "6390057" "6394064" "6659071" "6684849" "6684852").PN.				
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L21	2	(10/607128).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/11/07 15:14
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S2	188	gasoline same ethanol same (octane near number) same increas\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:11
S3	75	gasoline same ethanol same (octane near number) same increas\$3 same engine	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:12
S4	4	gasoline same ethanol same (octane near number) same increas\$3 same engine same vaporiz\$5 same cool\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:13
S5	5	gasoline same ethanol same (octane near number) same increas\$3 same vaporiz\$5 same cool\$3	US-PGPUB; USPAT; USOCR;	OR	OFF	2012/11/06 14:13


			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S6	39	(first or main) same (second\$3 or auxiliary) same (fuel near inject\$3) same (octane near number)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:18
S7	6109	((123/1A) or (123/198A) or (123/299) or (123/300) or (123/575) or (123/431) or (123/436) or (123/27GE) or (123/525)).OCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/11/06 14:51
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S9	36	S2 and S7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:51
S10	31	S3 and S7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:52
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S12	3	S5 and S7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:52
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S16	0	("2012/0143474").URPN.	USPAT	OR	OFF	2012/11/07

<i>Index of Claims</i> 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claims renumbered in the same order as presented by applicant
 CPA
 T.D.
 R.1.47

CLAIM		DATE						
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<i>Index of Claims</i> 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claims renumbered in the same order as presented by applicant
 CPA
 T.D.
 R.1.47

CLAIM		DATE							
Final	Original	11/07/2012							
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	38	✓							
	39	✓							
	40	✓							
	41	✓							
	42	✓							
	43	✓							
	44	✓							
	45	✓							

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	558	gasoline same ethanol same (octane near number)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:10
L2	188	gasoline same ethanol same (octane near number) same increas\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:11
L3	75	gasoline same ethanol same (octane near number) same increas\$3 same engine	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:12
L4	4	gasoline same ethanol same (octane near number) same increas\$3 same engine same vaporiz\$5 same cool\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:13
L5	5	gasoline same ethanol same (octane near number) same increas\$3 same vaporiz\$5 same cool\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:13
L6	39	(first or main) same (second\$3 or auxiliary) same (fuel near inject\$3) same (octane near number)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:18
L7	6109	((123/1A) or (123/198A) or (123/299) or (123/300) or (123/575) or (123/431) or (123/436) or (123/27GE) or (123/525)).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/11/06 14:51
L9	79	l1 and l7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:51
L10	36	l2 and l7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/11/06 14:51
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EAST Search History

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BIB DATA SHEET
CONFIRMATION NO. 8123

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
13/591,717	08/22/2012	123	3747	11381.113158		
APPLICANTS Daniel R. Cohn, Cambridge, MA; Leslie Bromberg, Sharon, MA; John B. Heywood, Newtonville, MA;						
** CONTINUING DATA ***** This application is a CON of 13/410,373 03/02/2012 PAT 8,276,565 and is a CON of 13/282,787 10/27/2011 PAT 8,146,568 * and is a CON of 13/117,448 05/27/2011 PAT 8,069,839 * and is a CON of 12/815,842 06/15/2010 PAT 7,971,572 and is a CON of 12/329,729 12/08/2008 PAT 7,762,233 and is a CON of 11/840,719 08/17/2007 PAT 7,740,004 and is a CON of 10/991,774 11/18/2004 PAT 7,314,033 (*)Data provided by applicant is not consistent with PTO records.						
** FOREIGN APPLICATIONS *****						
** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 08/31/2012						
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and /HAI H HUYNH/ Acknowledged Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	STATE OR COUNTRY MA	SHEETS DRAWINGS 3	TOTAL CLAIMS 5	INDEPENDENT CLAIMS 1
ADDRESS MIT's Technology Licensing Office One Cambridge Center Kendall Square, NE 18-501 Cambridge, MA 02142-1493 UNITED STATES						
TITLE FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES						
FILING FEE RECEIVED 1250	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit			

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0821-0001
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	13591717
	Filing Date	2012-06-22
	First Named Inventor	Daniel R. Cohn
	Art Unit	3747
	Examiner Name	HUYNH, HAI H
	Attorney Docket Number	11381.113158

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		13591717
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	First Named Inventor	Daniel R. Cohn	
	Art Unit		3747
	Examiner Name	HUYNH, HAI H	
	Attorney Docket Number		11381.113158

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**INFORMATION DISCLOSURE
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Examiner Name	HUYNH, HAI H
Attorney Docket Number	11381.113158

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**INFORMATION DISCLOSURE
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Art Unit	3747
Examiner Name	HUYNH, HAI H
Attorney Docket Number	11381.113158

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**INFORMATION DISCLOSURE
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Art Unit	3747
Examiner Name	HUYNH, HAI H
Attorney Docket Number	11381.113158

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49	6622663		2003-09-23	Weisman et al.	
50	6668804		2003-12-30	Dobryden et al.	
51	6725827		2004-04-27	Ueda et al.	
52	6981202		2005-10-04	Oda, Tomihisa	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		13591717	
	Filing Date		2012-08-22	
	First Named Inventor		Daniel R. Cohn	
	Art Unit		3747	
	Examiner Name		HUYNH, HAI H	
	Attorney Docket Number		11381.113158	

53	7021277		2006-04-04	Kuo et al.	
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58	3089470		1963-05-14	Payne, W.H.	
59	4182278		1960-01-08	Coakwell, Charles A.	
60	7013647		2006-03-21	Auer, Gerhard	

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U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	13591717
	Filing Date	2012-08-22
	First Named Inventor	Daniel R. Cohn
	Art Unit	3747
	Examiner Name	HUYNH, HAI H
	Attorney Docket Number	11381.113158

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ²	Country Code ² (1)	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ³
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	1	A. MODAK and L.S. CARETIO, Engine Cooling by Direct Injection of Cooling Water, Society of Automotive Engineers, Inc.700887					<input type="checkbox"/>
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	3	BORJE GRANDIN, HANS-ERIK ANGSTROM, PER STALHAMMAR and ERIC OLOFSSON, Knock Suppression in a Turbocharged SI Engine by Using Cooled EGR, Society of Automotive Engineers, Inc. 982476, International Fall Fuels and Lubricants Meeting and Exposition in San Francisco, California (October 19-22, 1998)					<input type="checkbox"/>
	4	C. STAN, R. TROEGER, S. GUENTHER, A. STANCIU, L. MARTORANO, C. TARANTINO and R. LENSJ, Internal Mixture Formation and Combustion from Gasoline to Ethanol, Society of Automotive Engineers, Inc.2001-01-1207					<input type="checkbox"/>
	5	PCT International Search Report and Written Opinion, Appl. No. PCT/US05/041317, April 8, 2006.					<input type="checkbox"/>
	6	BORJE GRANDIN and HANS-ERIK ANGSTROM, Replacing Fuel Enrichment in a Turbo Charged SI Engine: Lean Burn or Cooled EGR, Society of Automotive Engineers, Inc. 199-01-3505					<input type="checkbox"/>
	7	PCT International Search Report and Written Opinion, Appl. No. PCT/US05/012750, June 28, 2007.					<input type="checkbox"/>

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	13591717
	Filing Date	2012-06-22
	First Named Inventor	Daniel R. Cohn
	Art Unit	3747
	Examiner Name	HUYNH, HAI H
	Attorney Docket Number	11381.113158

8	USPTO Notice of Allowance, Application No. 11/654100, March 3, 2009.	<input type="checkbox"/>
9	USPTO Non-Final Office Action, Application No. 11/540719, July 11, 2008.	<input type="checkbox"/>
10	J.B. HEYWOOD, "Internal Combustion Engine Fundamentals," McGraw Hill, 1998, page 477.	<input type="checkbox"/>
11	J. STOKES ET AL. "A gasoline engine concept for improved fueleconomy- the lean-boost system," SAE paper 2001-01-2902, pp. 1-12.	<input type="checkbox"/>
12	H.J. CURRAN ET AL., "A comprehensive modeling study of iso-octane oxidation," Combustion and Flame 129:263-260 (2002) pp. 253-280.	<input type="checkbox"/>
13	B. LECOINTE AND G. MONNIER, "Downsizing a gasoline engine using turbocharging with direct injection" SAE paper 2003-01-0542.	<input type="checkbox"/>
14	USPTO Non-Final Office Action, Application No. 10/991774, April 25, 2008	<input type="checkbox"/>
15	USPTO Final Office Action, Application No. 10/991774, September 27, 2008.	<input type="checkbox"/>
16	USPTO Non-Final Office Action, Application No. 10/991774, May 25, 2007.	<input type="checkbox"/>
17	USPTO Non-Final Office Action, Application No. 11/100026, August 3, 2008.	<input type="checkbox"/>
18	FIKRET YUKSEL and BEDRI YUKSEL, "The Use of Ethanol-Gasoline Blend as a Fuel in an SI Engine," Renewable Energy, Vol. 29 (2004) pp. 1181-1191.	<input type="checkbox"/>

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	13591717
	Filing Date	2012-08-22
	First Named Inventor	Daniel R. Cohn
	Art Unit	3747
	Examiner Name	HUYNH, HAI H
	Attorney Docket Number	11381.113158

19	USPTO Non-Final Office Action, Application No. 11/229755, March 22, 2007.	<input type="checkbox"/>
20	USPTO Non-Final Office Action, Application No. 11/229755, October 4, 2007.	<input type="checkbox"/>
21	USPTO Non-Final Office Action, Application No. 11/692372, January 2, 2008.	<input type="checkbox"/>
22	USPTO Final Office Action, Application No. 11/692372, October 17, 2008.	<input type="checkbox"/>
23	USPTO Non-Final Office Action, Application No. 11/684100, June 3, 2008.	<input type="checkbox"/>
24	PCT International Search Report and Written Opinion, Application No. PCT/1807/03004, July 9, 2008.	<input type="checkbox"/>
25	PCT international Search Report and Written Opinion, Application No. PCT/US07/05777, March 24, 2008.	<input type="checkbox"/>
26	PCT International Search Report and Written Opinion, Application No. PCT/US07/74227, February 25, 2008.	<input type="checkbox"/>
27	PCT International Search Report and Written Opinion, Application No. PCT/US08/99171, October 3, 2008.	<input type="checkbox"/>

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Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	13591717
Filing Date	2012-08-22
First Named Inventor	Daniel R. Cohn
Art Unit	3747
Examiner Name	HUYNH, HAI H
Attorney Docket Number	11381.113158

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	13591717	
	Filing Date	2012-06-22	
	First Named Inventor	Daniel R. Cohn	
	Art Unit	3747	
	Examiner Name	HUYNH, HAI H	
	Attorney Docket Number	11381.113158	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).


See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	2012-12-10
Name/Print	Sam Pasternack	Registration Number	29576

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Electronic Acknowledgement Receipt

EFS ID:	14426864
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	10-DEC-2012
Filing Date:	22-AUG-2012
Time Stamp:	16:13:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	11381113158IDSLetter.pdf	184164 b8ab7b33546dbe80b478fa95447f876be47b1e5	no	2

Warnings:

Information:

2	Information Disclosure Statement (IDS) Form (SB08)	11381113158IDS.pdf	1532489 baa63373ab3445b575d1e85190465032f4d4c24f	no	11
Warnings:					
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Application No. 13/591,717
Date: 12/10/2012

Docket No.: 11381.113158

If there is a fee occasioned by this communication, the director hereby authorized to charge any deficiency or credit any overpayment in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 192553, under Docket No. 11381.113158.

Respectfully Submitted,



Sam (Bo) Pasternack
Registration Number: 29576
Massachusetts Institute of Technology
One Cambridge Center
Room NE18-501
Cambridge, MA 02142
617.258.7171



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Table with 4 columns: APPLICATION NUMBER (13/591,717), FILING OR 371(C) DATE (08/22/2012), FIRST NAMED APPLICANT (Daniel R. Cohn), ATTY. DOCKET NO./TITLE (11381.113158)

CONFIRMATION NO. 8123

PUBLICATION NOTICE



0C000000058139869

91197
MIT's Technology Licensing Office
One Cambridge Center
Kendall Square, NE 18-501
Cambridge, MA 02142-1493

Title:FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

Publication No.US-2012-0312284-A1

Publication Date:12/13/2012

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The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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11381.113158

In re Application of: Daniel R. Cohn et al.

Application No.: 13/591717

Filed: 22-Aug-2012

For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

The owner*, Massachusetts Institute of Technology, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending reference Application Number 12/562766, filed 18-Sep-2009, as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the reference application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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2. The undersigned is an attorney or agent of record. Reg. No. 28578


Signature

February 12, 2013
DateSam Pasternack
Typed or printed name617-253-6906
Telephone Number

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REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)

11381.113158

In re Application of: Daniel R. Cohn et al.

Application No.: 13/591717

Filed: 22-Aug-2012

For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

The owner, Massachusetts Institute of Technology, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. 8,302,590 as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
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- is released; or
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2. The undersigned is an attorney or agent of record. Reg. No. 26576


Signature

February 12, 2013

Date

Sam Pasternack
Typed or printed name

617-253-6266
Telephone Number

- Terminal disclaimer fee under 37 CFR 1.20(d) included.

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REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)
11381.113158

In re Application of: Daniel R. Cohn et al.

Application No.: 13/581717

Filed: 22-Aug-2012

For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

The owner, Massachusetts Institute of Technology, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. 7,444,287, as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. The undersigned is an attorney or agent of record. Reg. No. 29976


Signature

February 12, 2013
Date

Sam Pasternack
Typed or printed name

617-253-6968
Telephone Number

- Terminal disclaimer fee under 37 CFR 1.20(d) included.

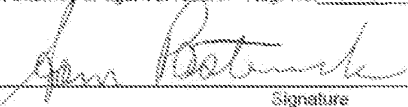
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In re Application of: Daniel R. Cohn et al.	
Application No.: 13/591717	
Filed: 22-Aug-2012	
For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES	
<p>The owner, <u>Massachusetts Institute of Technology</u>, of <u>100</u> percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. <u>7,314,033</u> as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.</p>	
<p>In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:</p> <ul style="list-style-type: none"> expires for failure to pay a maintenance fee; is held unenforceable; is found invalid by a court of competent jurisdiction; is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321; has all claims canceled by a reexamination certificate; is released; or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer. 	
Check either box 1 or 2 below, if appropriate.	
1. <input type="checkbox"/> For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.	
<p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.</p>	
2. <input checked="" type="checkbox"/> The undersigned is an attorney or agent of record. Reg. No. <u>28570</u>	
 Signature	<u>February 12, 2013</u> Date
<u>Sam Pesternack</u> Typed or printed name	
<u>617-253-6966</u> Telephone Number	
<input checked="" type="checkbox"/> Terminal disclaimer fee under 37 CFR 1.20(d) included.	
<p>WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.</p>	
<p>*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). Form PTO/SB/96 may be used for making this certification. See MPEP § 324.</p>	

This collection of information is required by 37 CFR 1.321. This information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1480, Alexandria, VA 22313-1480. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1460, Alexandria, VA 22313-1460.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal

Application Number:	13591717			
Filing Date:	22-Aug-2012			
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES			
First Named Inventor/Applicant Name:	Daniel R. Cohn			
Filer:	Sam Pasternack/Abram Barrett			
Attorney Docket Number:	11381.113158			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Statutory or terminal disclaimer	1814	1	160	160
Total in USD (\$)				160

Electronic Acknowledgement Receipt

EFS ID:	14940253
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	12-FEB-2013
Filing Date:	22-AUG-2012
Time Stamp:	16:05:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$160
RAM confirmation Number	2992
Deposit Account	192553
Authorized User	SPIRIDIGLIOZZI, KAY
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	11381113158Amendment.pdf	401744 3b0108e2575976496689bf127564f12a393d8b81	no	4
Warnings:					
Information:					
2	Terminal Disclaimer Filed	1_TD.pdf	213742 970cb1bb3c685c9e82aabda00565f045c7b757fe	no	1
Warnings:					
Information:					
3	Terminal Disclaimer Filed	2_TD.pdf	195048 f683d866d06d5185beb37a793f06b5eeb1e817bc	no	1
Warnings:					
Information:					
4	Terminal Disclaimer Filed	3_TD.pdf	193753 ffd95969ad75fe2f8df4ed0835cdb03d95b67032	no	1
Warnings:					
Information:					
5	Terminal Disclaimer Filed	4_TD.pdf	195443 b8efb111d4778aee4e3f2dc9e294a12833c97644	no	1
Warnings:					
Information:					
6	Terminal Disclaimer Filed	5_TD.pdf	195616 85267b2ecbc4cc6ed28fd2a16308c69890bb364	no	1
Warnings:					
Information:					
7	Terminal Disclaimer Filed	6_TD.pdf	195339 322509b1046fbd8f5376d784d1947677739d0120	no	1
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	30485 2a22efd40cc1790c54f13b2fe2a37f9a10c7557d	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1621170		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)

11361.113158

In re Application of: Daniel R. Cohn et al.

Application No.: 13/091717

Filed: 22-Aug-2012

For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

The owner, Massachusetts Institute of Technology, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. 7,225,787 as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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expires for failure to pay a maintenance fee;

is held unenforceable;

is found invalid by a court of competent jurisdiction;

is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;

has all claims canceled by a reexamination certificate;

is released; or


is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. The undersigned is an attorney or agent of record. Reg. No. 29576


Signature

February 12, 2013

Date

Sam Pasternack
Typed or printed name

817-253-6886
Telephone Number

- Terminal disclaimer fee under 37 CFR 1.29(d) included.

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*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/06 may be used for making this certification. See MPEP § 324.

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If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

ATTORNEY DOCKET NO.: 11381.113158
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Daniel R. Cohn et al.

Examiner: HUYNH, HAI H

Serial No.: 13/591717

Art Unit: 3747

Filing Date: 22-Aug-2012

Confirmation No.: 8123

Title: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE
ENHANCEMENT OF GASOLINE ENGINES

AMENDMENT

Via EFS-Web

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

In response to the office action bearing notification date of November 14, 2012, please amend the application as follows.

In the Specification

Please amend paragraph [0001] on page 1 as follows.

This application is a continuation of United States patent application number 13/410373 filed March 2, 2012, which is now issued as U. S. patent number 8,276,565, which is a continuation of United States patent application number 13/282787 filed October 27, 2012, which is now issued as U. S. patent number 8,146,568, which is a continuation of 13/117,448 filed May 27, 2011 which is now issued as U. S. patent number 8,069,839, which is a continuation of 12/815842, filed June 15, 2010 which is now issued as U. S. patent number 7,971,572, which is a continuation of United States patent application number 12/329729 filed on December 8, 2008, which is now issued as U. S. patent number 7,762,233, which is a continuation of United States patent application number 11/840719, filed on August 17, 2007 which is now issued as U. S. patent number 7,740,004, which is a continuation of United States patent application number 10/991,774, which is now issued as United States patent number 7,314,033.

Listing of Claims

Claims 1 - 37 (Cancelled)

38. (Previously Presented) A spark ignition engine which is fueled with gasoline and ethanol where fuel is introduced into the engine in such a way that liquid ethanol vaporizes in at least one engine cylinder and vaporization cooling from the ethanol enhances the octane number at a rate of at least 15 octane numbers for an increase from 0 to 100% in the ethanol fraction of fuel in the cylinder.

39. (Previously Presented) The spark ignition engine of claim 38 where ethanol is introduced into at least one engine cylinder by direct injection.

40. (Previously Presented) A spark ignition engine which is fueled with gasoline and ethanol and where the fuel is introduced into at least one cylinder in such a way that the octane number is enhanced by use of ethanol at a rate of at least 30 octane numbers for an increase from 0 to 100% in the ethanol fraction of fuel in the cylinder.

41. (Previously Presented) The spark ignition engine of claim 40 where ethanol vaporizes inside at least one engine cylinder and the octane enhancement from vaporization cooling increases with ethanol use at a rate of at least 15 octane numbers for an increase from 0 to 100 % in the ethanol fraction of fuel in the cylinder.

42. (Previously Presented) The spark ignition engine of claims 40 or 41 where ethanol is introduced into the cylinder by direct injection.

Claims 43 - 45 (Cancelled)

Remarks

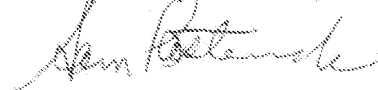
Re-examination and reconsideration of the rejections are hereby requested.

Claims 38-45 are pending in this application. Claims 38-42 are rejected on the ground of nonstatutory obviousness-type double patenting. Enclosed herewith are terminal disclaimers disclaiming the terminal portion of the application and patents over which the claims stand rejected on the ground of nonstatutory obviousness-type double patenting.

Claims 43-45, rejected under 35USC102(e) as anticipated by Kobayashi, are canceled herein to expedite prosecution.

Because claims 38-42 are rejected only under obviousness-type double patenting, it is submitted that these claims are in condition for allowance in view of the terminal disclaimers submitted herewith. These claims, 38-42, are therefore in condition for allowance and early favorable action is requested.

Respectfully Submitted,



Sam (Bo) Pasternack
Registration Number: 29576
Massachusetts Institute of Technology
One Cambridge Center
Room NE18-501
Cambridge, MA 02142
617.258.7171

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**TERMINAL DISCLAIMER TO OBTAIN A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)

11381.113168

In re Application of: Daniel R. Cohn et al.

Application No.: 13/591717

Filed: 22-Aug-2012

For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

The owner, Massachusetts Institute of Technology, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. 8,099,829 as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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expires for failure to pay a maintenance fee;

is held unenforceable;

is found invalid by a court of competent jurisdiction;

is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;

has all claims canceled by a reexamination certificate;

is released; or

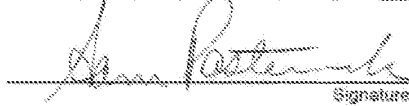
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. The undersigned is an attorney or agent of record. Reg. No. 28576



Signature

February 12, 2013

Date

Sam Paschmark
Typed or printed name

817-251-6266
Telephone number

- Terminal disclaimer fee under 37 CFR 1.29(d) included.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 13/591,717	Filing Date 08/22/2012	<input type="checkbox"/> To be Mailed		
APPLICATION AS FILED – PART I					OTHER THAN SMALL ENTITY				
(Column 1)		(Column 2)		SMALL ENTITY <input type="checkbox"/>		OR			
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	RATE (\$)	FEE (\$)			
<input type="checkbox"/> BASIC FEE <small>(37 CFR 1.16(a), (b), or (c))</small>	N/A	N/A	N/A		N/A				
<input type="checkbox"/> SEARCH FEE <small>(37 CFR 1.16(k), (l), or (m))</small>	N/A	N/A	N/A		N/A				
<input type="checkbox"/> EXAMINATION FEE <small>(37 CFR 1.16(o), (p), or (q))</small>	N/A	N/A	N/A		N/A				
TOTAL CLAIMS <small>(37 CFR 1.16(i))</small>	minus 20 =	*	X \$ =		OR	X \$ =			
INDEPENDENT CLAIMS <small>(37 CFR 1.16(h))</small>	minus 3 =	*	X \$ =		OR	X \$ =			
<input type="checkbox"/> APPLICATION SIZE FEE <small>(37 CFR 1.16(s))</small>	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT <small>(37 CFR 1.16(j))</small>									
* If the difference in column 1 is less than zero, enter "0" in column 2.									
APPLICATION AS AMENDED – PART II					OTHER THAN SMALL ENTITY				
(Column 1)		(Column 2)		SMALL ENTITY		OR			
AMENDMENT	DATE	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)		
	02/12/2013	*	6	Minus	** 20	=	0		
	Total <small>(37 CFR 1.16(i))</small>	*	2	Minus	*** 3	=	0		
	Independent <small>(37 CFR 1.16(h))</small>								
<input type="checkbox"/> Application Size Fee <small>(37 CFR 1.16(s))</small>									
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small>									
						TOTAL ADD'L FEE	OR	TOTAL ADD'L FEE	
								0	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR	
AMENDMENT	DATE	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
		*		Minus	**	=		OR	X \$ =
	Total <small>(37 CFR 1.16(i))</small>	*		Minus	***	=		OR	X \$ =
	Independent <small>(37 CFR 1.16(h))</small>								
<input type="checkbox"/> Application Size Fee <small>(37 CFR 1.16(s))</small>									
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small>									
						TOTAL ADD'L FEE	OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.									
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".									
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".									
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.									
						Legal Instrument Examiner: /STELLA LITTLE/			

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Application Number 	Application/Control No. 13/591,717	Applicant(s)/Patent under Reexamination COHN ET AL.	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	<input type="checkbox"/> APPROVED	<input checked="" type="checkbox"/> DISAPPROVED
Date Filed : 12 FEB 2013	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Six TDs filed and disapproved; no Power of Attorney on record in the file.
 Five more fees under 37 cfr 1.20(d) are due.
 The TDs must be resubmitted.

JAB



UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
13/591,717 08/22/2012 Daniel R. Cohn 11381.113158 8123

91197 7590 02/26/2013
MIT's Technology Licensing Office
One Cambridge Center
Kendall Square, NE 18-501
Cambridge, MA 02142-1493

EXAMINER

HUYNH, HAI H

ART UNIT PAPER NUMBER

3747

NOTIFICATION DATE DELIVERY MODE

02/26/2013

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mitdocket@mit.edu
mjoyce@mit.edu

Office Action Summary	Application No.	Applicant(s)	
	13/591,717	COHN ET AL.	
	Examiner	Art Unit	
	HAI HUYNH	3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 12 February 2013.
- 2a) This action is **FINAL**.
- 2b) This action is non-final.
- 3) An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
- 4) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) Claim(s) 38-42 is/are pending in the application.
 - 5a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 6) Claim(s) _____ is/are allowed.
- 7) Claim(s) 38-42 is/are rejected.
- 8) Claim(s) _____ is/are objected to.
- 9) Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) The specification is objected to by the Examiner.
- 11) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 - 1. Certified copies of the priority documents have been received.
 - 2. Certified copies of the priority documents have been received in Application No. _____.
 - 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 3) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 4) Other: _____.

Terminal Disclaimer

The disclaimer fee in accordance with 37 CFR 1.20(d) has not been submitted, nor is there any authorization in the application file to charge a specified Deposit Account or credit card.

1. An attorney or agent, not of record, is not authorized to sign a terminal disclaimer in the capacity as an attorney or agent acting in a representative capacity as provided by 37 CFR 1.34 (a). See 37 CFR 1.321(b) and/or (c).
2. The assignee has not established its ownership interest in the application, in order to support the terminal disclaimer. There is no submission in the record establishing the ownership interest by either (a) providing documentary evidence of a chain of title from the original inventor(s) to the assignee and a statement affirming that the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11, or (b) specifying (by reel and frame number) where such documentary evidence is recorded in the Office (37 CFR 3.73(b)).


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAI HUYNH whose telephone number is (571)272-4844. The examiner can normally be reached on Monday through Thursday from 7:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Cronin can be reached on (571) 272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


/Hai H. Huynh/
Primary Examiner, Art Unit 3747

Index of Claims 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claims renumbered in the same order as presented by applicant
 CPA
 T.D.
 R.1.47

CLAIM		DATE							
Final	Original	11/07/2012	02/20/2013						
	1	-	-						
	2	-	-						
	3	-	-						
	4	-	-						
	5	-	-						
	6	-	-						
	7	-	-						
	8	-	-						
	9	-	-						
	10	-	-						
	11	-	-						
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	28	-	-						
	29	-	-						
	30	-	-						
	31	-	-						
	32	-	-						
	33	-	-						
	34	-	-						
	35	-	-						
	36	-	-						

Index of Claims 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claims renumbered in the same order as presented by applicant
 CPA
 T.D.
 R.1.47

CLAIM		DATE							
Final	Original	11/07/2012	02/20/2013						
	37	-	-						
	38	✓	✓						
	39	✓	✓						
	40	✓	✓						
	41	✓	✓						
	42	✓	✓						
	43	✓	-						
	44	✓	-						
	45	✓	-						

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	13/591717
	Filing Date	August 22, 2012
	First Named Inventor	Daniel R. Cohn
	Title	FUEL MANAGEMENT SYSTEM..
	Art Unit	3747
	Examiner Name	HUYNH, HAI H
	Attorney Docket Number	11381.113158

I hereby revoke all previous powers of attorney given in the above-identified application.

A Power of Attorney is submitted herewith.

OR

I hereby appoint Practitioner(s) associated with the following Customer Number 91197 to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

OR

I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified application to:

The address associated with the above-mentioned Customer Number.

OR

The address associated with Customer Number:

OR

Firm or Individual Name:

Address:

City: State: Zip:

Country:

Telephone: Email:

I am the:

Applicant/Inventor.

OR

Assignee of record of the entire interest. See 37 CFR 3.71. Filed Herewith

STATEMENT under 37 CFR 3.73(b) (Form PTO/SB/95) submitted herewith or filed on _____

SIGNATURE of Applicant or Assignee of Record

Signature	<i>Kay Spindigloza</i>	Date	02/25/2013
Name	Kay Spindigloza	Telephone	617-253-6966
Title and Company	Manager of Patent Admin, Massachusetts Institute of Technology		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

*Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA, 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Daniel R. Cohn

Application No./Patent No.: 13/591,717 Filed/Issue Date: 08-22-2012

Titled: **FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES**

Massachusetts Institute of Technology, a Non-Profit
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

- 1. the assignee of the entire right, title, and interest in;
 - 2. an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or
 - 3. the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)
- the patent application/patent identified above, by virtue of either:

A. An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 024009, Frame 0795, or for which a copy therefore is attached.

OR

B. A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

Additional documents in the chain of title are listed on a supplemental sheet(s).

As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Kay Spindiglotz
Signature

02/25/2013
Date

Kay Spindiglotz
Printed or Typed Name

Manager Patent Admin.
Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22315-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1468, Alexandria, VA 22312-1468.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	15048572
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	26-FEB-2013
Filing Date:	22-AUG-2012
Time Stamp:	10:46:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	11381113158POA.pdf	206630 f70a5b6f961f53bae7e67d96d1f2ee42c7d134d9	no	1

Warnings:

Information:

2	Assignee showing of ownership per 37 CFR 3.73.	11381113158Statement373b.pdf	191351 56a0921e28a4f2d3921710a5d04f6b35b015a424	no	1
Warnings:					
Information:					
Total Files Size (in bytes):				397981	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

TERMINAL DISCLAIMER TO OBTAIN A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATIONDocket Number (Optional)
11381.113158

In re Application of: Daniel R. Cohn et al.

Application No.: 13/591717

Filed: 22-Aug-2012

For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

The owner*, Massachusetts Institute of Technology, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending reference Application Number 12/562766, filed 18-Sep-2009, as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the reference application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said reference application, "as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application," in the event that: any such patent: granted on the pending reference application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. The undersigned is an attorney or agent of record. Reg. No. 28578



Signature

February 12, 2013

Date

Sam Pasternack

Typed or printed name

617-253-6906

Telephone Number

- Terminal disclaimer fee under 37 CFR 1.20(d) is included.

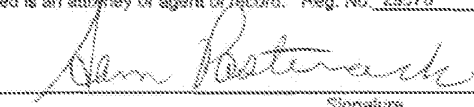
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2938.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).

Form PTO/SB/98 may be used for making this statement. See MPEP § 524.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

TERMINAL DISCLAIMER TO OBIVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT		Docket Number (Optional) 11381.113158
In re Application of: Daniel R. Cohn et al. Application No.: 13/591717 Filed: 22-Aug-2012 For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES		
The owner*, <u>Massachusetts Institute of Technology</u> , of <u>100</u> percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. <u>8,302,590</u> as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.		
In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later: <ul style="list-style-type: none"> expires for failure to pay a maintenance fee; is held unenforceable; is found invalid by a court of competent jurisdiction; is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321; has all claims canceled by a reexamination certificate; is reissued; or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer. 		
Check either box 1 or 2 below, if appropriate.		
1. <input type="checkbox"/> For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.		
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.		
2. <input checked="" type="checkbox"/> The undersigned is an attorney or agent of record. Reg. No. <u>26576</u>		
 Signature		February 12, 2013 Date
Sam Pasternack Typed or printed name		517-253-6266 Telephone Number
<input checked="" type="checkbox"/> Terminal disclaimer fee under 37 CFR 1.20(d) included.		
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.		
*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). Form PTO/SB/96 may be used for making this certification. See MPEP § 324.		

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1480, Alexandria, VA 22313-1480. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1460, Alexandria, VA 22313-1460.

If you need assistance in completing the form, call 1-800-PTO-2193 and select option 2.

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**TERMINAL DISCLAIMER TO OBLIATE A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)
11381.113158

In re Application of: Daniel R. Cohn et al.

Application No.: 13/581717

Filed: 22-Aug-2012

For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

The owner, Massachusetts Institute of Technology, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. 7,444,287, as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

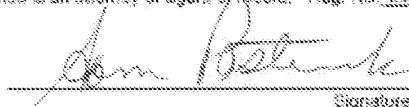
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. The undersigned is an attorney or agent of record. Reg. No. 29976


Signature

February 12, 2013
Date

Sam Pasternack
Typed or printed name

617-253-6988
Telephone Number

- Terminal disclaimer fee under 37 CFR 1.20(d) included.

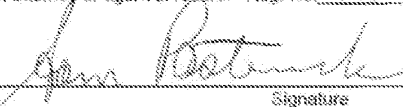
WARNING: information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/06 may be used for making this certification. See MPEP § 324.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit for the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TERMINAL DISCLAIMER TO OBIVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 11361.113158
In re Application of: Daniel R. Cohn et al.	
Application No.: 13/591717	
Filed: 22-Aug-2012	
For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES	
<p>The owner, <u>Massachusetts Institute of Technology</u>, of <u>100</u> percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. <u>7,314,033</u> as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.</p>	
<p>In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:</p> <ul style="list-style-type: none"> expires for failure to pay a maintenance fee; is held unenforceable; is found invalid by a court of competent jurisdiction; is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321; has all claims canceled by a reexamination certificate; is released; or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer. 	
Check either box 1 or 2 below, if appropriate.	
1. <input type="checkbox"/> For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.	
<p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.</p>	
2. <input checked="" type="checkbox"/> The undersigned is an attorney or agent of record. Reg. No. <u>28576</u>	
 Signature	<u>February 12, 2013</u> Date
<u>Sam Pesternack</u> Typed or printed name	
<u>617-253-6966</u> Telephone Number	
<input checked="" type="checkbox"/> Terminal disclaimer fee under 37 CFR 1.20(d) included.	
<p>WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.</p>	
<p>*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). Form PTO/SB/96 may be used for making this certification. See MPEP § 324.</p>	

This collection of information is required by 37 CFR 1.321. This information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1480, Alexandria, VA 22313-1480. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1460, Alexandria, VA 22313-1460.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal

Application Number:	13591717			
Filing Date:	22-Aug-2012			
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES			
First Named Inventor/Applicant Name:	Daniel R. Cohn			
Filer:	Sam Pasternack/Abram Barrett			
Attorney Docket Number:	11381.113158			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Statutory or terminal disclaimer	1814	5	160	800
Total in USD (\$)				800

Electronic Acknowledgement Receipt

EFS ID:	15054463
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	26-FEB-2013
Filing Date:	22-AUG-2012
Time Stamp:	15:41:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$800
RAM confirmation Number	2662
Deposit Account	192553
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees) Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer Filed	1_TD.pdf	213742 970cb1bb3c685c9e82aabda00565f045c7b757fe	no	1
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Information:					
2	Terminal Disclaimer Filed	2_TD.pdf	195048 f683d866d06d5185beb37a793f06b5eeb1e817bc	no	1
Warnings:					
Information:					
3	Terminal Disclaimer Filed	3_TD.pdf	193753 ffdf95969ad75fe2f8df4ed0835cdeb03d95b67032	no	1
Warnings:					
Information:					
4	Terminal Disclaimer Filed	4_TD.pdf	195443 b8efb111d4778aee4e3f2dc9e294a12833c57644	no	1
Warnings:					
Information:					
5	Terminal Disclaimer Filed	5_TD.pdf	195616 85267b2ecbc4cc6e428fd2a16308c69890bb364	no	1
Warnings:					
Information:					
6	Terminal Disclaimer Filed	6_TD.pdf	195339 322509b1046fbd8f5376d784d1947677739d0120	no	1
Warnings:					
Information:					
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Warnings:					
Information:					
Total Files Size (in bytes):			1219457		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**TERMINAL DISCLAIMER TO OBTAIN A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)

11381.113168

In re Application of: Daniel R. Cohn et al.

Application No.: 13/591717

Filed: 22-Aug-2012

For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

The owner, Massachusetts Institute of Technology, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. 8,099,829 as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

expires for failure to pay a maintenance fee;

is held unenforceable;

is found invalid by a court of competent jurisdiction;

is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;

has all claims canceled by a reexamination certificate;

is released; or

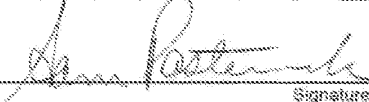
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. The undersigned is an attorney or agent of record. Reg. No. 28576


Signature

February 12, 2013

Date

Sam Paschmark
Typed or printed name

817-253-6266
Telephone number

- Terminal disclaimer fee under 37 CFR 1.29(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/26 may be used for making this certification. See MPEP § 324.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1480, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1480, Alexandria, VA 22313-1480.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**TERMINAL DISCLAIMER TO OBIVIATE A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)

11361.113158

In re Application of: Daniel R. Cohn et al.

Application No.: 13/091717

Filed: 22-Aug-2012

For: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

The owner, Massachusetts Institute of Technology, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent No. 7,225,787 as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

expires for failure to pay a maintenance fee;

is held unenforceable;

is found invalid by a court of competent jurisdiction;

is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;

has all claims canceled by a reexamination certificate;

is released; or


is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. The undersigned is an attorney or agent of record. Reg. No. 29576


Signature

February 12, 2013

Date

Sam Pasternack
Typed or printed name

817-253-6886
Telephone Number


- Terminal disclaimer fee under 37 CFR 1.29(d) included.

WARNING: information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
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If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Application Number 	Application/Control No. 13/591,717	Applicant(s)/Patent under Reexamination COHN ET AL.	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED
Date Filed : February 26, 2013	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
Henry D. Jefferson 6 td's are approved

U.S. Patent and Trademark Office



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/591,717	08/22/2012	Daniel R. Cohn	11381.113158

CONFIRMATION NO. 8123

POA ACCEPTANCE LETTER



OC00000059674424

91197
MIT's Technology Licensing Office
One Cambridge Center
Kendall Square, NE 18-501
Cambridge, MA 02142-1493

Date Mailed: 03/06/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/26/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/gbien-aime/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

ATTORNEY DOCKET NO.: 11381.113158
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Daniel R. Cohn et al.

Examiner: HUYNH, HAI H

Serial No.: 13/591,717

Art Unit: 3747

Filing Date: 08-22-2012

Confirmation No.: 8123

Title: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE
ENHANCEMENT OF GASOLINE ENGINES

Via EFS-Web

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

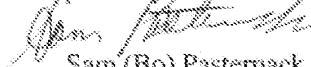
In response to the Office Action dated February 26, 2013, we are submitting the following documents at the request of Examiner Huynh.

1. Terminal Disclaimer Review Decision
2. Acceptance of Power of Attorney
3. Deposit Account Statement
4. Electronic Acknowledgement Receipt

These documents establish that the Terminal Disclaimers have been accepted, Power of Attorney has been received and fees have been paid.

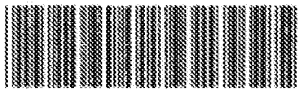
Early favorable action is requested.

Respectfully Submitted,



Sam (Bo) Pasternack
Registration Number: 29576

Massachusetts Institute of Technology
One Cambridge Center
Room NE18-501
Cambridge, MA 02142

Application Number 	Application/Control No. 13/591,717	Applicant(s)/Patent under Reexamination COHN ET AL.
Document Code - DISQ		Internal Document - DO NOT MAIL

TERMINAL DISCLAIMER	<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED
Date Filed : February 26, 2013	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
Henry D. Jefferson 6 td's are approved

U.S. Patent and Trademark Office



**United States
Patent and
Trademark Office**

Deposit Account Statement

Requested Statement Month: February 2013
 Deposit Account Number: 192553
 Name: MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 Attention: LITA NELSEN
 Street Address 1: 77 MASSACHUSETTS AVENUE
 Street Address 2: NE 18-501
 City: CAMBRIDGE
 State: MA
 Zip: 02139
 Country: UNITED STATES

DATE	SEQ	POSTING REF TXT	ATTORNEY DOCKET NBR	FEE CODE	AMT	BAL
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02/04	17551	13323059	15001.111958	1501	\$1,770.00	\$29,480.40
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02/14	20138	11985569	MIT 12172 US	1401	\$630.00	\$21,509.40
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02/27	4638	13591717	11381.113158	1814	\$800.00	\$20,454.40
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		BALANCE	CHARGES	REPLENISH	BALANCE	
		\$31,550.40	\$11,208.00	\$112.00	\$20,454.40	

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Electronic Acknowledgement Receipt

EFS ID:	15054463
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	26-FEB-2013
Filing Date:	22-AUG-2012
Time Stamp:	15:41:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$800
RAM confirmation Number	2662
Deposit Account	192553
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees) Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer Filed	1_TD.pdf	213742 078c2118a307654982a6b94975d076c7767576a	no	1
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Information:					
2	Terminal Disclaimer Filed	2_TD.pdf	195048 8d0c995d06c11007ee773c7920026e78775ac	no	1
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Information:					
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Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	30516 1021197c31580e0851760794c4190707719c40120	no	2
Warnings:					
Information:					
Total Files Size (in bytes):				1219457	

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	15724207
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	08-MAY-2013
Filing Date:	22-AUG-2012
Time Stamp:	15:04:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

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Warnings:

Information:

2	Other Reference-Patent/App/Search documents	11381113158POAAcceptance.pdf	106214 d88807ac59318e9c5ccb85e8ddd3f4186c2e5a	no	1
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Information:					
3	Other Reference-Patent/App/Search documents	11381113158TDAApproval.pdf	109731 cea3790376a3e4091972ab70303dd064006fb97	no	1
Warnings:					
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4	Other Reference-Patent/App/Search documents	11381113158DAS.pdf	148857 24d35b17871e349ec28c499b9583fd6a672a1818b	no	1
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Information:					
Total Files Size (in bytes):				900675	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

ATTORNEY DOCKET NO.: 11381.113158
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Daniel R. Cohn et al.

Examiner: HUYNH, HAI H

Serial No.: 13/591,717

Art Unit: 3747

Filing Date: 08-22-2012

Confirmation No.: 8123

Title: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE
ENHANCEMENT OF GASOLINE ENGINES

Via EFS-Web

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

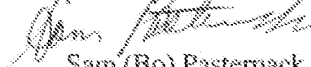
In response to the Office Action dated February 26, 2013, we are submitting the following documents at the request of Examiner Huynh.

1. Terminal Disclaimer Review Decision
2. Acceptance of Power of Attorney
3. Deposit Account Statement
4. Electronic Acknowledgement Receipt

These documents establish that the Terminal Disclaimers have been accepted, Power of Attorney has been received and fees have been paid.

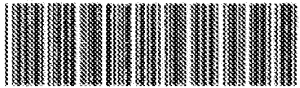
Early favorable action is requested.

Respectfully Submitted,



Sam (Bo) Pasternack
Registration Number: 29576

Massachusetts Institute of Technology
One Cambridge Center
Room NE18-501
Cambridge, MA 02142

Application Number 	Application/Control No. 13/591,717	Applicant(s)/Patent under Reexamination COHN ET AL.
Document Code - DISQ		Internal Document - DO NOT MAIL

TERMINAL DISCLAIMER	<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED
Date Filed : February 26, 2013	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
Henry D. Jefferson 6 td's are approved

U.S. Patent and Trademark Office



**United States
Patent and
Trademark Office**

Deposit Account Statement

Requested Statement Month: February 2013
 Deposit Account Number: 192553
 Name: MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 Attention: LITA NELSEN
 Street Address 1: 77 MASSACHUSETTS AVENUE
 Street Address 2: NE 18-501
 City: CAMBRIDGE
 State: MA
 Zip: 02139
 Country: UNITED STATES

DATE	SEQ	POSTING REF TXT	ATTORNEY DOCKET NBR	FEE CODE	AMT	BAL
02/04	17580	13323059	15001.111958	1504	\$300.00	\$31,260.40
02/04	17551	13323059	15001.111958	1501	\$1,770.00	\$29,480.40
02/04	18325	12744487	13021.109300	1504	\$300.00	\$29,180.40
02/04	18328	12744487	13021.109300	2501	\$885.00	\$28,295.40
02/11	5440	13763090	MIT15448J	2111	\$310.00	\$27,985.40
02/11	5442	13763090	MIT15448J	2202	\$185.00	\$27,799.40
02/11	5441	13763090	MIT15448J	2311	\$125.00	\$27,674.40
02/11	5439	13763090	MIT15448J	4011	\$98.00	\$27,576.40
02/11	8109	PCT/US13/25383		1701	\$1,312.00	\$26,264.40
02/11	8110	PCT/US13/25383		1703	\$208.00	\$26,056.40
02/11	8111	PCT/US13/25383		1704	\$2,419.00	\$23,637.40
02/11	8109	PCT/US13/25383		1601	\$240.00	\$23,397.40
02/13	6	PCT/US12/49371	MIT14989PCT	1703	-\$112.00	\$23,509.40
02/13	7	PCT/US12/49371	MIT 14989PCT	1703	\$80.00	\$23,429.40
02/14	20137	11985569	MIT 12172 US	1253	\$1,290.00	\$22,139.40
02/14	20138	11985569	MIT 12172 US	1401	\$630.00	\$21,509.40
02/20	46	13732541	15387.112915	1051	\$130.00	\$21,379.40
02/26	42295	61769246	MIT14502L	2005	\$125.00	\$21,254.40
02/27	4638	13591717	11381.113158	1814	\$800.00	\$20,454.40
		START BALANCE	SUM OF CHARGES	SUM OF REPLENISH	END BALANCE	
		\$31,550.40	\$11,208.00	\$112.00	\$20,454.40	

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Electronic Acknowledgement Receipt

EFS ID:	15054463
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	26-FEB-2013
Filing Date:	22-AUG-2012
Time Stamp:	15:41:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$800
RAM confirmation Number	2662
Deposit Account	192553
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees) Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)	
1	Terminal Disclaimer Filed	1_TD.pdf	213742 078c2118a30705c4982a4b9a995a076c79c7579a	no	1	
Warnings:						
Information:						
2	Terminal Disclaimer Filed	2_TD.pdf	195048 8a0c2955d0e0c11007ee773c7920020e78779c	no	1	
Warnings:						
Information:						
3	Terminal Disclaimer Filed	3_TD.pdf	193753 61079806c7751a226a44d90137a08a3012c77032	no	1	
Warnings:						
Information:						
4	Terminal Disclaimer Filed	4_TD.pdf	195443 3668b7f114f770e4e07d08e291a720120c1840	no	1	
Warnings:						
Information:						
5	Terminal Disclaimer Filed	5_TD.pdf	195616 65207702a7e6c1c0e428600a7d708c070897a5280	no	1	
Warnings:						
Information:						
6	Terminal Disclaimer Filed	6_TD.pdf	195339 327009c10668a085176079944190707719c407120	no	1	
Warnings:						
Information:						
7	Fee Worksheet (SB06)	fee-info.pdf	30516 1021127c31580e085176079944190707719c407120	no	2	
Warnings:						
Information:						
Total Files Size (in bytes):				1219457		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	15865497
Application Number:	13591717
International Application Number:	
Confirmation Number:	8123
Title of Invention:	FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES
First Named Inventor/Applicant Name:	Daniel R. Cohn
Customer Number:	91197
Filer:	Sam Pasternack/Abram Barrett
Filer Authorized By:	Sam Pasternack
Attorney Docket Number:	11381.113158
Receipt Date:	24-MAY-2013
Filing Date:	22-AUG-2012
Time Stamp:	13:24:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	11381113158ResponseToOA.pdf	117909 <small>155ebc3ac56011186e5592c8ec4645a6132022c0</small>	no	1

Warnings:

Information:

2	Other Reference-Patent/App/Search documents	11381113158TDAApproval.pdf	109731 cea3790376a3e4091972ab70303dd064006fb97	no	1
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	11381113158POAAcceptance.pdf	106214 d88807ac59318e9c5cdebab85e8ddd3f4186c2e5a	no	1
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Information:					
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5	Other Reference-Patent/App/Search documents	11381113158ElectronicAcknowledgementReceipt.pdf	417964 f0c9b3fd611f9dbba160cd310ab210f0cd5c6e6	no	3
Warnings:					
Information:					
Total Files Size (in bytes):				900675	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



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NOTICE OF ALLOWANCE AND FEE(S) DUE

91197 7590 08/23/2013
MIT's Technology Licensing Office
One Cambridge Center
Kendall Square, NE 18-501
Cambridge, MA 02142-1493

EXAMINER

HUYNH, HAI H

ART UNIT PAPER NUMBER

3747

DATE MAILED: 08/23/2013

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.

13/591,717 08/22/2012 Daniel R. Cohn 11381.113158 8123

TITLE OF INVENTION: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

Table with 7 columns: APPLN. TYPE, ENTITY STATUS, ISSUE FEE DUE, PUBLICATION FEE DUE, PREV. PAID ISSUE FEE, TOTAL FEE(S) DUE, DATE DUE

nonprovisional UNDISCOUNTED \$1780 \$300 \$0 \$2080 11/25/2013

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

91197 7590 08/23/2013
MIT's Technology Licensing Office
One Cambridge Center
Kendall Square, NE 18-501
Cambridge, MA 02142-1493

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)
_____ (Signature)
_____ (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,717	08/22/2012	Daniel R. Cohn	11381.113158	8123

TITLE OF INVENTION: FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1780	\$300	\$0	\$2080	11/25/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
HUYNH, HAI H	3747	123-431000

<p>1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).</p> <p><input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.</p> <p><input type="checkbox"/> "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.</p>	<p>2. For printing on the patent front page, list</p> <p>(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____</p> <p>(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____</p> <p>3 _____</p>
---	---

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE _____ (B) RESIDENCE: (CITY and STATE OR COUNTRY) _____

Please check the appropriate assignee category or categories (will not be printed on the patent) : Individual Corporation or other private group entity Government

<p>4a. The following fee(s) are submitted:</p> <p><input type="checkbox"/> Issue Fee</p> <p><input type="checkbox"/> Publication Fee (No small entity discount permitted)</p> <p><input type="checkbox"/> Advance Order - # of Copies _____</p>	<p>4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)</p> <p><input type="checkbox"/> A check is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).</p>
---	--

5. **Change in Entity Status** (from status indicated above)

Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
Row 1: 13/591,717, 08/22/2012, Daniel R. Cohn, 11381.113158, 8123
Row 2: 91197, 7590, 08/23/2013, (Empty), (Empty)
Row 3: MIT's Technology Licensing Office, One Cambridge Center, Kendall Square, NE 18-501, Cambridge, MA 02142-1493, (Empty), (Empty)
Row 4: (Empty), (Empty), (Empty), ART UNIT, PAPER NUMBER
Row 5: (Empty), (Empty), (Empty), 3747, (Empty)

DATE MAILED: 08/23/2013

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/591,717	Applicant(s) COHN ET AL.	
	Examiner HAI HUYNH	Art Unit 3747	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to letter filed 05/25/13.
 A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. The allowed claim(s) is/are 38-42. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) All b) Some *c) None of the:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>12/10/12</u> 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material 4. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Examiner's Amendment/Comment 6. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance 7. <input type="checkbox"/> Other _____. |
|---|---|

/Hai H. Huynh/
Primary Examiner, Art Unit 3747

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	7441	((123/1A) or (123/198A) or (123/299) or (123/300) or (123/304) or (123/305) or (123/575) or (123/431) or (123/436) or (123/27GE) or (123/525)).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/08/12 10:30
L3	8	ethanol same vapor\$7 same (octane near number) same cool\$3 same fraction	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/08/12 10:32
L4	6	ethanol same vapor\$7 same (octane near number) same cool\$3 same fraction same engine	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/08/12 10:32
L5	2	l1 and l3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/08/12 10:32
L6	2	l1 and l4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/08/12 10:33

8/ 12/ 2013 10:35:32 AM

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Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0851-0001
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	13591717
	Filing Date	2012-08-22
	First Named Inventor	Daniel R. Cohn
	Art Unit	3747
	Examiner Name	HUYNH, HAI H
	Attorney Docket Number	11381.113158

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	4993386		1991-02-19	Ozasa et al.	
	2	6990966		2008-01-31	Niimi	
	3	4480816		1984-11-06	Takeda	
	4	3106194		1983-10-08	Cantwell et al.	
	5	4721081		1988-01-26	Krauja et al.	
	6	6508233		2003-01-21	Suhre, B. et al.	
	7	6076487		2000-06-20	Wulff, J. et al.	
	8	6575147		2003-06-10	Wulff, J. et al.	

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	Art Unit	3747	
	Examiner Name	HUYNH, HAI H	
	Attorney Docket Number	11381.113158	

9	6513505		2003-02-04	Watanabe et al.	
10	4541385		1985-09-17	Jessel, A.J.	
11	8799551		2004-10-05	Nakakita et al.	
12	6892691		2005-05-17	Uhl et al.	
13	4958598		1990-09-25	Fosseen, D.	
14	5487744		1996-09-25	Nagaosa et al.	
15	5715788		1998-02-10	Tarr et al.	
16	5883855		1999-11-16	Benedikt et al.	
17	6073807		2000-06-13	Liber, Bruno	
18	6340015		2002-01-22	Benedikt et al.	
19	6536405		2003-03-25	Rieger et al.	

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20	6745744		2004-06-08	Suckewer et al.	
21	6748916		2004-06-15	Rieger et al.	
22	6755175		2004-06-29	McKay et al.	
23	6855154		2005-10-16	Douglas, Denis	
24	7077100		2006-06-19	Vogel et al.	
25	7088376		2006-08-08	McKay, Michael	
26	7201136		2007-04-10	McKay et al.	
27	2741230		1956-04-10	Reynolds, Blake	
28	3557763		1971-01-28	Probst, Stephen C.	
29	4031864		1977-11-01	Crothers, William T.	
30	4058087		1977-11-01	Goyce, Leonard D.	

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31	4230072		1980-10-28	Noguchi et al.	
32	4312310		1982-01-26	Chivito et al.	
33	4402296		1983-09-06	Schwarz, Walter J.	
34	4594201		1986-05-10	Phillips et al.	
35	4967714		1990-11-08	Inoue, Ryuzaburo	
36	4974416		1990-12-04	Taylor, Jack R.	
37	5179923		1993-01-19	Tsuranti et al.	
38	5233944		1993-08-10	Mochizuki, Kenji	
39	5560344		1996-10-01	Chan, Anthony K.	
40	5911210		1999-06-15	Flech, Thomas A.	
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42	6260525		2001-07-17	Moyer, David F.	
43	6267351		2001-09-11	Wulff et al.	
44	6298836		2001-10-09	Huff et al.	
45	6332448		2001-12-25	Iiyama et al.	
46	6358180		2002-03-19	Kuroda et al.	
47	6543423		2003-04-08	Dobryden et al.	
48	6561157		2003-05-13	zur Loye et al.	
49	6622663		2003-09-23	Weisman et al.	
50	6668804		2003-12-30	Dobryden et al.	
51	6725827		2004-04-27	Ueda et al.	
52	6951202		2005-10-04	Oda, Tomihisa	

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	Attorney Docket Number	11381.113158

53	7021277		2006-04-04	Kuo et al.	
54	7107942		2006-09-19	Weissman et al.	
55	7156070		2007-01-02	Strom et al.	
56	7188907		2007-03-13	Kobayashi, Tatsuo	
					duplicated
57	7328362		2008-01-22	Kobayashi, Tatsuo	
					duplicated
58	3089470		1963-05-14	Payne, W.H.	
59	4182278		1980-01-08	Coakwell, Charles A.	
60	7013647		2006-03-21	Auer, Gerhard	

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U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear

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FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ²	Country Code ² (1)	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ³
	1							<input type="checkbox"/>

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NON-PATENT LITERATURE DOCUMENTS							
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.					T ³
	1	A. MODAK and I.S. CARETIO, Engine Cooling by Direct Injection of Cooling Water, Society of Automotive Engineers, Inc.70000?					<input type="checkbox"/>
		no date					
	2	JULIAN A. LoRUSO and HARRY A. CIKANEK, Direct Injection Ignition Assisted Alcohol Engine, Society of Automotive Engineers, Inc. 880495, International Congress and Exposition in Detroit Michigan (February 28-March 4, 1998)					<input type="checkbox"/>
	3	BORJE GRANDIN, HANS-ERIK ANGSTROM, PER STALHAMMAR and ERIC OLOFSSON, Knock Suppression in a Turbocharged SI Engine by Using Cooled EGR, Society of Automotive Engineers, Inc. 982476, International Fall Fuels and Lubricants Meeting and Exposition in San Francisco, California (October 19-22, 1998)					<input type="checkbox"/>
	4	C. STAN, R. TROEGER, S. GUENTHER, A. STANCIU, L. MARTORANO, C. TARANTINO and R. LENSJ, Internal Mixture Formation and Combustion from Gasoline to Ethanol, Society of Automotive Engineers, Inc.2001-01-1207					<input type="checkbox"/>
	5	PCT International Search Report and Written Opinion, Appl. No. PCT/US05/041317, April 8, 2006.					<input type="checkbox"/>
	6	BORJE GRANDIN and HANS-ERIK ANGSTROM, Replacing Fuel Enrichment in a Turbo Charged SI Engine: Lean Burn or Cooled EGR, Society of Automotive Engineers, Inc. 199-01-3505					<input type="checkbox"/>
		no date					
	7	PCT International Search Report and Written Opinion, Appl. No. PCT/US05/012750, June 28, 2007.					<input type="checkbox"/>

/Hai Huynh/ (08/12/2013)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	13591717
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	First Named Inventor	Daniel R. Cohn
	Art Unit	3747
	Examiner Name	HUYNH, HAI H
	Attorney Docket Number	11381.113158

8	USPTO Notice of Allowance, Application No. 11/654100, March 3, 2009.	<input type="checkbox"/>
9	USPTO Non-Final Office Action, Application No. 11/540719, July 11, 2008.	<input type="checkbox"/>
10	J.B. HEYWOOD, "Internal Combustion Engine Fundamentals," McGraw Hill, 1998, page 477.	<input type="checkbox"/>
11	J. STOKES ET AL. "A gasoline engine concept for improved fueleconomy- the lean-boost system," SAE paper 2001-01-2902, pp. 1-12.	<input type="checkbox"/>
12	H.J. CURRAN ET AL., "A comprehensive modeling study of iso-octane oxidation," Combustion and Flame 129:263-269 (2002) pp. 253-280.	<input type="checkbox"/>
13	B. LECOINTE AND G. MONNIER, "Downsizing a gasoline engine using turbocharging with direct injection" SAE paper 2003-01-0542.	<input type="checkbox"/>
14	USPTO Non-Final Office Action, Application No. 10/991774, April 25, 2008	<input type="checkbox"/>
15	USPTO Final Office Action, Application No. 10/991774, September 27, 2008.	<input type="checkbox"/>
16	USPTO Non-Final Office Action, Application No. 10/991774, May 25, 2007.	<input type="checkbox"/>
17	USPTO Non-Final Office Action, Application No. 11/100026, August 3, 2008.	<input type="checkbox"/>
18	FIKRET YUKSEL and BEDRI YUKSEL, "The Use of Ethanol-Gasoline Blend as a Fuel in an SI Engine," Renewable Energy, Vol. 29 (2004) pp. 1181-1191.	<input type="checkbox"/>

/Hai Huynh/ (08/12/2013)

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	Examiner Name	HUYNH, HAI H
	Attorney Docket Number	11381.113158

19	USPTO Non-Final Office Action, Application No. 11/229755, March 22, 2007.	<input type="checkbox"/>
20	USPTO Non-Final Office Action, Application No. 11/229755, October 4, 2007.	<input type="checkbox"/>
21	USPTO Non-Final Office Action, Application No. 11/692372, January 2, 2008.	<input type="checkbox"/>
22	USPTO Final Office Action, Application No. 11/692372, October 17, 2008.	<input type="checkbox"/>
23	USPTO Non-Final Office Action, Application No. 11/684100, June 3, 2008.	<input type="checkbox"/>
24	PCT International Search Report and Written Opinion, Application No. PCT/1807/03004, July 9, 2008.	<input type="checkbox"/>
25	PCT international Search Report and Written Opinion, Application No. PCT/US07/05777, March 24, 2008.	<input type="checkbox"/>
26	PCT International Search Report and Written Opinion, Application No. PCT/US07/74227, February 25, 2008.	<input type="checkbox"/>
27	PCT International Search Report and Written Opinion, Application No. PCT/US08/99171, October 3, 2008.	<input type="checkbox"/>

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/Hai Huynh/ (08/12/2013)	Date Considered
--------------------	--------------------------	-----------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
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Art Unit	3747
Examiner Name	HUYNH, HAI H
Attorney Docket Number	11381.113158

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.18 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	13591717
	Filing Date	2012-06-22
	First Named Inventor	Daniel R. Cohn
	Art Unit	3747
	Examiner Name	HUYNH, HAI H
	Attorney Docket Number	11381.113158

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).


OR

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).


- See attached certification statement.
- The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.


Signature		Date (YYYY-MM-DD)	2012-12-10
Name/Print	Sam Pasternack	Registration Number	29576

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Issue Classification 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747


US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION									
CLASS			SUBCLASS			CLAIMED				NON-CLAIMED					
123			1A			F	0	2	M	25 / 14 (2006.01.01)					
CROSS REFERENCE(S)															
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)														
123	431	198A													

NONE			Total Claims Allowed:	
			5	
(Assistant Examiner)		(Date)	O.G. Print Claim(s)	O.G. Print Figure
/HAI HUYNH/ Primary Examiner. Art Unit 3747		08/12/13	1	2
(Primary Examiner)		(Date)		

Issue Classification 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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	2		18		34										
	3		19		35										
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	12		28		44										
	13		29		45										
	14		30												
	15		31												
	16		32												


NONE		Total Claims Allowed:	
		5	
(Assistant Examiner)	(Date)	O.G. Print Claim(s)	O.G. Print Figure
/HAI HUYNH/ Primary Examiner. Art Unit 3747	08/12/13	1	2
(Primary Examiner)	(Date)		

<i>Index of Claims</i> 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claims renumbered in the same order as presented by applicant
 CPA
 T.D.
 R.1.47

CLAIM		DATE							
Final	Original	11/07/2012	02/20/2013	08/12/2013					
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	34	-	-	-					
	35	-	-	-					
	36	-	-	-					

<i>Index of Claims</i> 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant		<input type="checkbox"/> CPA			<input type="checkbox"/> T.D.			<input type="checkbox"/> R.1.47		
CLAIM		DATE								
Final	Original	11/07/2012	02/20/2013	08/12/2013						
	37	-	-	-						
1	38	✓	✓	=						
2	39	✓	✓	=						
3	40	✓	✓	=						
4	41	✓	✓	=						
5	42	✓	✓	=						
	43	✓	-	-						
	44	✓	-	-						
	45	✓	-	-						




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BIB DATA SHEET

CONFIRMATION NO. 8123

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
13/591,717	08/22/2012	123	3747	11381.113158		
APPLICANTS Daniel R. Cohn, Cambridge, MA; Leslie Bromberg, Sharon, MA; John B. Heywood, Newtonville, MA;						
** CONTINUING DATA ***** This application is a CON of 13/410,373 03/02/2012 PAT 8276565 and is a CON of 13/282,787 10/27/2011 PAT 8146568 * and is a CON of 13/117,448 05/27/2011 PAT 8069839 * and is a CON of 12/815,842 06/15/2010 PAT 7971572 and is a CON of 12/329,729 12/08/2008 PAT 7762233 and is a CON of 11/840,719 08/17/2007 PAT 7740004 and is a CON of 10/991,774 11/18/2004 PAT 7314033 (*)Data provided by applicant is not consistent with PTO records.						
** FOREIGN APPLICATIONS *****						
** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 08/31/2012						
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and Acknowledged <u>/HAI H HUYNH/</u> Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	STATE OR COUNTRY MA	SHEETS DRAWINGS 3	TOTAL CLAIMS 5	INDEPENDENT CLAIMS 2
ADDRESS MIT's Technology Licensing Office One Cambridge Center Kendall Square, NE 18-501 Cambridge, MA 02142-1493 UNITED STATES						
TITLE FUEL MANAGEMENT SYSTEM FOR VARIABLE ETHANOL OCTANE ENHANCEMENT OF GASOLINE ENGINES						
FILING FEE RECEIVED 1250	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit			

Search Notes 	Application/Control No. 13591717	Applicant(s)/Patent Under Reexamination COHN ET AL.
	Examiner HAI HUYNH	Art Unit 3747

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
123	1A,198A, 299, 300, 304, 305, 575, 431, 436, 27GE, 525	11/7/2012	HHH
update	search	8/12/2013	HHH

SEARCH NOTES		
Search Notes	Date	Examiner
East	11/7/2012	HHH
	8/12/2013	HHH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
above	search	11/7/2012	HHH
		8/12/2013	HHH

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Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
13/591,717 08/22/2012 Daniel R. Cohn 11381.113158 8123
7590 12/11/2013 MIT's Technology Licensing Office
EXAMINER HUYNH, HAI H
ART UNIT PAPER NUMBER 3747
NOTIFICATION DATE DELIVERY MODE 12/11/2013 ELECTRONIC

Notice of Abandonment

This application is abandoned in view of:

- 1. [] The applicant's failure to timely file a proper reply to the Office letter mailed on _____.
(a) [] A reply was received on _____ (with a Certificate of Mailing or Transmission date _____), which is after the expiration of the period for reply...
(b) [] No reply has been received.
2. [X] Applicant's failure to timely pay the required issue fee and publication fee...
(a) [] The issue fee and publication fee, if applicable, was received on _____.
(b) [] The submitted fee of \$_____ is insufficient. A balance of \$_____ is due.
(c) [X] The issue fee and publication fee, if applicable, has not been received.
3. [] Applicant's failure to timely file corrected drawings...
(a) [] Proposed corrected drawings were received on _____.
(b) [] No corrected drawing have been received.
4. [] Applicant's failure to timely file the inventor's oath or declaration...
(a) [] An inventor's oath or declaration was received on _____.
(b) [] While an oath or declaration (or substitute statement) for one or more inventors was received...
(c) [] No inventor's oath or declaration has been received.
5. [] Drawings received on _____ were disapproved by examiner.
6. [] Corrected drawings were received on _____, which is after the expiration of the one-month period...
7. [] No corrected drawings have been received in reply to one-month period...
8. [] The reason(s) below:

Petitions to revive under 37 CFR 1.137(a) or (b), or request to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

Almog Ball

(571)-272-4200 or 1(888)-786-0101
Patent Publication Branch
Office of Data Management

FORM PTO-ABN0 (Rev. 06/09)