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ISSUE DATE: *July 9, 2019*

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PTO/AIA/50 (03-13)
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REISSUE PATENT APPLICATION TRANSMITTAL

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Attorney Docket No.	PET744/4-001REUS/58000
First Named Inventor	Frank Petrosino
Original Patent Number	8,236,145
Original Patent Issue Date (Month/Day/Year)	August 7, 2012
Express Mail Label No.	Electronically Filed

APPLICATION FORREISSUE OF: (*Check applicable box*) ☑ Utility Patent ☐ Design Patent ☐ Plant Patent

APPLICATION ELEMENTS (37 CFR 1.173)

1. ☐ **Fee Transmittal Form** (PTO/SB/56)
2. ☐ **Applicant asserts small entity status.** See 37 CFR 1.27
3. ☑ **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. ☑ **Specification and Claims** in double column copy of patent format (*amended, if appropriate*)
5. ☑ **Drawing(s)** (*proposed amendments, if appropriate*)
6. ☐ **Reissue Oath/Declaration or Substitute Statement** (37 CFR 1.175) (PTO/AIA/05, 06, or 07)
7. ☑ **Application Data Sheet** **NOTE:** Benefit claims under 37 CFR 1.78 and foreign priority claims under 37 CFR 1.55 MUST be set forth in an Application Data Sheet (ADS).
8. ☐ **Original U.S. Patent currently assigned?** ☐ Yes ☑ No (*If Yes, check applicable box(es)*)
   - ☐ Written Consent of all Assignees (PTO/AIA/53)
   - ☐ 37 CFR 3.73(c) Statement (PTO/AIA/96)
9. ☐ **CD-ROM or CD-R** in duplicate, Computer Program (*Appendix*) or large table
   - ☐ Landscape Table on CD
10. **Nucleotide and/or Amino Acid Sequence Submission** (*if applicable, items a. – c. are required*)
    - a. ☐ Computer Readable Form (CRF)
    - b. ☐ Specification Sequence Listing on:
      - i. ☐ CD-ROM (2 copies) or CD-R (2 copies); **or**
      - ii. ☐ Paper
    - c. ☐ Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

11. ☐ **Statement of status and support for all changes to the claims.** See 37 CFR 1.173(c).
12. ☐ **Power of Attorney**
13. ☐ **Information Disclosure Statement (IDS)** PTOSB/08 or PTO-1449
    - ☐ Copies of citations attached
14. ☐ **English translation of Reissue Oath/Declaration** (*if applicable*)
16. ☐ **Return Receipt Postcard** (MPEP § 503) (Should be specifically itemized)
17. ☑ **Other:** Preliminary Amendment

☐ This is a continuation reissue or divisional reissue application (*i.e.*, a second or subsequent reissue application for the same issued patent). (*Check box if applicable.*)

18. CORRESPONDENCE ADDRESS

☑ The address associated with Customer Number: 21586 **OR** ☐ Correspondence address below

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Address					
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Country		Telephone			
Email					

Signature	/Timothy S. Corder/	Date	2014-08-05
Name (Print/Type)	Timothy S. Corder	Registration No.	38,414

This collection of information is required by 37 CFR 1.173. 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: Mail Stop Reissue, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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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.
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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.
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Doc Code: MES.GIB
Document Description: Certification of Micro Entity Status (Gross Income Basis)

PTO/SB/15A (07-14)

CERTIFICATION OF MICRO ENTITY STATUS
(GROSS INCOME BASIS)

Application Number or Control Number (if applicable):	Patent Number (if applicable):
First Named Inventor: Frank Petrosino	Title of Invention: Electrolysis Prevention Device and Method of Use

The applicant hereby certifies the following—

(1) **SMALL ENTITY REQUIREMENT –** The applicant qualifies as a small entity as defined in 37 CFR 1.27.

(2) **APPLICATION FILING LIMIT –** Neither the applicant nor the inventor nor a joint inventor has been named as the inventor or a joint inventor on more than four previously filed U.S. patent applications, excluding provisional applications and international applications under the Patent Cooperation Treaty (PCT) for which the basic national fee under 37 CFR 1.492(a) was not paid, and also excluding patent applications for which the applicant has assigned all ownership rights, or is obligated to assign all ownership rights, as a result of the applicant's previous employment.

(3) **GROSS INCOME LIMIT ON APPLICANTS AND INVENTORS –** Neither the applicant nor the inventor nor a joint inventor, in the calendar year preceding the calendar year in which the applicable fee is being paid, had a gross income, as defined in section 61(a) of the Internal Revenue Code of 1986 (26 U.S.C. 61(a)), exceeding the "Maximum Qualifying Gross Income" reported on the USPTO Web site at http://www.uspto.gov/patents/law/micro_entity.jsp which is equal to three times the median household income for that preceding calendar year, as most recently reported by the Bureau of the Census.

(4) **GROSS INCOME LIMIT ON PARTIES WITH AN "OWNERSHIP INTEREST" –** Neither the applicant nor the inventor nor a joint inventor has assigned, granted, or conveyed, nor is under an obligation by contract or law to assign, grant, or convey, a license or other ownership interest in the application concerned to an entity that, in the calendar year preceding the calendar year in which the applicable fee is being paid, had a gross income, as defined in section 61(a) of the Internal Revenue Code of 1986, exceeding the "Maximum Qualifying Gross Income" reported on the USPTO Web site at http://www.uspto.gov/patents/law/micro_entity.jsp which is equal to three times the median household income for that preceding calendar year, as most recently reported by the Bureau of the Census.

SIGNATURE by an authorized party set forth in 37 CFR 1.33(b)

Signature	/Timothy S. Corder/				
Name	Timothy S. Corder				
Date	08/05/14	Telephone	512.542.8446	Registration No.	38,414

☐ There is more than one inventor and I am one of the inventors who are jointly identified as the applicant. The required additional certification form(s) signed by the other joint inventor(s) are included with this form.

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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.

US008236145B2

(12) **United States Patent**
Petrosino

(10) **Patent No.: US 8,236,145 B2**
(45) **Date of Patent: Aug. 7, 2012**

(54) **ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE**

(76) Inventor: **Frank Petrosino**, Concord, NC (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 228 days.

(21) Appl. No.: **12/631,903**

(22) Filed: **Dec. 7, 2009**

(65) **Prior Publication Data**

US 2010/0140082 A1 Jun. 10, 2010

Related U.S. Application Data

(60) Provisional application No. 61/120,296, filed on Dec. 5, 2008.

(51) **Int. Cl.**
C23F 13/10 (2006.01)
C23F 13/18 (2006.01)

(52) **U.S. Cl.** **204/196.37**; 204/196.1; 204/196.17; 204/196.18; 204/196.19; 204/196.21; 204/196.23; 204/196.24; 204/196.25; 204/196.3; 204/196.36; 204/196.15; 204/196.2; 205/730; 205/732, 205/733; 205/740

(58) **Field of Classification Search** 204/196.1, 204/196.17, 196.18, 196.19, 196.21, 196.23, 204/196.24, 196.25, 196.3, 196.31, 196.36, 204/196.37, 205/730, 732, 733, 740
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,775,392 A * 10/1988 Loyd 204/196.16
5,649,591 A * 7/1997 Green 165/134.1

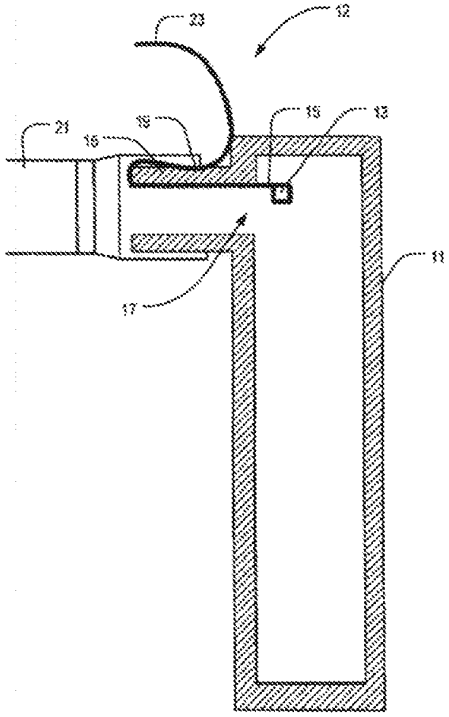
* cited by examiner

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(57) **ABSTRACT**

An electrolysis prevention device, for preventing corrosion caused by electrolysis, includes a sacrificial anode made of an active metal and an anode holder supporting the sacrificial anode. The holder is adapted to fit around the inlet connection of an engine heat exchange component, such as a radiator or heater core, in such a way as to allow for a hose to be attached overtop the device. The device may be included in an originally-manufactured engine heat exchange component or may be installed later

14 Claims, 27 Drawing Sheets



ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE

CROSS-REFERENCE TO RELATED APPLICATION

The present application is a U.S. nonprovisional patent application of, and claims priority under 35 U.S.C. §119(e) to, U.S. provisional patent application Ser. No. 61/120,296, filed Dec. 5, 2008, which provisional patent application is incorporated by reference herein.

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BACKGROUND OF THE PRESENT INVENTION

1. Field of the Present Invention

This application relates generally to motor vehicles, whether powered by gas, diesel, electric battery, propane, natural gas, or any other like material, and in particular to radiators and engines and preventing corrosion in the cooling system of said vehicles, especially those with components of dissimilar metal construction which present most cooling system corrosion problems.

2. Background

Automobile cooling systems circulate water and coolant liquids through an engine's water jacket, head, and water pump to facilitate heat transfer. After absorbing the heat, the hot liquid is piped back to the radiator/storage tank which is a liquid to air heat exchanger. A typical radiator is made up of a storage tank either above or to the side of the cooling tubes and exchanged cooling fins. This storage tank has an opening to the interior of the storage tank part, a core of cooling tubes, which is where the coolant liquid flows, and fins, connected to these cooling tubes, which transfer heat to the air that is pulled or pushed through the fins and around the tubes for heat transfer from the coolant to the air passing through.

Radiators and engines were historically made of iron, steel, copper, and/or brass, which, as similar metals, have little corrosion caused by electrolytic activity. Over time, however, aluminum parts have been incorporated into engine thermal control devices, such as radiators and heater cores. While the use of aluminum offers several advantages, an unfortunate side effect of using dissimilar metals is an increase in electrolytic activity, leading to increased vulnerability to corrosion. In response to the electrolytic activity, also known as electrolysis, aluminum components corrode and become porous and may begin to leak in as little as two weeks.

During electrolysis, one of the metals in the system acts as an anode and corrodes. The other metal acts as a cathode and does not corrode. Chemical corrosion inhibitors have been developed to inhibit electrolysis, but they are toxic, present problems to the environment, and present problems of disposal. Alternatively, sacrificial anodes, constructed of active metals, that is metals that react with oxygen, such as magnesium, aluminum, zinc or combinations thereof, have also been used as corrosion inhibitors. Sacrificial anodes do not eliminate the flow of electric current, but instead attract the electric current, acting as a "lightning rod" that electricity

clings to, thus relieving the anodic metal of the thermal control device from the corrosive damage of electrolysis.

U.S. Pat. No. 5,292,593 describes a sacrificial anode of specified composition bonded to the core metal to prevent the occurrence of pitting corrosion of core material in a heat exchanger such as a radiator or heater core. Unfortunately such an anode is hard to access to check its condition or replace it when it wears out. A need exists for a corrosion-inhibiting sacrificial anode which is easily accessible. Since a sacrificial anode is designed to be consumed, easy accessibility would allow verification of its effective working status and efficient replacement when depleted.

Furthermore, prior attempts at preventing corrosion in heat exchangers have failed due to the sacrificial anode being installed in undesirable locations. U.S. Pat. No. 5,649,591 describes a sacrificial anode built into a radiator cap. Such a solution is imperfect because some radiators lack caps and, for those that do have caps, the position of the cap is too far from the inlet to effectively prevent corrosion from occurring.

Thus, a need continues to exist to prevent corrosion in radiators and other engine thermal control devices. Current sacrificial anode devices are deficient in that they fail to position the anode optimally to allow for maximal corrosion resistance and easy monitoring, removal, and replacement.

SUMMARY OF THE PRESENT INVENTION

In accordance with a preferred embodiment, the present invention comprises a device to prevent corrosion caused by electrolysis comprised of metal, preferably disposed in or near the inlet hose connection of a radiator, heater core, or other such engine thermal control device.

In features of this aspect, the corrosion prevention device is a sacrificial anode comprised of an active metal such as aluminum, magnesium, or zinc. In some preferred embodiments, the sacrificial anode is clipped to the inner wall of the radiator inlet. In different embodiments, the anode will hang at various distances from the upper lip of the radiator inlet. In other preferred embodiments, the sacrificial anode is constructed into the wall of the radiator near the inlet or built as a plug that may be inserted into a radiator plug opening.

Broadly defined, the present invention according to one aspect is an electrolysis prevention device, for preventing corrosion caused by electrolysis, including: a sacrificial anode made of an active metal; and an anode holder supporting the sacrificial anode; wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

In features of this aspect, the sacrificial anode is made of aluminum; the sacrificial anode is made of magnesium; the sacrificial anode is made of zinc; the anode holder is grounded to the vehicle; an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of the liquid coolant; the anode holder is connected to the radiator by a clamp; the engine heat exchange component is a radiator; and/or the engine heat exchange component is a heater core.

In another aspect, the present invention is a radiator with an internal sacrificial anode in proximity to an inlet connection thereof.

In yet another aspect, the present invention is a heater core with an internal sacrificial anode in proximity to an inlet connection thereof.

In still another aspect, the present invention is a method of preventing corrosion of an engine heat exchange component

comprising adding or installing a sacrificial anode assembly within the heat exchange component adjacent an inlet thereof.

In a feature of this aspect, the engine heat exchange component has an inlet connection, and the method further includes: installing a fitting hole into the tank of the engine heat exchange component adjacent the inlet connection; and filling said fitting hole with a sacrificial anode of the sacrificial anode assembly. In another feature of this aspect, the method further includes attaching the sacrificial anode to the engine heat exchange component within 10 inches of a center of the inlet connection. In a further feature, the method further includes comprising grounding the sacrificial anode by means of an attached ground wire. In a still further feature, the attached ground wire is a "pigtail" clip connecting the sacrificial anode to a wiring harness.

In yet another aspect, the present invention is an electrolysis prevention shield for preventing corrosion caused by electrolysis. The electrolysis prevention shield includes a sheathing of durable insulating material wherein the sheathing of durable insulating material is configured to affix to a protrusion of metal. In a feature of this aspect, the durable insulating material is rubber. In an alternative feature, the durable insulating material is plastic.

Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood that the detailed description and specific examples, while indicating the preferred embodiment of the invention, are intended for purposes of illustration only and are not intended to limit the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Further features, embodiments, and advantages of the present invention will become apparent from the following detailed description with reference to the drawings, wherein:

FIG. 1A is a left side cross-sectional view of a radiator having an electrolysis prevention device in accordance with a first preferred embodiment of the present invention;

FIG. 1B is a front schematic view of a crossflow radiator having an electrolysis prevention device arranged as shown in FIG. 1A;

FIG. 1C is a from schematic view of a downflow radiator having an electrolysis prevention device arranged as shown in FIG. 1A;

FIG. 2A is a left side cross-sectional view of a radiator having an electrolysis prevention device in accordance with a second preferred embodiment of the present invention;

FIG. 2B is a front schematic view of a crossflow radiator having an electrolysis prevention device arranged as shown in FIG. 2A;

FIG. 2C is a front schematic view of a downflow radiator having an electrolysis prevention device arranged as shown in FIG. 2A;

FIG. 3A is a left side cross-sectional view of a radiator having an electrolysis prevention device in accordance with a third preferred embodiment of the present invention;

FIG. 3B is a front schematic view of a crossflow radiator having an electrolysis prevention device arranged as shown in FIG. 3A;

FIG. 3C is a front schematic view of a downflow radiator having an electrolysis prevention device arranged as shown in FIG. 3A;

FIG. 3D is a front cross-sectional view of the inlet connection of FIG. 3A, taken along line 3D-3D and focusing on the inlet and inlet connection;

FIG. 4A is a left side cross-sectional view of a radiator having an electrolysis prevention device in accordance with a fourth preferred embodiment of the present invention;

FIG. 4B is a front schematic view of a crossflow radiator having an electrolysis prevention device arranged as shown in FIG. 4A;

FIG. 4C is a front schematic view of a downflow radiator having an electrolysis prevention device arranged as shown in FIG. 4A;

FIG. 5A is a left side cross-sectional view of a radiator illustrating various locations for a removable plug that may be replaced with an electrolysis prevention device in accordance with a sixth preferred embodiment of the present invention;

FIG. 5B is a front schematic view of a crossflow radiator illustrating various locations for a removable plug that may be replaced with an electrolysis prevention device;

FIG. 5C is a front schematic view of a downflow radiator illustrating various locations for a removable plug that may be replaced with an electrolysis prevention device;

FIG. 6A is a left side cross-sectional view of the radiator of FIG. 5A, shown with an electrolysis prevention device installed in place of the removable plug;

FIG. 6B is a front schematic view of the crossflow radiator of FIG. 5B, shown with an electrolysis prevention device installed in place of the removable plug;

FIG. 6C is a front schematic view of the downflow radiator of FIG. 5C, shown with an electrolysis prevention device installed in place of the removable plug;

FIG. 7A is a side view of an electrolysis prevention device for use in the radiators of FIGS. 5A-5C;

FIG. 7B is a side view of the electrolysis prevention device of FIG. 7A;

FIG. 7C is a side view of another electrolysis prevention device for use in the radiators of FIGS. 5A-5C;

FIG. 8A is a side schematic view of an electrolysis prevention device arranged at a 90-degree angle for easy access;

FIG. 8B is a side schematic view of an electrolysis prevention device arranged at a 45-degree angle for easy access;

FIG. 9A is a side schematic of a heater core having an electrolysis prevention device in accordance with a sixth preferred embodiment of the present invention;

FIG. 9B is an enlarged view of a portion of the inlet hose and inlet pipe of the heater core of FIG. 9A but with an alternative electrolysis prevention device installed therein in accordance with a seventh preferred embodiment of the present invention.

FIG. 10A is a front schematic view of a downflow radiator having an electrolysis prevention shield in accordance with a seventh preferred embodiment of the present invention;

FIG. 10B is an enlarged fragmentary front schematic view of a portion of the radiator of FIG. 10A, detailing a mounting peg covered by the electrolysis prevention shield;

FIG. 10C is an enlarged fragmentary top schematic view of the portion of the radiator of FIG. 10A;

FIG. 10D is a front cross-sectional view of the portion of the radiator shown in FIG. 10C, taken along line 10-10;

FIG. 11A is a side view of an electrolysis prevention device for use in the radiators of FIGS. 5A-5C;

FIG. 11B is a top cross-sectional view of the electrolysis prevention device of FIG. 11A, taken along line 11-11; and

FIG. 11C is a side schematic view of the electrolysis prevention device of FIG. 11A, shown installed in a radiator.

DETAILED DESCRIPTION

As a preliminary matter, it will readily be understood by one having ordinary skill in the relevant art ("Ordinary Arti-

san") that the present invention has broad utility and application. Furthermore, any embodiment discussed and identified as being "preferred" is considered to be part of a best mode contemplated for carrying out the present invention. Other embodiments also may be discussed for additional illustrative purposes in providing a full and enabling disclosure of the present invention. Moreover, many embodiments, such as adaptations, variations, modifications, and equivalent arrangements, will be implicitly disclosed by the embodiments described herein and fall within the scope of the present invention.

Accordingly, while the present invention is described herein in detail in relation to one or more embodiments, it is to be understood that this disclosure is illustrative and exemplary of the present invention, and is made merely for the purposes of providing a full and enabling disclosure of the present invention. The detailed disclosure herein of one or more embodiments is not intended, nor is to be construed, to limit the scope of patent protection afforded the present invention, which scope is to be defined by the claims and the equivalents thereof. It is not intended that the scope of patent protection afforded the present invention be defined by reading into any claim a limitation found herein that does not explicitly appear in the claim itself.

Thus, for example, any sequence(s) and/or temporal order of steps of various processes or methods that are described herein are illustrative and not restrictive. Accordingly, it should be understood that, although steps of various processes or methods may be shown and described as being in a sequence or temporal order, the steps of any such processes or methods are not limited to being carried out in any particular sequence or order, absent an indication otherwise. Indeed, the steps in such processes or methods generally may be carried out in various different sequences and orders while still falling within the scope of the present invention. Accordingly, it is intended that the scope of patent protection afforded the present invention is to be defined by the appended claims rather than the description set forth herein.

Additionally, it is important to note that each term used herein refers to that which the Ordinary Artisan would understand such term to mean based on the contextual use of such term herein. To the extent that the meaning of a term used herein—as understood by the Ordinary Artisan based on the contextual use of such term—differs in any way from any particular dictionary definition of such term, it is intended that the meaning of the term as understood by the Ordinary Artisan should prevail.

Furthermore, it is important to note that, as used herein, "a" and "an" each generally denotes "at least one," but does not exclude a plurality unless the contextual use dictates otherwise. Thus, reference to "a picnic basket having an apple" describes "a picnic basket having at least one apple" as well as "a picnic basket having apples." In contrast, reference to "a picnic basket having a single apple" describes "a picnic basket having only one apple."

When used herein to join a list of items, "or" denotes "at least one of the items," but does not exclude a plurality of items of the list. Thus, reference to "a picnic basket having cheese or crackers" describes "a picnic basket having cheese without crackers," "a picnic basket having crackers without cheese," and "a picnic basket having both cheese and crackers." Finally, when used herein to join a list of items, "and" denotes "all of the items of the list." Thus, reference to "a picnic basket having cheese and crackers" describes "a picnic basket having cheese, wherein the picnic basket further has crackers," as well as describes "a picnic basket having crackers, wherein the picnic basket further has cheese."

As used herein, an "engine heat exchange component" refers to an engine radiator, heater core, or other device for exchanging heat in an engine.

Referring now to the drawings, in which like numerals represent like components throughout the several views, the preferred embodiments of the present invention are next described. The following description of one or more preferred embodiment(s) is merely exemplary in nature and is in no way intended to limit the invention, its application, or uses.

FIG. **1A** is a left side cross-sectional view of a radiator **11** having an electrolysis prevention device **12** in accordance with a first preferred embodiment of the present invention. As shown therein, an electrolysis prevention device **12** includes a sacrificial anode **13** supported at the end of a sleeve wire, metal slide, clip **15** or the like such that the anode is disposed adjacent the radiator inlet **17**. The anode **13** should be comprised of a metal that reacts strongly with oxygen, also known as an active metal, such as magnesium, aluminum, zinc or combinations thereof. The anode support **19** extends through and out the radiator inlet and is doubled back around the inlet fitting **16**. The radiator hose **21** slides over the inlet fitting **16** and is clamped in place. The exposed end **23** of the anode support **19** optionally may be connected via ground wire (not shown) to the wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like. However, grounding of the anode is not a necessary aspect of this embodiment, or any embodiment, of the present invention.

Such an assembly **12** can be installed very quickly and can be used in radiators having plastic tanks as well as in radiators having aluminum tanks Furthermore, a smaller version may be utilized with heater cores (not shown). The radiators **11** can be of any conventional type, including the "crossflow" type, meaning the tanks **33** are on the sides (see FIG. **1B**), the "downflow" type, meaning the tanks **33** are on top or bottom (see FIG. **1C**), the "double pass" type, meaning that both connections (inlet and outlet) are on one side of the radiator (not shown), or the like. A similar assembly, appropriately adjusted in size, shape or the like, may likewise be utilized in heater cores (not shown). In each of these cases, the sacrificial anode **13** according to this embodiment is preferably disposed in the inlet hose connection of the radiator or heater core. Thus, this arrangement may be particularly useful as a "drop in" for aftermarket—i.e., for radiators and heater cores that are already produced or in service in vehicles already on the road.

FIG. **1B** is a front schematic view of a crossflow radiator **11** having an electrolysis prevention device arranged as shown in FIG. **1A**, while FIG. **1C** is a front schematic view of a downflow radiator **11** having an electrolysis prevention device **12** arranged as shown in FIG. **1A**. A typical radiator includes an aluminum core **31** and either plastic or all-aluminum tanks **33**. The specific inlet connection **16** varies by vehicle make, model and model year, but the inlet **17** is generally understood to refer to the vicinity of where hot water coming directly from the engine enters into the radiator **11**. The radiator **11** may include a fill cap **39** as shown in FIG. **1C** but is understood to be optional and is not present on many radiators **39**. Further, at least some radiators have a coolant reservoir.

Both downflow and crossflow radiators typically have a petcock **25** for draining fluid from the radiator, an outlet **27**, core fins and tubes **29**, and may optionally have a transmission and engine oil cooler/heater connection **35** and temperature sensor **37**.

FIG. **2A** is a left side cross-sectional view of a radiator **11** having an electrolysis prevention device **112** in accordance with a second preferred embodiment of the present invention. The electrolysis prevention device **112** in this embodiment is

generally similar to that of FIG. **1**A, but the anode **13** itself hangs further down below the center axis of the radiator inlet **17** so as to be placed slightly lower into the flow of the water, coolant, or antifreeze. FIG. **2**B is a front schematic view of a crossflow radiator **11** having an electrolysis prevention device **112** arranged as shown in FIG. **2**A; and FIG. **2**C is a front schematic view of a downflow radiator **11** having an electrolysis prevention device **112** arranged as shown in FIG. **2**A. As with previous embodiments, the device **112** optionally may or may not be connected via ground wire to the wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like.

FIG. **3**A is a left side cross-sectional view of a radiator **11** having an electrolysis prevention device **212** in accordance with a third preferred embodiment of the present invention; FIG. **3**B is a front schematic view of a crossflow radiator **11** having a sacrificial anode arranged as shown in FIG. **3**A; and FIG. **3**C is a front schematic view of a downflow radiator **11** having an electrolysis prevention device **212** arranged as shown in FIG. **3**A. FIG. **3**D is a front cross-sectional view of the inlet connection of FIG. **3**A, taken along line **3**D-**3**D and focusing on the inlet **17** and inlet connection **16**. In this preferred embodiment, the sacrificial anode **13** and support **19** are held in place with a clamp **41**. As with previous embodiments, the device **212** optionally may or may not be connected via ground wire to the wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like.

FIG. **4**A is a left side cross-sectional view of a radiator having an electrolysis prevention device **312** in accordance with a fourth preferred embodiment of the present invention; FIG. **4**B is a front schematic view of a crossflow radiator having an electrolysis prevention device arranged as shown in FIG. **4**A; and FIG. **4**C is a front schematic view of a downflow radiator having an electrolysis prevention device arranged as shown in FIG. **4**A. In this embodiment, the electrolysis prevention device **312** is built into the radiator **11** when the radiator **11** is manufactured. The device **12** may be attached to the interior of the radiator **11** at any of a variety of locations **44** in the vicinity of the inlet **17**. In particular, this allows for an anode **13** to be attached by any way imaginable within **10** inches in any direction of the center axis of the inlet connection **16**. Preferably, attachment is to the aluminum tank **33** or the aluminum core **31** via weld **42**, but other attachment means and connection points may alternatively be used. As with previous embodiments, the device **312** optionally may or may not be connected via ground wire to the wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like.

FIG. **5**A is a left side cross-sectional view of a radiator illustrating various locations for a removable plug **43** that may be replaced with an electrolysis prevention device **412** in accordance with a fifth preferred embodiment of the present invention; FIG. **5**B is a front schematic view of a crossflow radiator illustrating various locations for a removable plug **43** that may be replaced with an electrolysis prevention device; and FIG. **5**C is a front schematic view of a downflow radiator illustrating various locations for a removable plug **43** that may be replaced with an electrolysis prevention device **412**. In at least one preferred embodiment, the removable plug may be a threaded pipe plug with a ¾ pipe thread. It will be appreciated that although one plug **43** is illustrated, there are other locations **44** where the plug **43** can alternatively be installed. Regardless of where the plug **43** is located, it is installed at time of manufacture (or optionally replaced during a subsequent repair procedure) but can be removed and replaced with an electrolysis prevention device such as one of the devices **412**,**512** shown in FIGS. **7**A-**7**C. In this regard, FIG. **6**A is a left side cross-sectional view of the radiator of FIG. **5**A, shown with an electrolysis prevention device **412** installed in place of the removable plug **43**; FIG. **6**B is a front schematic view of the crossflow radiator of FIG. **5**B, shown with an electrolysis prevention device **412** installed in place of the removable plug **43**; and FIG. **6**C is a front schematic view of the downflow radiator of FIG. **5**C, shown with an electrolysis prevention device **412** installed in place of the removable plug **43**.

Notably, in some embodiments, the radiator manufacturer provides the hole and the plug **43** for the hole, and the electrolysis prevention device **412** is installed by a mechanic in an after-market process, while in other embodiments, the radiator manufacturer installs the electrolysis prevention device **412** at time of manufacture.

FIG. **7**A is a side view of the electrolysis prevention device **412** of FIGS. **6**A-**6**C, comprising the sacrificial anode **13** and an anode holder **45** with a "pigtail" connector **47** into which the anode attaches. The "pigtail" connector **47** grounds the device **12** by attaching it to the vehicle's wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like, via grounding wire **48**. As with previous embodiments, however, the device **412** optionally may or may not be grounded in this manner. FIG. **7**B is a side view of an electrolysis prevention device shown in FIG. **7**A wherein the anode **13** is attached into the anode holder **45** inserted in a hole in the wall of the radiator **11**. An o-ring **49** is also installed to protect against leaking. FIG. **7**C is a side view of another electrolysis prevention device **512** for use in the radiators **11** of FIGS. **5**A-**5**C, wherein a rubber seal **51** is utilized to hold the anode **13** in place in the hole of the radiator **11**.

FIGS. **11**A-**11**C illustrate an alternative electrolysis prevention device **1112** for use in radiators **11** of FIGS. **5**A-**5**C. FIG. **11**A is a side view of the electrolysis prevention device **1112**, comprising a sacrificial anode **13** and an partially threaded anode holder **45** with a "pigtail" connector **47** into which the anode attaches. The sacrificial anode **13** is affixed to an anode support **19** which extends from one end of the anode holder **45**. The "pigtail" connector **47** grounds the device **1112** by attaching it to the vehicle's wiring harness, a suitable grounded location on the frame, or cross member of the vehicle, or the like, via grounding wire **48**. As with previous embodiments, however, the device **1112** optionally may or may not be grounded in this manner.

FIG. **11**B is a cross-sectional view of the electrolysis prevention device **1112** shown in FIG. **11**A. As shown therein, the anode support **19** extends through the interior of the anode holder **45**, and is separated from the holder **45** by an insulating material **90**. Furthermore, in at least one preferred embodiment, the anode holder **45** has a small opening into which the ground wire **48** can extend, and thus be in electrical connection with the anode support **19**, grounding the device **1112**.

FIG. **11**C is a side view of the electrolysis prevention device **1112** of FIGS. **11**A-**11**B, wherein the device **1112** has been installed in a hole in a wall of a radiator **11**. An o-ring **49** is also installed on each side to seal the opening, thereby protecting against leakage. It will be appreciated that the dashed lines in FIG. **11**C illustrate where the anode holder passes through the radiator wall. The device **1112** is secured to the wall of the radiator **11** with a threaded nut **92** that has been screwed into the threaded end of the anode holder **45** such that the radiator wall is clamped between the threaded nut **92** and a flange on the anode holder **45**.

FIGS. **8**A and **8**B are side schematic views of two electrolysis prevention devices arranged at different angles to

promote easy access. The first drawing depicts an electrolysis prevention device **612** arranged at a 90-degree angle. The second depiction is of an electrolysis prevention device **712** arranged at a 45-degree angle.

It will be appreciated that the various teachings described and illustrated herein may likewise be applied to protect a heater core from corrosion in a similar fashion. In this regard, it will be further appreciated that, because of their generally smaller size, heater cores may require the use of a sacrificial anode of different dimensions, and in particular may require the use of a thinner or slimmer anode and, in at least some cases, produce a correspondingly slimmer electrolysis prevention device. The change in dimension may be necessary to prevent damage to the heater core when mounted therein. FIG. **9A** is a side schematic of a heater core **811** having an electrolysis prevention device **812** in accordance with a sixth preferred embodiment of the present invention. The heater core **811** is typically located near the firewall **860**, with an inlet pipe **816** to which an inlet hose **821** is attached. An outlet hose (not shown) is likewise provided. The heater core **811** may be constructed of aluminum with aluminum tanks or plastic tanks. The sacrificial anode **813** can be clipped in, welded on, clamped on, or fastened by any method to protect against corrosion. The anode support **819** can be constructed from any metal, plastic, or other material that is capable of securing a sacrificial anode and attaching to the inlet pipe **816** of the heater core **811**. The sacrificial anode **813** that is enclosed within the device is allowed to be dropped into the radiator heater core **811**. This device "shortens" the inlet radiator hose and/or heater inlet hose in efforts to replicate all of the before mentioned electrolysis prevention devices in any form. As with previous embodiments, the device **812** optionally may or may not be connected via ground wire to the wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like.

FIG. **9B** is an enlarged view of a portion of the inlet hose **821** and inlet pipe **816** of the heater core **811** of FIG. **9A** but with an alternative electrolysis prevention device **912** installed therein in accordance with a seventh preferred embodiment of the present invention. The device **912** includes a short pipe insert **970** connected to the inlet hose **821** and to which one end of an anode holder **919** is attached. A sacrificial anode **913** is disposed at the opposite end of the anode holder **919**. The pipe insert **970** is connected to the inlet pipe **816** via a short rubber sleeve **972**. Clamps **974,976,978** are used to connect the hose **821** to the pipe insert **970** and the sleeve **972** to the pipe insert **970** and to the inlet pipe **816**. This device "shortens" the inlet radiator hose and/or heater inlet hose in efforts to replicate all of the before mentioned sacrificial anodes in any form. It will be appreciated that a similar device may be utilized with radiators **11**. As with previous embodiments, the device **912** optionally may or may not be connected via ground wire to the wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like.

FIGS. **10A-10D** illustrate a radiator **211** having an electrolysis prevention shield **1012** in accordance with an eighth preferred embodiment of the present invention. FIG. **10A** is a front schematic view of a downflow aluminum radiator **211** with two vertically extending, metal mounting pegs **80**, each of which is covered by an electrolysis prevention shield **1012**. FIG. **10B** is an enlarged fragmentary front schematic view of a portion of the radiator **211** of FIG. **10A** showing the radiator **211** secured to a vehicle frame **82** via the mounting peg **80**. FIG. **10C** is an enlarged fragmentary top view of the portion of the radiator **211** of FIG. **10B**, further illustrating the radiator **211** secured to the vehicle frame **82**. FIG. **10D** is a front cross-sectional view of the portion of the radiator **211** of FIGS. **10B** and **10C** taken along line **10-10**. The electrolysis prevention shield **1012** comprises a sheathing of durable insulating material, such as rubber or plastic, that can be molded or otherwise affixed to a metal component of a radiator or heater core that is electrically exposed to metal components in the vehicle. The insulating material of the electrolysis prevention device **1012** acts as a barrier to prevent metal-on-metal contact which leads to electrolysis and eventually corrosion of portions of a radiator, thereby causing leaks. In at least one preferred embodiment, the device **1012** is comprised of insulating material, such as polyolefin or other "shrink wrap" polymers, that shrinks tightly over whatever it is covering when heat is applied.

As shown in FIGS. **10B-10D**, the mounting peg **80** secures the radiator **211** to an appropriate vehicle frame **82** by extending through a circular opening **86** in the frame **82** that is slightly larger than the diameter of the mounting peg **80**. In order to insulate the radiator **211** from vibration and other effects, the interface between the mounting peg **80** and the opening **86** is conventionally sealed with an o-ring **84**. However, it is believed that small electrical currents may continue to flow between the metal material of the frame **82** and the metal material of the mounting pegs **80**, and that such currents contribute the electrolysis problems described elsewhere herein. The electrolysis prevention shield **1012** shown herein aids in preventing this by completely surrounding the mounting peg **80**, shielding the mounting peg **80** from direct contact with both the o-ring **84** and the vehicle frame **82** and otherwise preventing current flow between the elements **80,82**. The electrolysis prevention shield **1012** is perhaps best utilized with one or more of the various electrolysis prevention devices described elsewhere. In this regard, it will be appreciated that the broken lines of FIGS. **10B-10D** illustrate the portion of the mounting peg **80** that may be hidden beneath the electrolysis prevention shield **1012**, and that FIG. **10D** shows a cross-section of the electrolysis prevention shield **1012** "shrink-wrapped" or otherwise molded or assembled to tightly fit the shape and contour of the mounting peg **80**. The tight fit afforded thereby prevents the shield **1012** from becoming separated or disconnected from the mounting peg **80** and thus provides better protection against any direct metal-on-metal contact.

Based on the foregoing information, it will be readily understood by those persons skilled in the art that the present invention is susceptible of broad utility and application. Many embodiments and adaptations of the present invention other than those specifically described herein, as well as many variations, modifications, and equivalent arrangements, will be apparent from or reasonably suggested by the present invention and the foregoing descriptions thereof, without departing from the substance or scope of the present invention.

Accordingly, while the present invention has been described herein in detail in relation to one or more preferred embodiments, it is to be understood that this disclosure is only illustrative and exemplary of the present invention and is made merely for the purpose of providing a full and enabling disclosure of the invention. The foregoing disclosure is not intended to be construed to limit the present invention or otherwise exclude any such other embodiments, adaptations, variations, modifications or equivalent arrangements; the present invention being limited only by the claims appended hereto and the equivalents thereof.

What is claimed is:

1. An electrolysis prevention device, for preventing corrosion caused by electrolysis, comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. The electrolysis prevention device of claim 1 wherein the sacrificial anode is made of aluminum.

3. The electrolysis prevention device of claim 1 wherein the sacrificial anode is made of magnesium.

4. The electrolysis prevention device of claim 1 wherein the sacrificial anode is made of zinc.

5. The electrolysis prevention device of claim 1 wherein the anode holder is grounded to a vehicle.

6. The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a heater core.

10. A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. A method of preventing corrosion of an engine heat exchange component comprising adding or installing a sacrificial anode assembly within the heat exchange component adjacent an inlet thereof.

13. An electrolysis prevention device, for preventing corrosion caused by electrolysis, comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. A engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

* * * * *

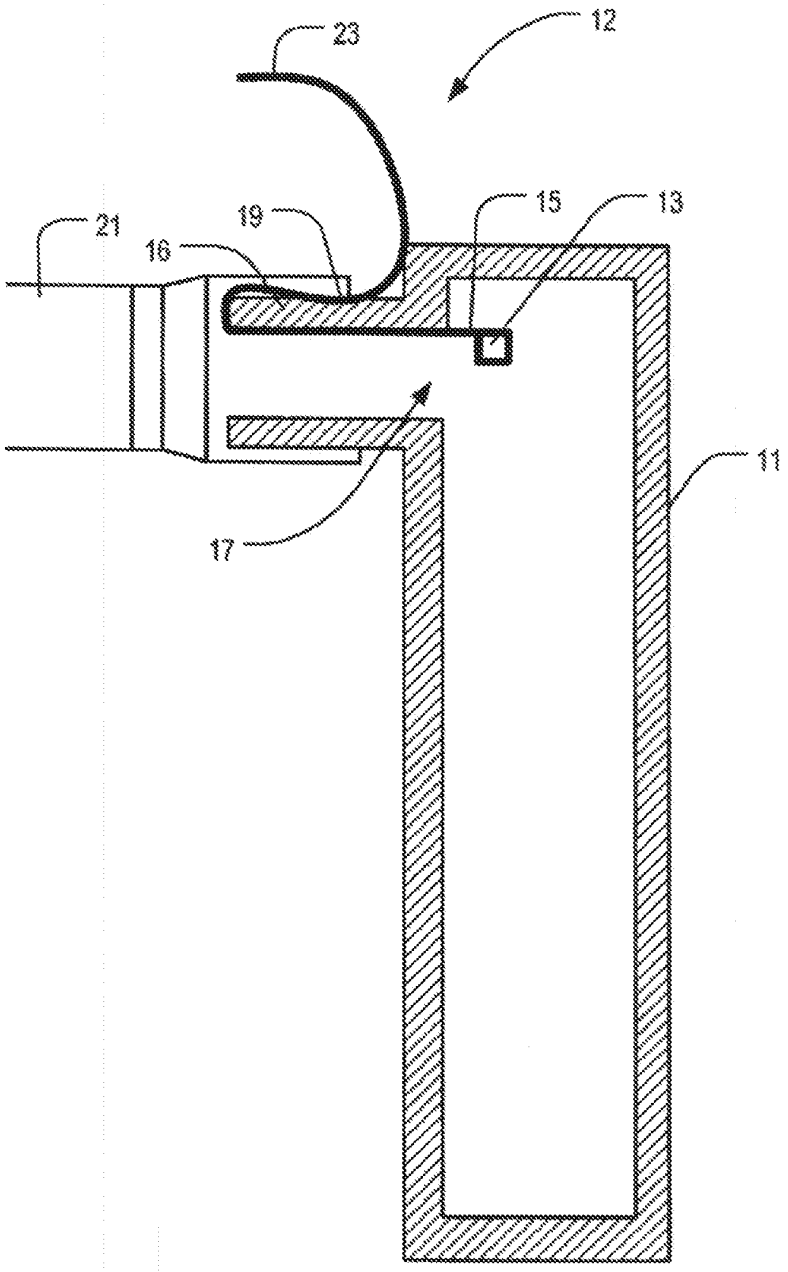


FIG. 1A

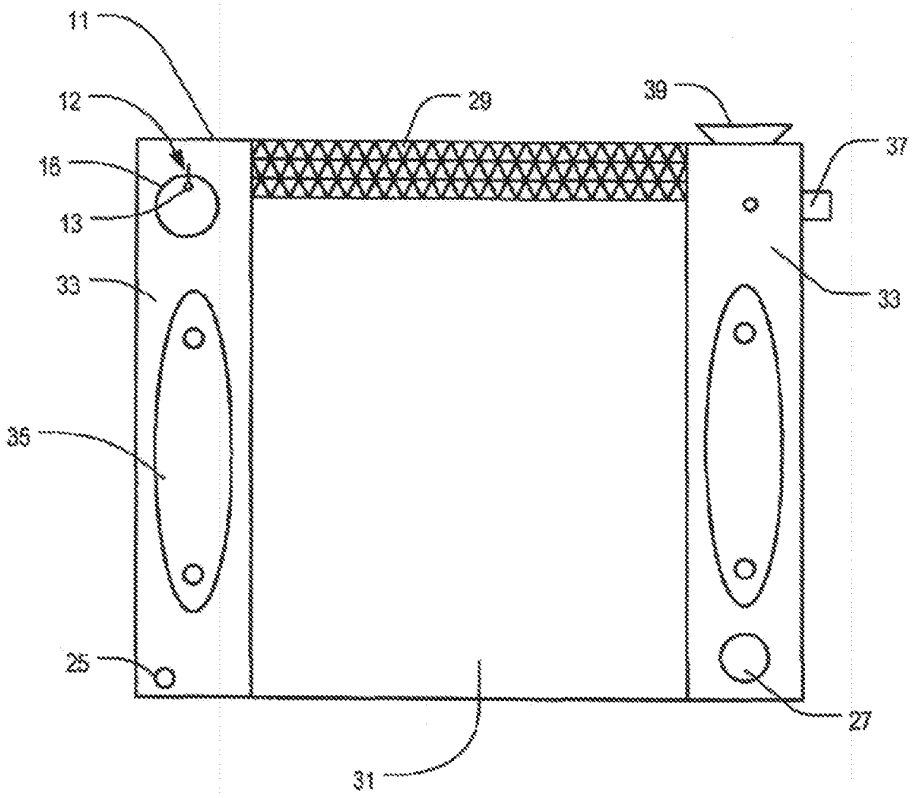


FIG. 1B

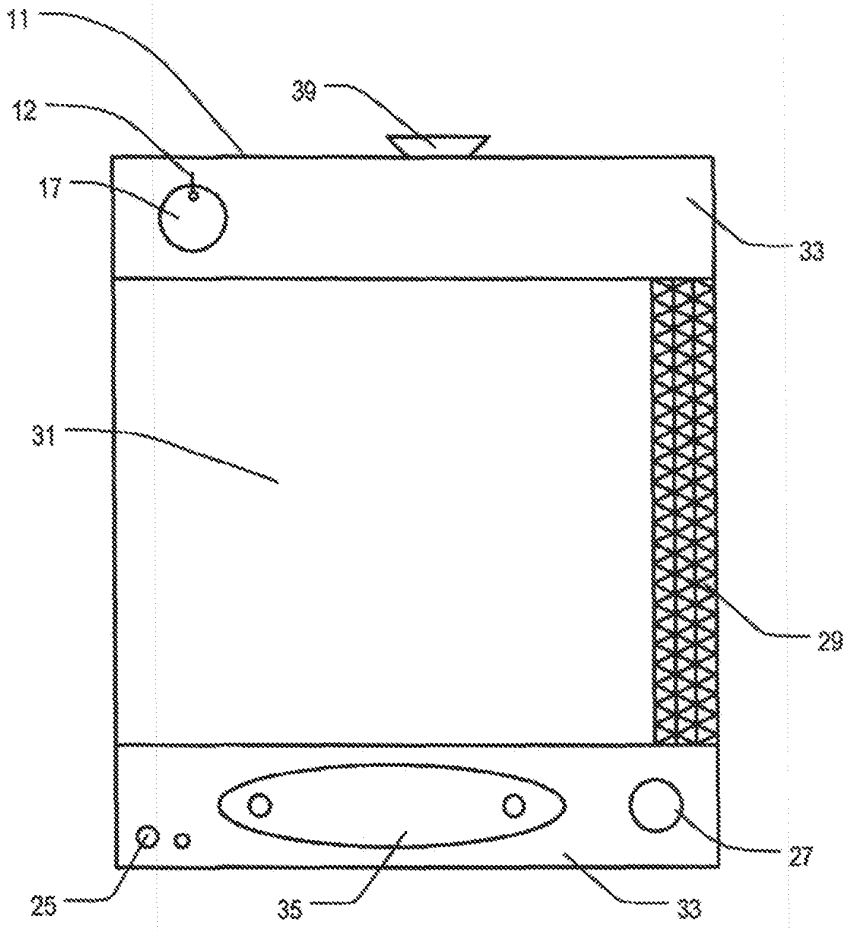


FIG. 1C

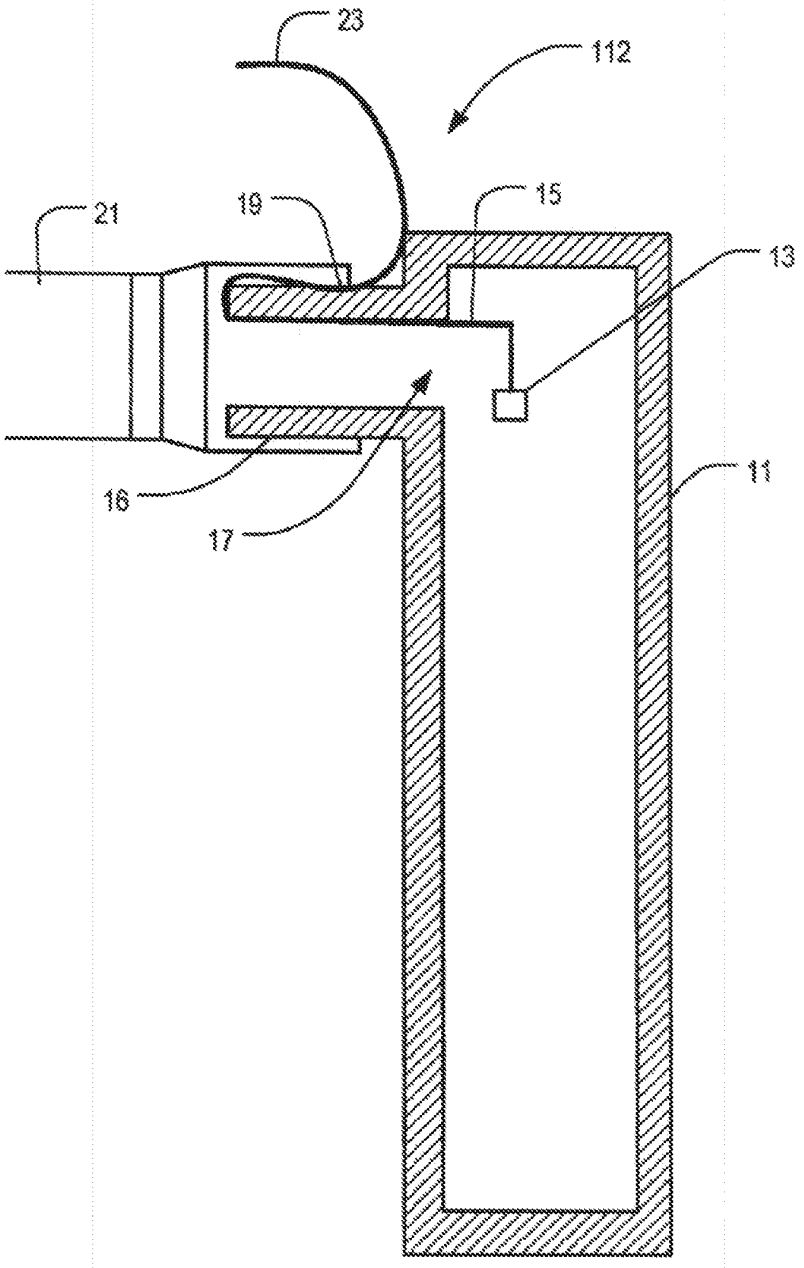


FIG. 2A

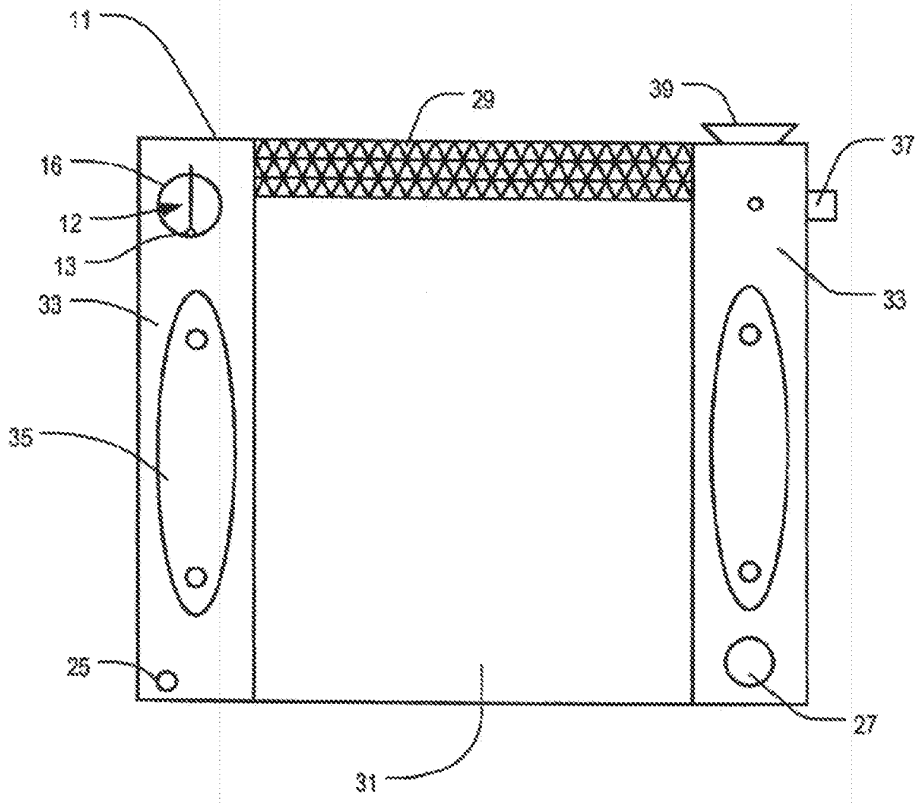


FIG. 2B

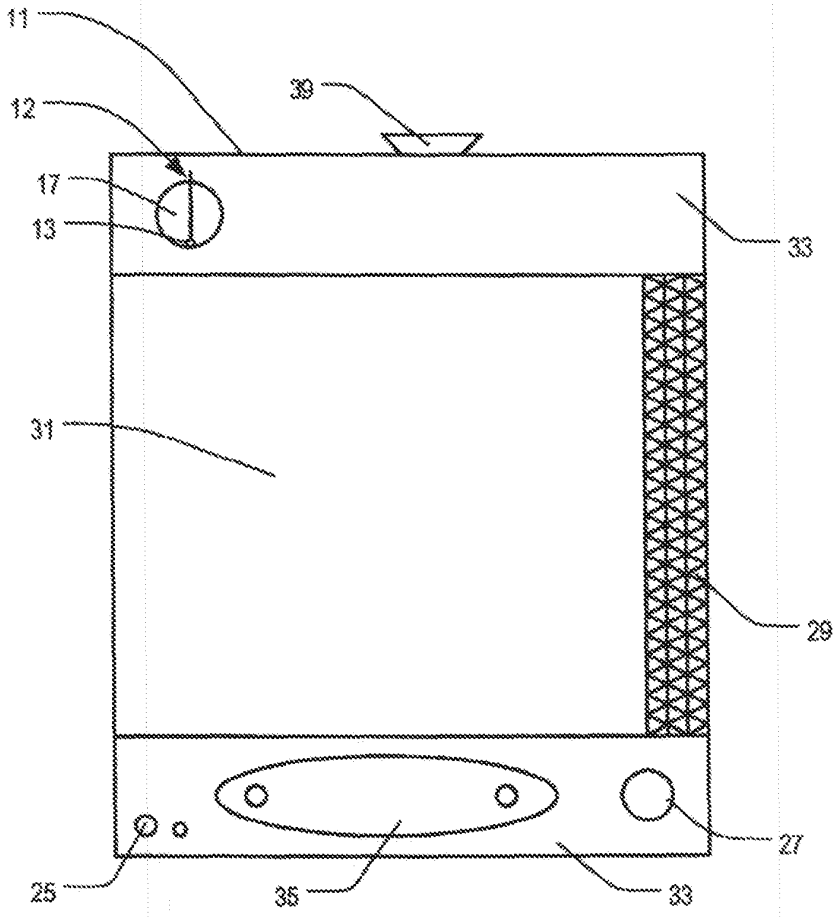


FIG. 2C

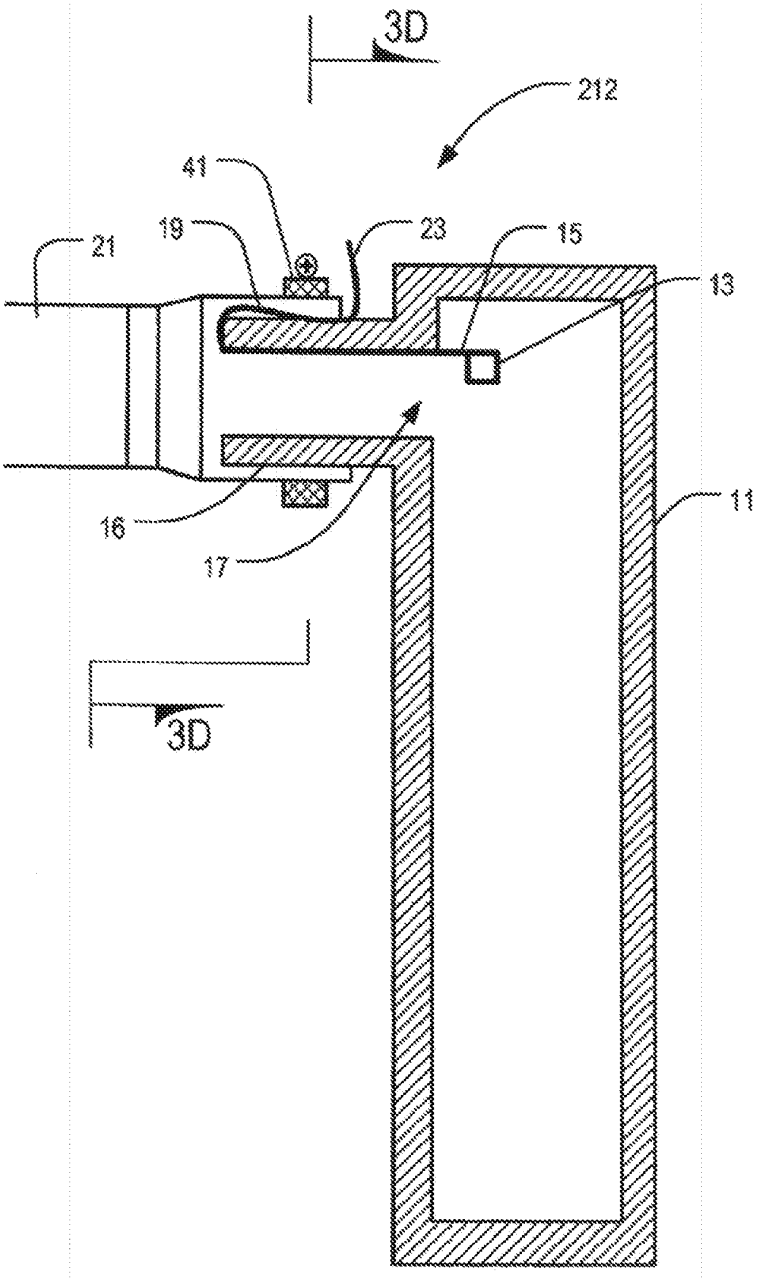


FIG. 3A

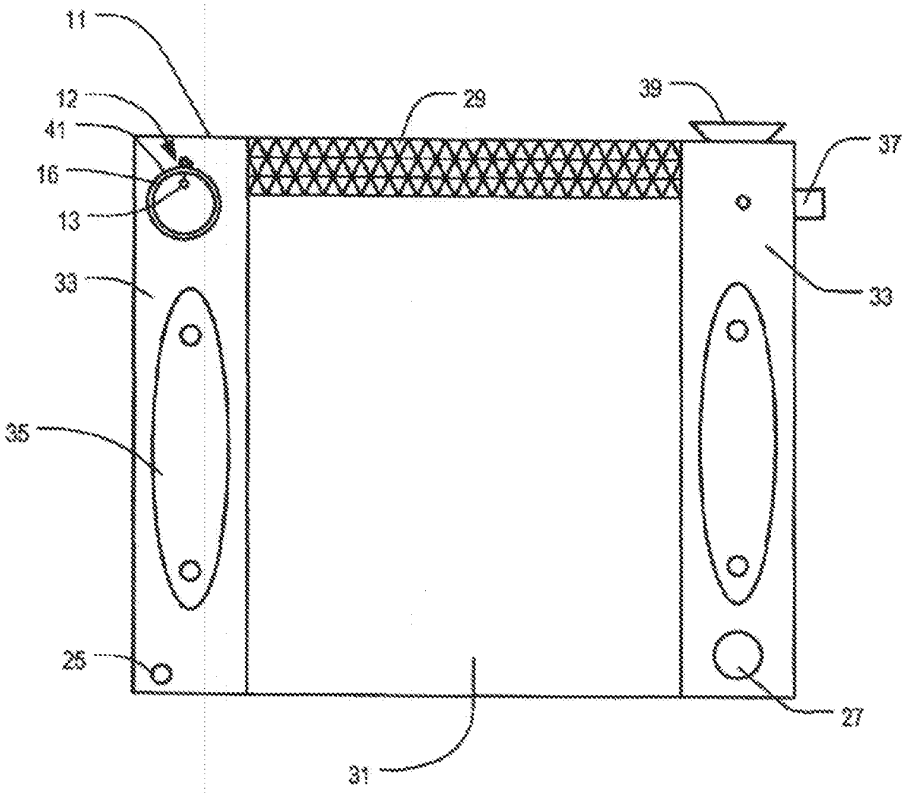


FIG. 3B

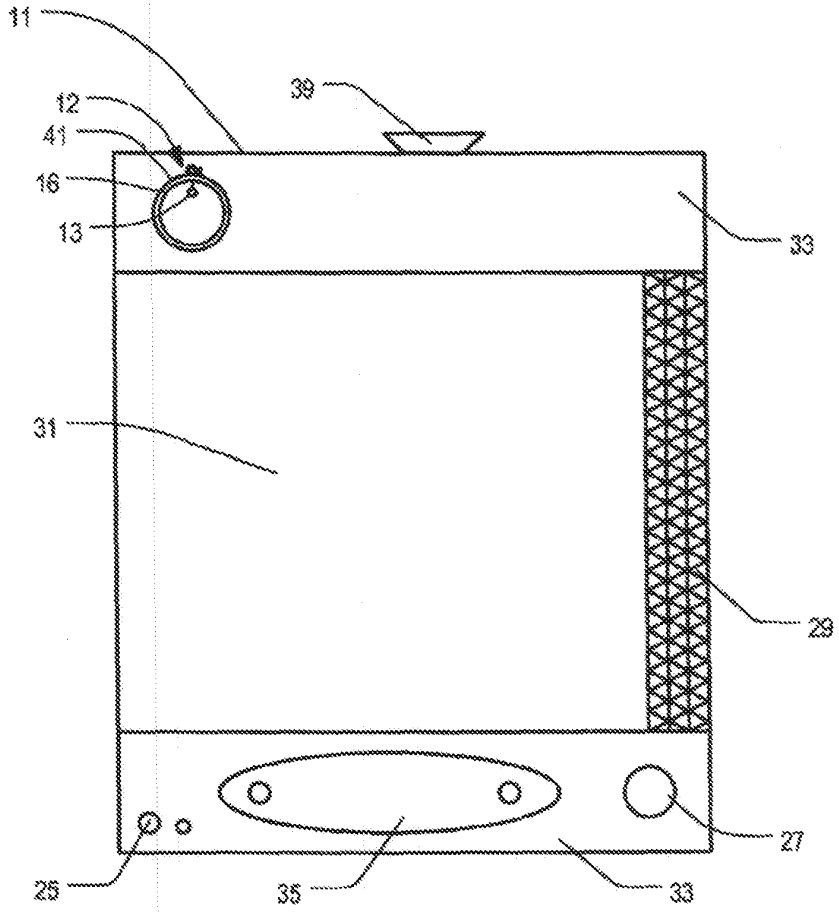


FIG. 3C

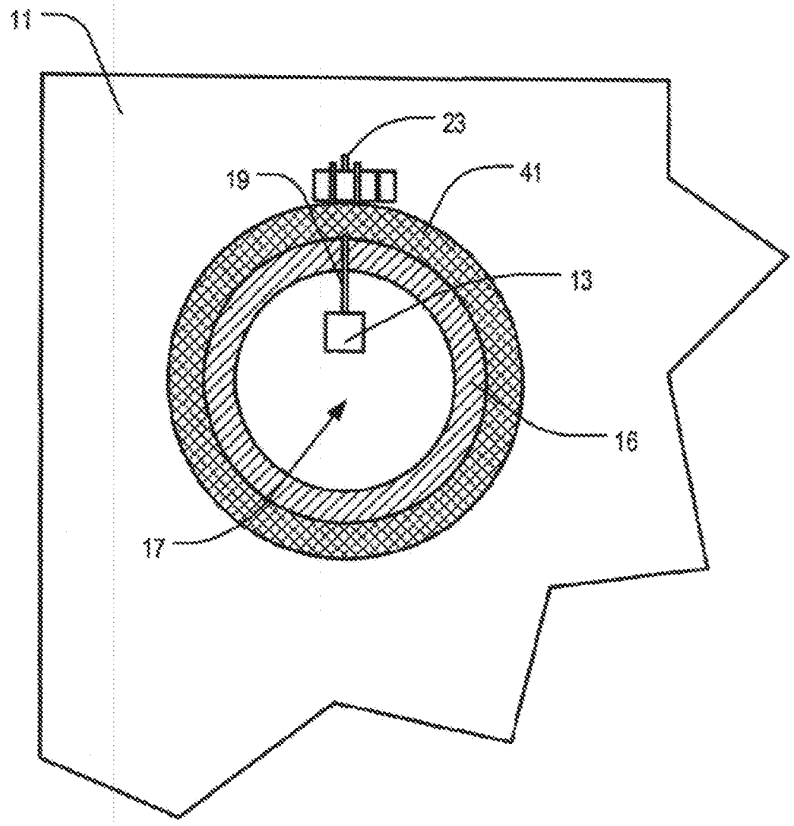


FIG. 3D

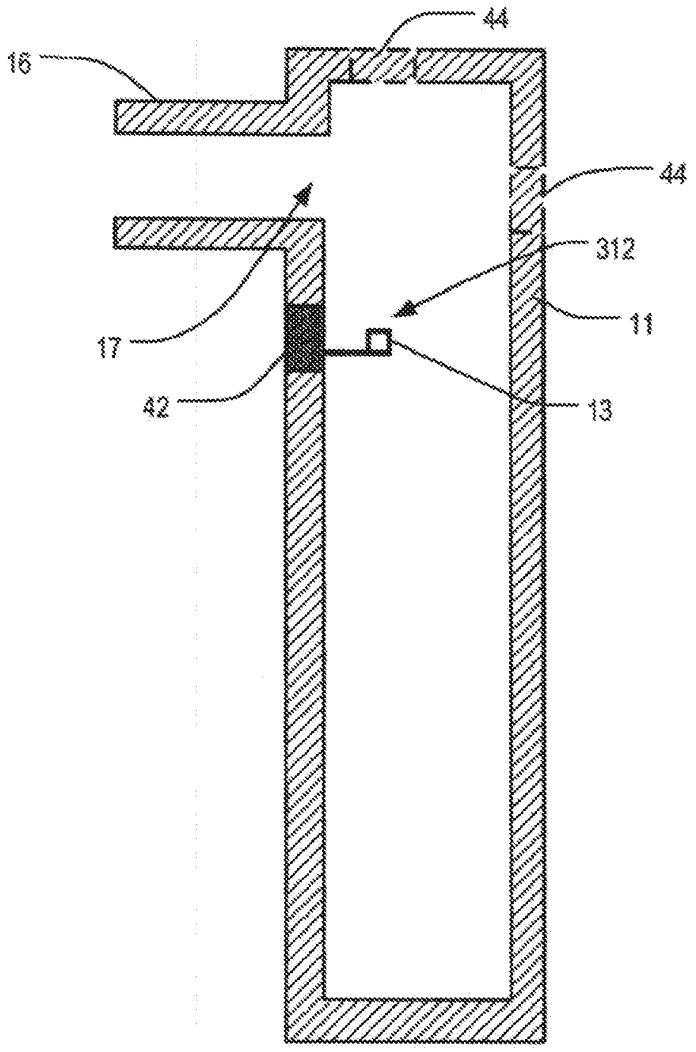


FIG. 4A

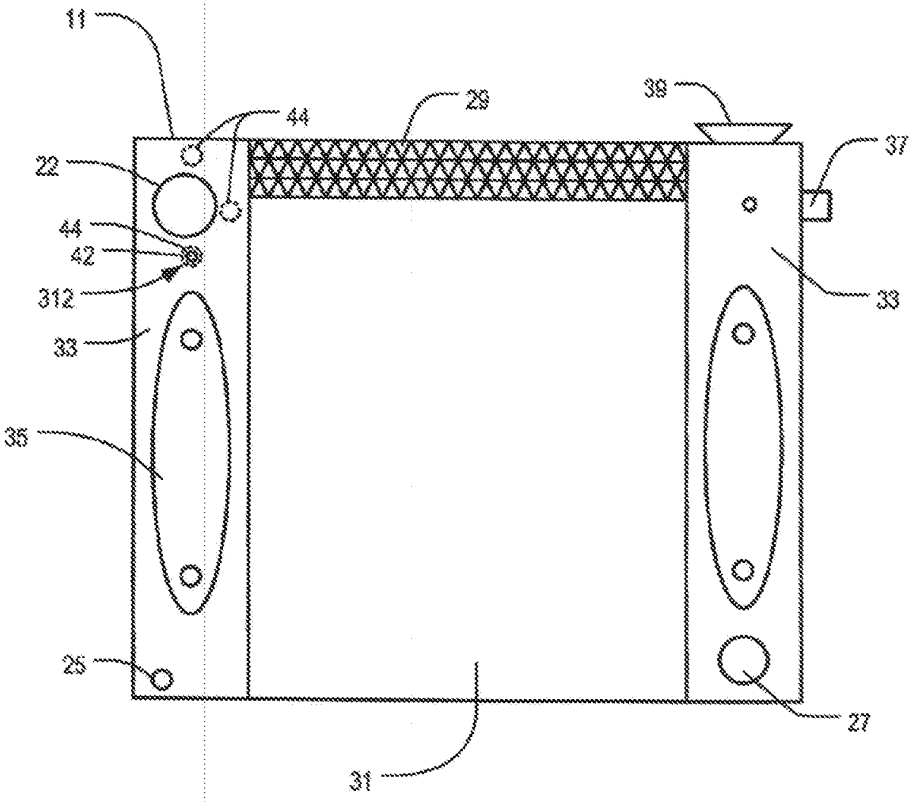


FIG. 4B

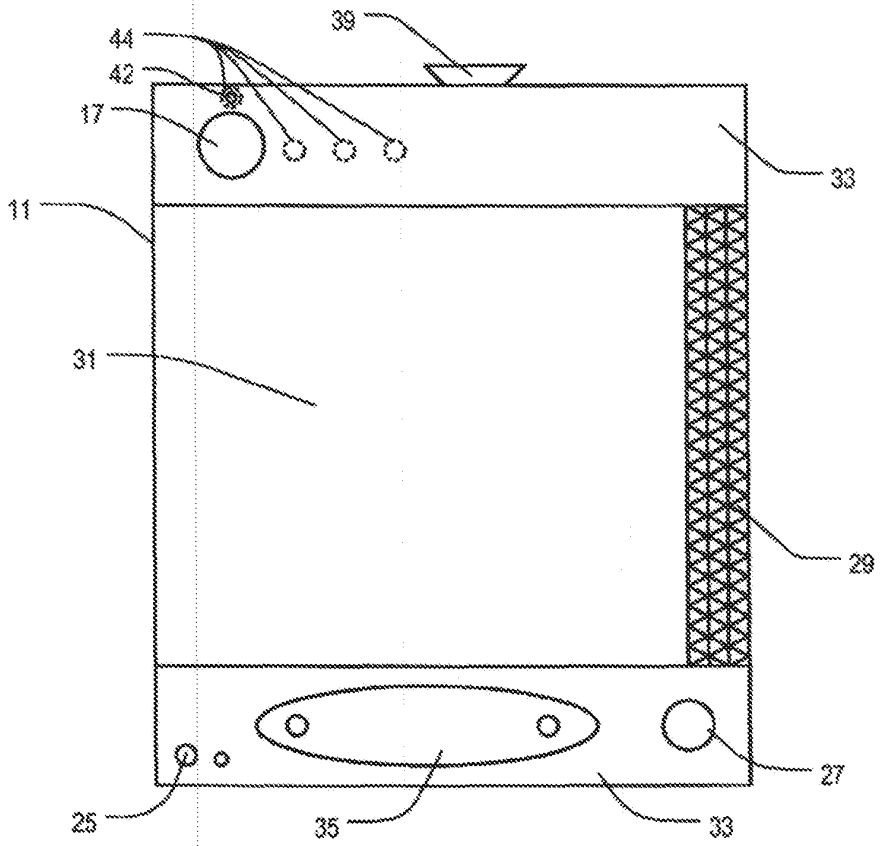


FIG. 4C

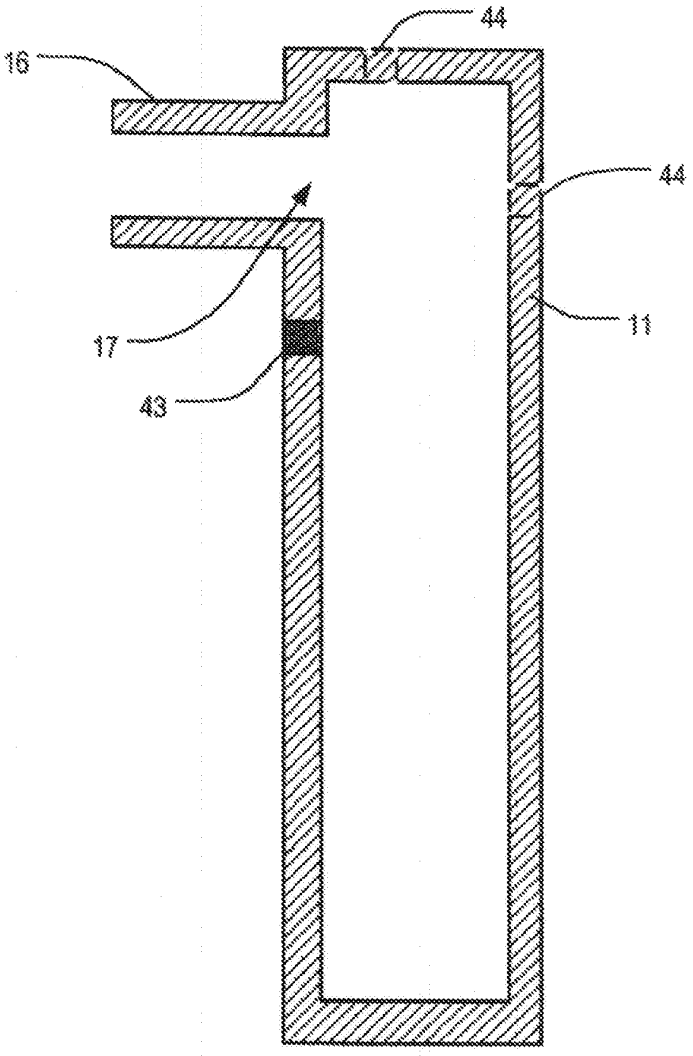


FIG. 5A

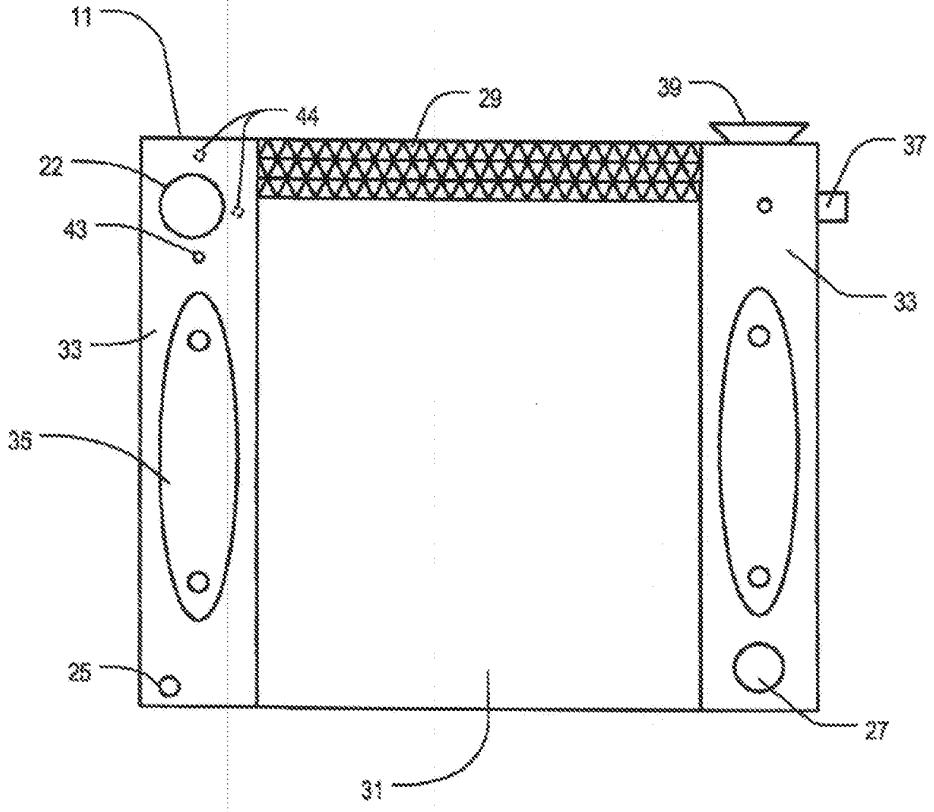


FIG. 5B

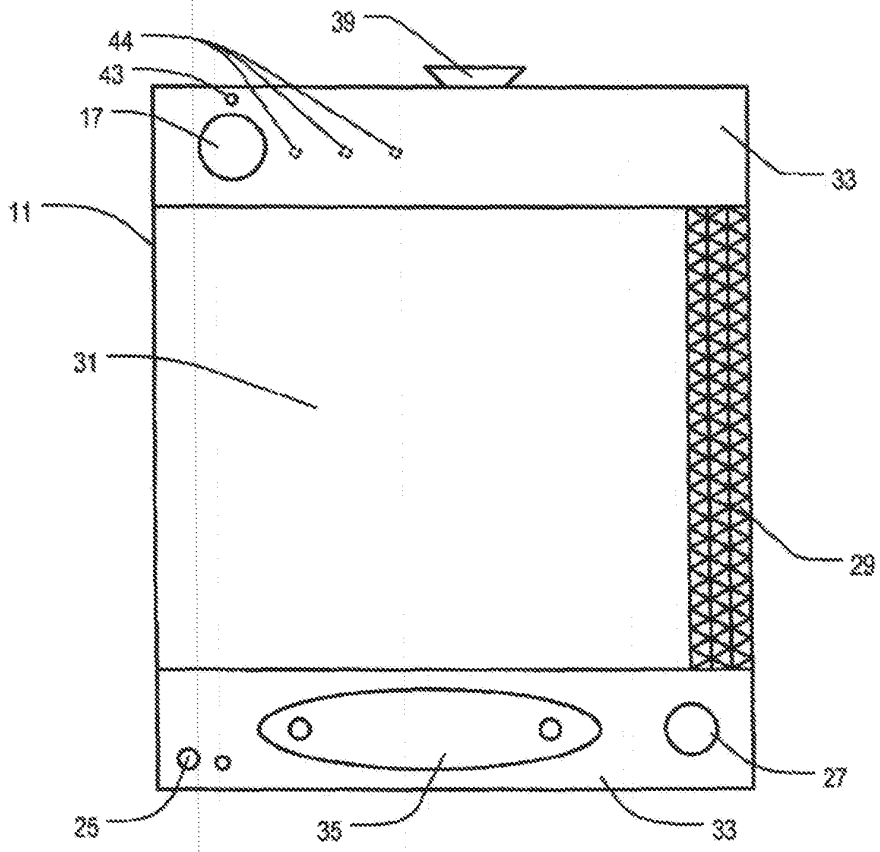


FIG. 5C

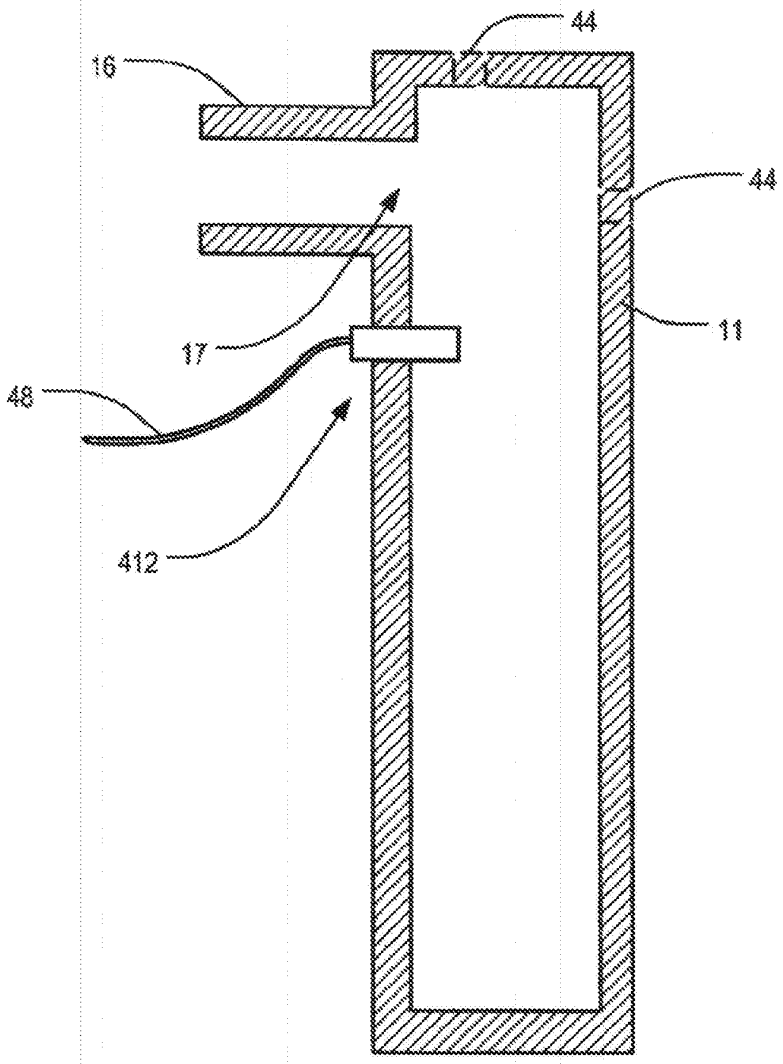


FIG. 6A

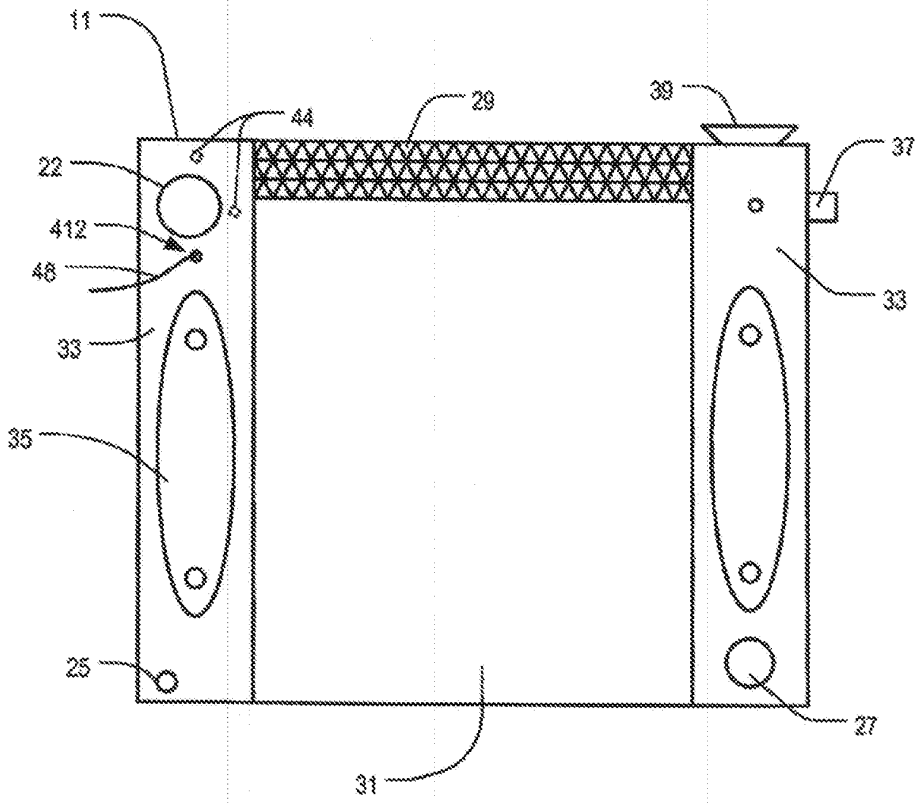


FIG. 6B

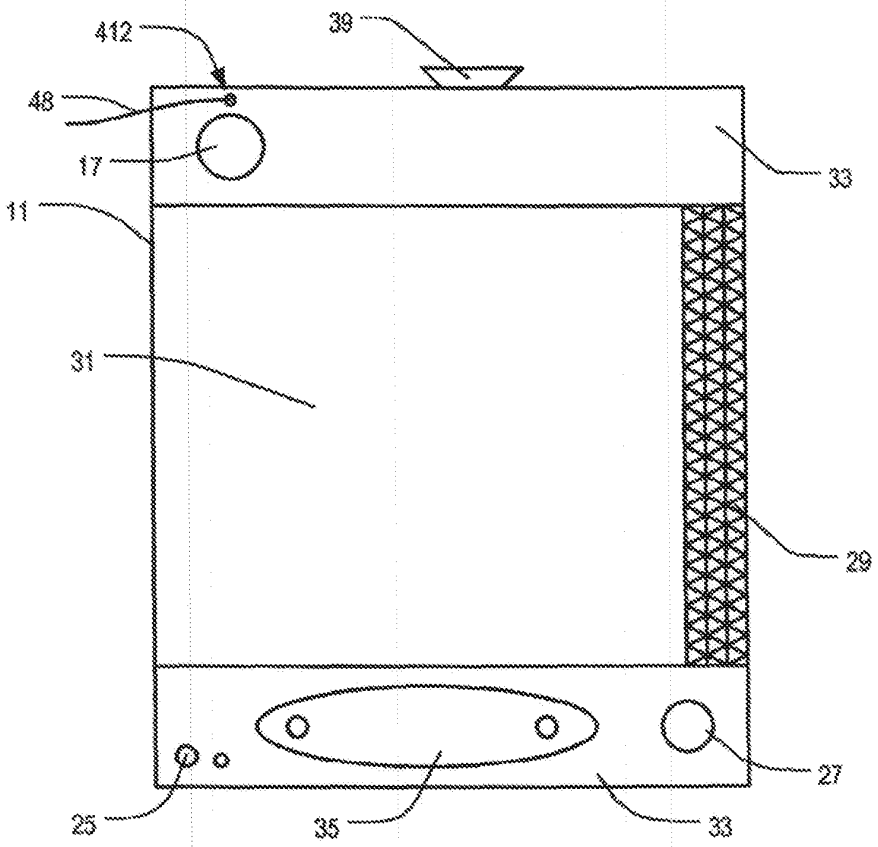


FIG. 6C

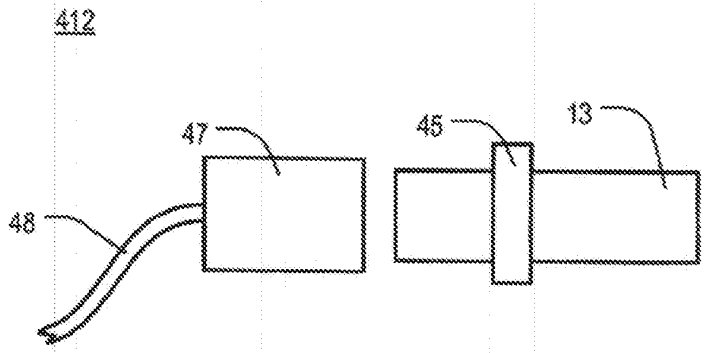


FIG. 7A

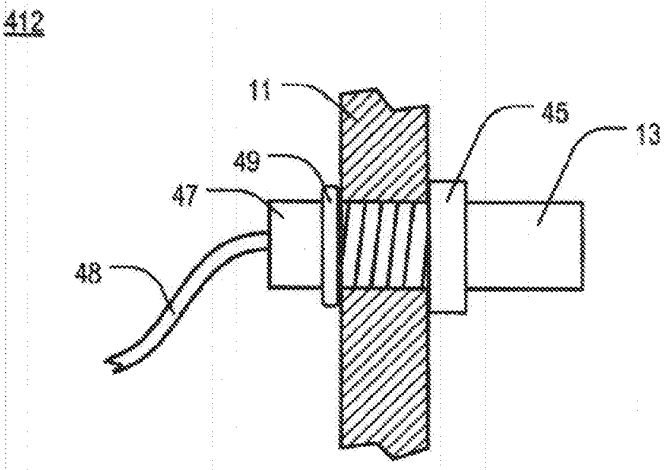


FIG. 7B

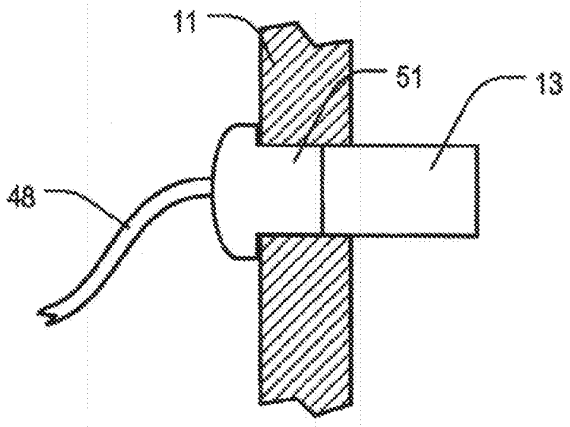


FIG. 7C

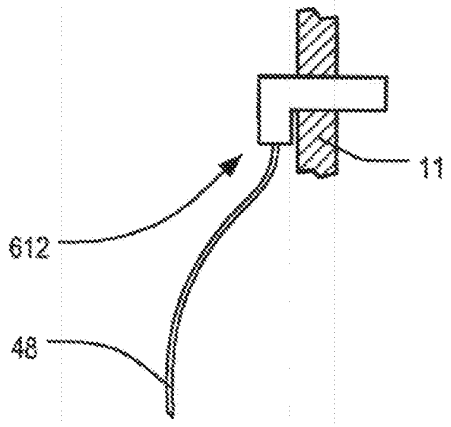


FIG. 8A

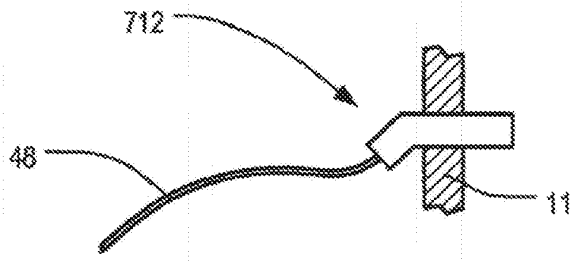


FIG. 8B

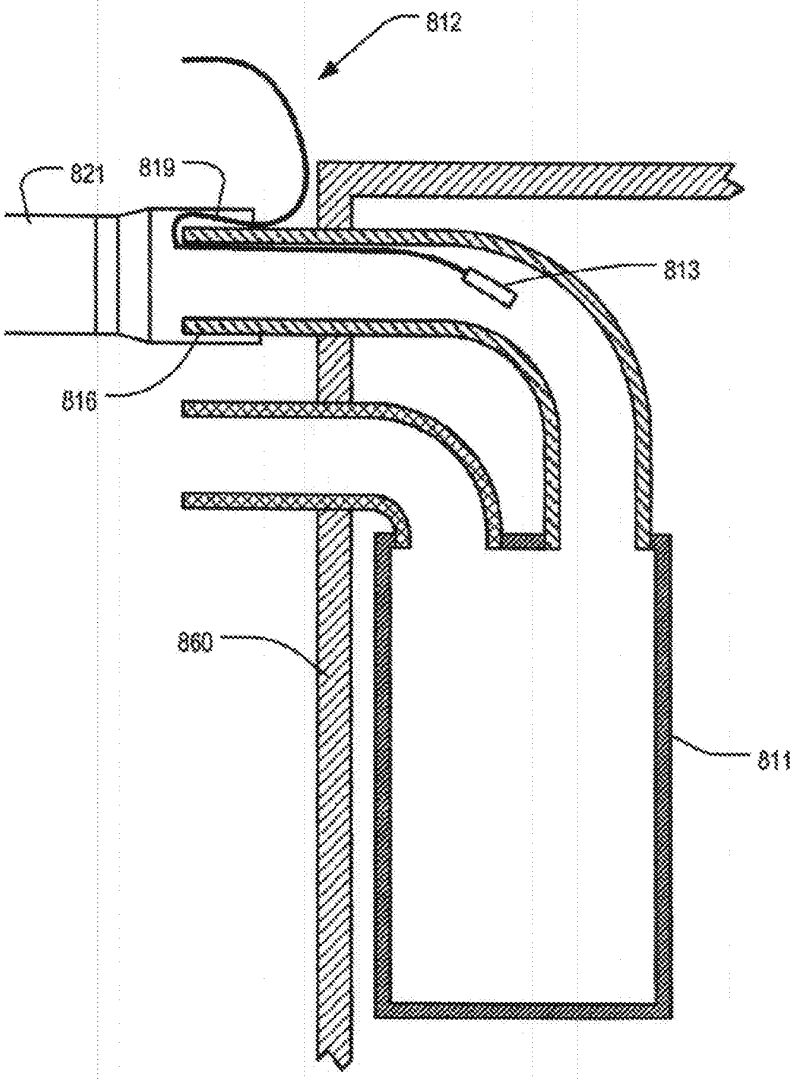


FIG. 9A

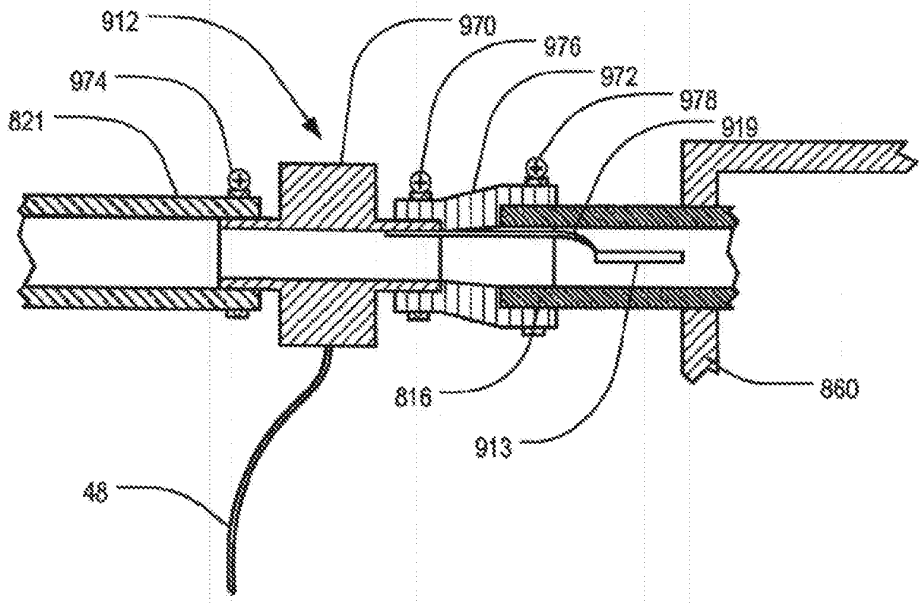


FIG. 9B

211

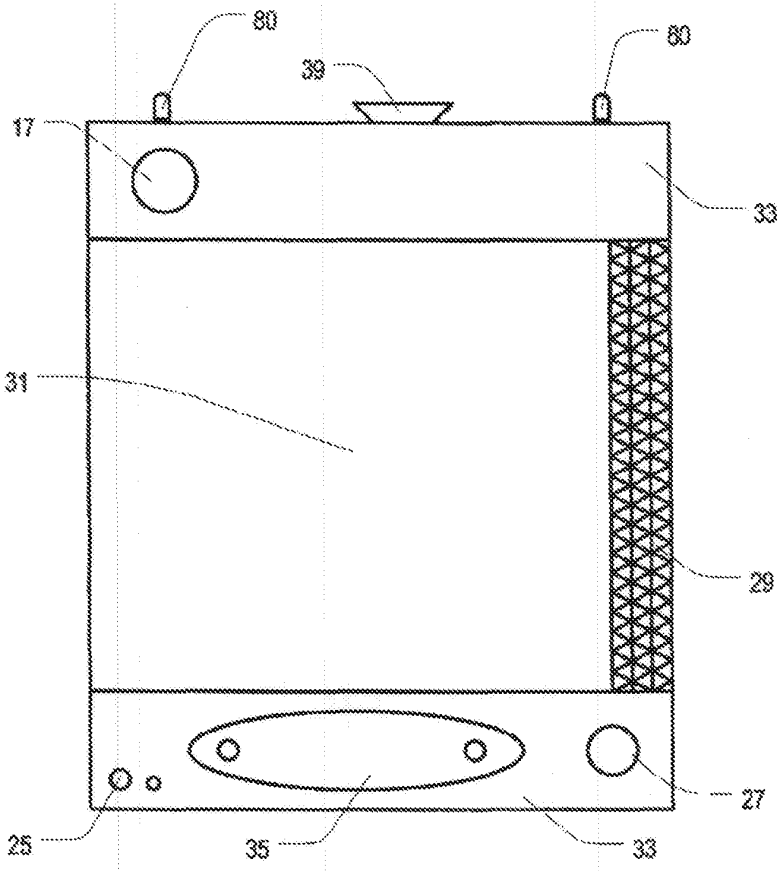


FIG. 10A

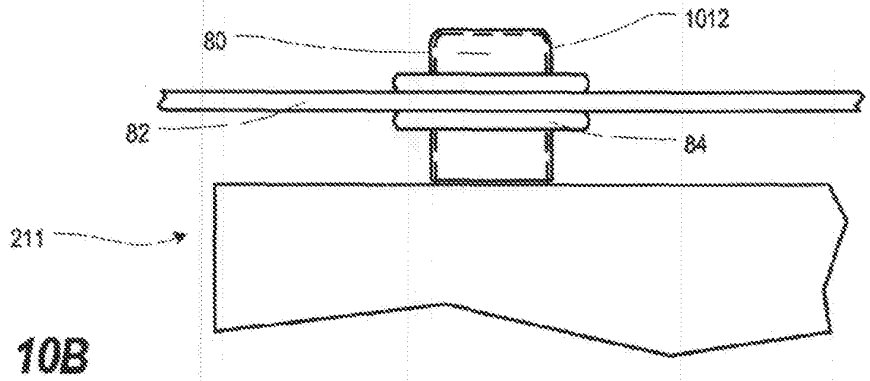


FIG. 10B

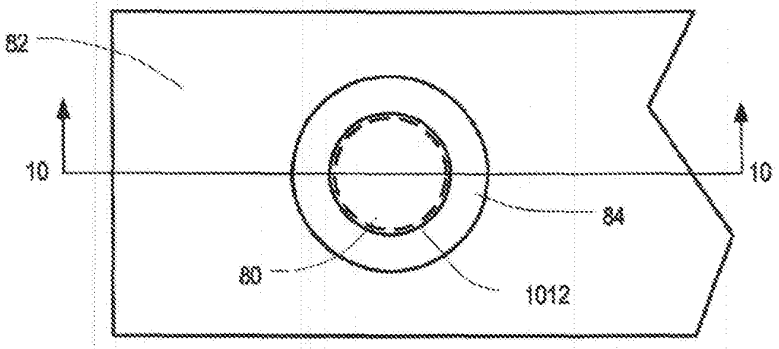


FIG. 10C

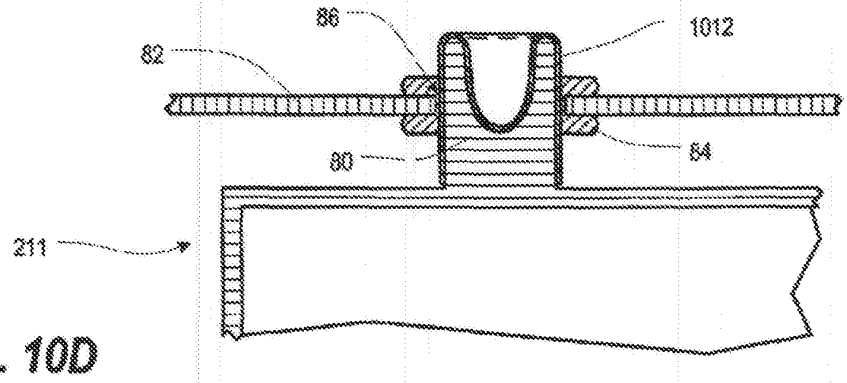


FIG. 10D

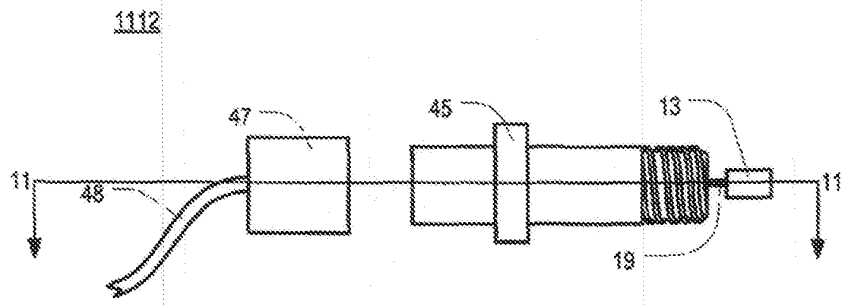


FIG. 11A

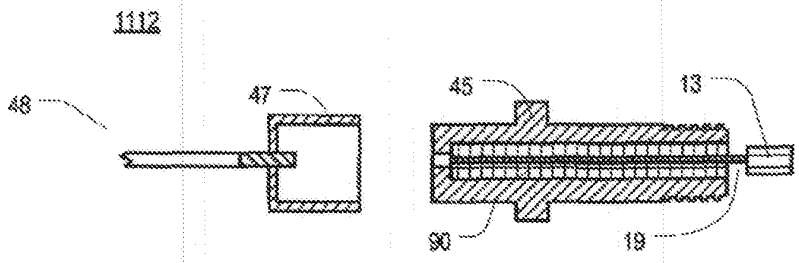


FIG. 11B

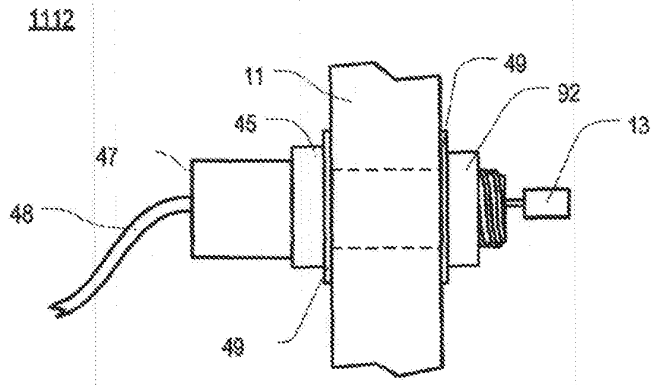


FIG. 11C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Frank Petrosino	Group Art Unit: Unknown
Serial No.: Reissue of U.S. Patent No. 8,236,145	Examiner: Unknown
Filed: August 5, 2014	Atty. Dkt. No.: PET744/58000
For: ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE	Confirmation No.: Unknown

PRELIMINARY AMENDMENT FILED WITH REISSUE APPLICATION

VIA EFS WEB

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

Sir:

The current paper is filed concurrently with a reissue application for reissue of U.S. Patent No. 8,236,145. Should any fees under 37 C.F.R. §§ 1.16 to 1.21 be deemed necessary for any reason relating to these materials, or should any fees be necessary in order to obtain an extension of time in which to respond at any time related to the prosecution of this application, the Commissioner is hereby authorized to deduct said fees from Vinson & Elkins L.L.P. Deposit Account No. 220365/PET744/58000.

Entry of the following amendments and examination of the claims is respectfully requested.

1. An electrolysis prevention device, for preventing corrosion caused by electrolysis, comprising: a sacrificial anode made of an active metal; and an anode holder supporting the sacrificial anode; wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. The electrolysis prevention device of claim 1 wherein the sacrificial anode is made of aluminum.

3. The electrolysis prevention device of claim 1 wherein the sacrificial anode is made of magnesium.

4. The electrolysis prevention device of claim 1 wherein the sacrificial anode is made of zinc.

5. The electrolysis prevention device of claim 1 wherein the anode holder is grounded to a vehicle.

6. The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a heater core.

10. A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. A method of preventing corrosion of an engine heat exchange component comprising adding or installing a sacrificial anode assembly within the heat exchange component adjacent an inlet thereof.

13. An electrolysis prevention device, for preventing corrosion caused by electrolysis, comprising: a sacrificial anode made of an active metal; and an anode holder supporting the sacrificial anode; wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. A engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

Amendments to the Claims

15. (new) The method of claim 12, wherein said engine heat exchange component is a radiator.

16. (new) The method of claim 15, wherein said sacrificial anode consists essentially of an active metal.

17. (new) The method of claim 16, wherein said sacrificial anode consists essentially of aluminum, magnesium, or zinc.

18. (new) The method of claim 12, wherein said sacrificial anode is added or installed in a fitting hole in the radiator adjacent to said inlet.

19. (new) The method of claim 12, wherein said sacrificial anode is grounded to said motor vehicle.

20. (new) A method of preventing corrosion of an engine heat exchange component comprising adding or installing a sacrificial anode assembly within the heat exchange component within 10 inches of the center of an inlet thereof.

21. (new) The method of claim 20, wherein said engine heat exchange component is a radiator.

22. (new) The method of claim 21, wherein said engine heat exchange component comprises one or more aluminum components.

23. (new) A radiator for use in a motor vehicle, comprising:

a) an inlet

b) an added or installed sacrificial anode, wherein said sacrificial anode is disposed within 10 inches of the center of said inlet.

24. (new) The radiator of claim 23, wherein said sacrificial anode is located adjacent to said inlet.

25. (new) The radiator of claim 23, wherein said sacrificial anode is added or installed in a fitting hole in the radiator within 10 inches of the center of said inlet.

26. (new) The radiator of claim 23, wherein said sacrificial anode is added or installed onto a surface within 10 inches of the center of said inlet.

27. (new) The radiator of claim 23, wherein said sacrificial anode is added or installed onto a surface located adjacent said inlet.

28. (new) The radiator of claim 23, wherein said sacrificial anode comprises of an active metal.

29. (new) The radiator of claim 23, wherein said sacrificial anode consists essentially of aluminum, magnesium or zinc.

30. (new) The radiator of claim 23, wherein said sacrificial anode is grounded to said motor vehicle.

31. (new) The radiator of claim 23, wherein said radiator comprises one or more aluminum components.

Remarks

Status of the Claims

Claims 1-14 as issued remain in this application.

New claims 15-31 have been added.

Claims 1-31 are pending in the reissue application.

Support for claim 15, 18, 20, 21, and 23-27 is found at least at col. 2, lns. 29-33 and at the paragraphs beginning at col 2, ln. 66 and extending to col. 3, ln. 16.

Support for claims 16, 17, 22, 28, 29 and 31 is found at least at col. 6, lns. 10-58 and at col. 2, lns 51-59.

Support for claims 19 and 30 is found at least at col. 2, lns. 51-59.

No new matter has been added by these amendments.

Conclusion

It is Applicant's belief that the newly added claims are fully in compliance with 37 C.F.R. 1.173 (d)(2). Applicant submits that all the claims are now in condition for immediate allowance and reissue and respectfully requests an indication of such favorable action. If the Examiner has any questions or comments that would expedite progression of the claims to allowance, a telephone call to the undersigned would be welcomed.

Respectfully submitted,



Timothy S. Corder
Reg. No. 38,414
Agent for Applicant

Vinson & Elkins L.L.P.
First City Tower
1001 Fannin Street, Suite 2500
Houston, TX 77002-6760
512.542.8446
Date: August 5, 2014

PTO/AIA/14 (12-13)
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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	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

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.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Frank		Petrosino	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Concord	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	3929 Amarillo Dr.		
Address 2			
City	Concord	State/Province	NC
Postal Code	28027	Country i	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).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	21586		
Email Address	iptldocket@velaw.com	Add Email	Remove Email
Email Address	tcorder@velaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	Electrolysis Prevention Device and Method of Use		
Attorney Docket Number	PET744/4-001REUS/58000	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	27	Suggested Figure for Publication (if any)	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Filing By Reference :

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **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).
Either enter 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:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	21586		

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.
When referring to the current application, please leave the application number blank.

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	reissued of	12/631903	2009-12-07	8236145	2012-08-07

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

This section allows for the applicant to claim priority to a foreign application. 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(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◯ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Mailing Address Information For Applicant:			
Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

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Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

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Mailing Address Information For Assignee including Non-Applicant Assignee:			
Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature				Date (YYYY-MM-DD)	2014-08-05
First Name	Timothy	Last Name	Corder	Registration Number	38414

Additional Signature may be generated within this form by selecting the Add button.

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.**

Electronic Patent Application Fee Transmittal	
Application Number:	
Filing Date:	
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Filer:	Timothy S. Corder/Bobbie Melder
Attorney Docket Number:	PET744/4-001REUS/58000
Filed as Micro Entity	

Reissue (Utility) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility Reissue Basic	3014	1	70	70
Design and Utility Reissue Basic	3114	1	150	150
Design and Utility Reissue Basic	3314	1	540	540
Pages:				
Claims:				
Reissue claims in excess of 20	3205	11	20	220
Independent claims reissue	3204	2	105	210
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1190**

Electronic Acknowledgement Receipt	
EFS ID:	19783542
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Timothy S. Corder/Bobbie Melder
Filer Authorized By:	Timothy S. Corder
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	05-AUG-2014
Filing Date:	
Time Stamp:	18:41:55
Application Type:	Reissue (Utility)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1190
RAM confirmation Number	4844
Deposit Account	220365
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 1.16 (National application filing, search, and examination fees) 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 1.20 (Post Issuance 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	Transmittal Reissue Application	PET7444001REUS080514ReissueTransmittal.pdf	307148 b70b6f59f1ddf7496aff9c211ff803ac05897192	no	2
Warnings:					
Information:					
2	Certification of Micro Entity (Gross Income Basis)	PET7444001REUS080514ReissueEntity.pdf	119567 18e826666ce741e5b65855f1aba06533f0bc5046	no	2
Warnings:					
Information:					
3	Transmittal Reissue Application	PET7444001REUS080514ReissueSpec.pdf	3815125 3285989f6fcf575526b83b4caf6fd4fc79763d1c	no	7
Warnings:					
Information:					
4	Transmittal Reissue Application	PET7444001REUS080514ReissueDrawings.pdf	4617832 1835d144c195f358e54030116bf4b3ae4ea806a2	no	27
Warnings:					
Information:					
5	Preliminary Amendment	PET7444001REUS080514ReissuePreAmdmt.pdf	1530886 3ba8b97ed14a49d7279afadd9b43b85a68c3506a	no	6
Warnings:					
Information:					
6	Application Data Sheet	PET7444001REUS080514ReissueADS.pdf	321860 edf9acf10a3ad132404eac484656b16284845946	no	6
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
7	Fee Worksheet (SB06)	fee-info.pdf	37514 7af4f6d2380ec4160d792aa096af42c60f231601	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	10749932		

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.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/452,339

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	70
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	150
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	540
TOTAL CLAIMS (37 CFR 1.16(i))	31 minus 20 =	* 11			OR	x 20 =	220
INDEPENDENT CLAIMS (37 CFR 1.16(h))	5 minus 3 =	* 2				x 105 =	210
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	1190

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	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))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	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))									
	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.

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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	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/452,339	08/05/2014	1759	1190	PET744/4-001REUS/58000	31	5

CONFIRMATION NO. 7313

21586
VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

FILING RECEIPT

OC000000070157768

Date Mailed: 08/13/2014

Receipt is acknowledged of this reissue 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**

Inventor(s)

Frank Petrosino, Concord, NC;

Applicant(s)

Frank Petrosino, Concord, NC;

Power of Attorney: The patent practitioners associated with Customer Number 21586

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No
** **MICRO ENTITY** **

Title

Electrolysis Prevention Device and Method of Use

Preliminary Class

204

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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 (1-866-999-4258).

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 AssetsControl, 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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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000

CONFIRMATION NO. 7313

21586
VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

FORMALITIES LETTER

OC000000070157769

Date Mailed: 08/13/2014

NOTICE TO FILE MISSING PARTS OF REISSUE APPLICATION

Filing Date Granted

An application number and filing date have been accorded to this reissue application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The inventor's oath or declaration has not been submitted.
- Consent of assignee is missing. 37 CFR 1.172 requires that a reissue oath/declaration be accompanied by the written consent of all assignees.

  An inventor's oath or declaration in compliance with 37 CFR 1.63 or 1.64 (and 37 CFR 1.175) executed by or with respect to each inventor is required. For a reissue application, the inventor's oath or declaration must be submitted prior to examination and cannot be postponed. See 37 CFR 1.175(e). An assignee of the entire interest can execute the oath or declaration if: (1) the application does not seek to enlarge the scope of the claims of the original patent; or (2) the application for the original patent was filed under 37 CFR 1.46 by the assignee of the entire interest. A substitute statement under 37 CFR 1.64 in lieu of an oath or declaration may be submitted in the circumstances provided for in 35 U.S.C. 115(d) and 37 CFR 1.64.

- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Micro entity discount is in effect.

- $ **35** surcharge.
- $(**0**) previous unapplied payment amount.
- $ **35** TOTAL FEE BALANCE DUE.

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/dalyon/

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

To: bmelder@velaw.com,IPTLdocket@velaw.com,dwilcox@velaw.com
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 21586

Aug 13, 2014 05:22:33 AM

Dear PAIR Customer:

VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 21586 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14452339	APP.FILE.REC	08/13/2014	PET744/4-001REUS/58000
	NTC.MISS.PRT	08/13/2014	PET744/4-001REUS/58000

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

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HOUSTON, TX 77002-6760

Courtesy Reminder for
Application Serial No: 14/452,339

Attorney Docket No:
PET744/4-001REUS/58000
Customer Number: 21586
Date of Electronic Notification: 08/13/2014

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

An email notification regarding the correspondence was sent to the following email address(es) associated with your customer number:

bmelder@velaw.com
IPTLdocket@velaw.com
dwilcox@velaw.com

To view your correspondence online or update your email addresses, please visit us anytime at **https://sportal.uspto.gov/secure/myportal/privatepair.** If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov or call 1-866-217-9197.

PTO/AIA/80 (07-12)
Approved for use through 11/30/2014. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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 TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

■ Practitioners associated with Customer Number: 21586

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

■ The address associated with Customer Number: 21586

OR

☐ Firm or Individual Name

Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	[signature]	Date	9/2/14
Name	Frank Petrosino	Telephone	704-714-9281 / 704-715-282
Title			

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.

Electronic Patent Application Fee Transmittal

Application Number:	14452339
Filing Date:	05-Aug-2014
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Filer:	Timothy S. Corder/Bobbie Melder
Attorney Docket Number:	PET744/4-001REUS/58000

Filed as Micro Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Late Filing Fee for Oath or Declaration	3051	1	35	35
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**35**

Electronic Acknowledgement Receipt	
EFS ID:	20116747
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Timothy S. Corder/Bobbie Melder
Filer Authorized By:	Timothy S. Corder
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	11-SEP-2014
Filing Date:	05-AUG-2014
Time Stamp:	18:07:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$35
RAM confirmation Number	4713
Deposit Account	220365
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 1.16 (National application filing, search, and examination fees) 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 1.20 (Post Issuance 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		PET7444001REUS091114ResponseMParts.pdf	1915411 970df59db57c701756703af5ee528a8d1fbdf05f	yes	6

Multipart Description/PDF files in .zip description

Document Description	Start	End
Applicant Response to Pre-Exam Formalities Notice	1	2
Reissue dec filed in accordance with MPEP 1414	3	4
Consent of Assignee accompanying the declaration	5	5
Power of Attorney	6	6

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	29943 3ec6ff4a303de39ff1f3aa27259d307fecb8e652	no	2

Warnings:

Information:

Total Files Size (in bytes):	1945354

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Frank Petrosino	Group Art Unit: 1759
Patent No.: 8,236,145	Examiner: Unknown
Filed: August 5, 2014 (Reissue Application)	Atty. Dkt. No.: PET744/4-001REUS/58000
For: ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE	Confirmation No. 7313

RESPONSE TO 37 C.F.R. § 1.53(b) NOTICE

VIA EFS-WEB

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

Sir:

In response to the Notice to File Missing Parts of Nonprovisional Application Filed Under 37 C.F.R. § 1.53(b) dated August 13, 2014 (the "Notice") for which the shortened statutory period for response is October 13, 2014, enclosed are the following documents:

1) Reissue Application Declaration by the Inventor;

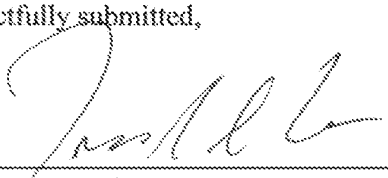
2) Reissue Application: Consent of Assignee; Statement of Non-Assignment; and

3) Power of Attorney.

A fee in the amount of $35.00 (micro entity) is being paid electronically with this filing, which covers the surcharge fee for late submission of the Declaration.

If any additional fees under 37 C.F.R. §§ 1.16 to 1.21 be required for any reason relating to the enclosed materials, or should an overpayment be included herein, the Commissioner is authorized to deduct or credit said fees to the Vinson & Elkins L.L.P. Deposit Account No. 22-0365/PET744/4-001REUS/58000.

Respectfully submitted,



Timothy S. Corder
Reg. No. 38,414
Agent for Applicant

Vinson & Elkins L.L.P.
First City Tower
1001 Fannin Street, Suite 2500
Houston, Texas 77002-6760
512.542.8446

Date: September 11, 2014

Doc Code: REIS.DECL
Document Description: Reissue Declaration Filed In Accordance With MPEP 1414

PTO/AIA/06 (08-12)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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.

REISSUE APPLICATION DECLARATION BY THE INVENTOR	Docket Number (Optional) PET744/4-001REUS/58000

I hereby declare that:
Each inventor's residence and mailing address are stated below next to their name.
I believe I am the original inventor or an original joint inventor of the subject matter which is described and claimed in patent number 8,206,146 granted August 7, 2012 and for which a reissue patent is sought on the invention titled Electrical Connector Device and Method of Use

the specification of which:

☐ is attached hereto.

☑ was filed on August 5, 2014 as reissue application number 14/452,339

The above-identified application was made or authorized to be made by me.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

☐ by reason of a defective specification or drawing.

☑ by reason of the patentee claiming more or less than he had the right to claim in the patent.

☐ by reason of other errors.

At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, a claim that the application seeks to broaden must be identified.

This collection of information is required by 37 CFR 1.175. 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 30 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.

(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)

Docket Number (Optional): PET744/4-001REUS/58000

Note: To appoint a power of attorney, use form PTO/AIA/81.

Correspondence Address: Direct all communications about the application to:

☑ The address associated with Customer Number: 21586

OR

☐ Firm or Individual Name	
Address	
City / State / Zip	
Country	
Telephone / Email	

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

Legal name of sole or first inventor (*E.g.*, Given Name (first and middle (if any) and Family Name or Surname)

Frank Petrosino

Inventor's Signature	Date (Optional)

Residence: City	State	Country
Concord	NC	US

Mailing Address

3929 Amarillo Dr.

City	State	Zip	Country
Concord	NC	28027	US

☐ Additional joint inventors are named on the _____ supplemental sheet(s) PTO/AIA/10 attached hereto

PTO/AIA/93 (09-12)
Approved for use through 09/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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.

REISSUE APPLICATION: CONSENT OF ASSIGNEE; STATEMENT OF NON-ASSIGNMENT	Docket Number (Optional) PET744/4-001REUS/58000

This is part of the application for a reissue patent based on the original patent identified below.

Name of Patentee(s)
Frank Petrosino

Patent Number	Date Patent Issued
8,236,145	August 7, 2012

Title of Invention
Electrolysis Prevention Device and Method of Use

1. ☐ Filed herein is a statement under 37 CFR 3.73(c). (Form PTO/AIA/96)

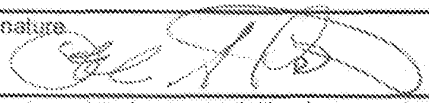
2. ☑ Ownership of the patent is in the inventor(s), and no assignment of the patent is in effect.

One of boxes 1 or 2 above must be checked. If multiple assignees, complete this form for each assignee. If box 2 is checked, skip the next entry and go directly to "Name of Assignee."

The written consent of all assignees and inventors owning an undivided interest in the original patent is included in this application for reissue.

The assignee(s) owning an undivided interest in said original patent is/are _____ and the assignee(s) consents to the accompanying application for reissue.

Name of assignee/inventor (if not assigned)
Frank Petrosino

Signature	Date
	9/3/2014

Typed or printed name and title of person signing for assignee (if assigned)
FRANK AMEDIO PETROSINO

This collection of information is required by 37 CFR 1.172. 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 6 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
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	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/452,339	08/05/2014	1759	1225	PET744/4-001REUS/58000	31	5

CONFIRMATION NO. 7313

UPDATED FILING RECEIPT

21586
VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

OC000000070893387

Date Mailed: 09/22/2014

Receipt is acknowledged of this reissue 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**

Inventor(s)

Frank Petrosino, Concord, NC;

Applicant(s)

Frank Petrosino, Concord, NC;

Power of Attorney: The patent practitioners associated with Customer Number 21586

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 09/19/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/452,339**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No
** **MICRO ENTITY** **

Title

Electrolysis Prevention Device and Method of Use

Preliminary Class

204

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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 (1-866-999-4258).

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 AssetsControl, 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).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/452,339

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	70
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	150
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	540
TOTAL CLAIMS (37 CFR 1.16(i))	31 minus 20 =	* 11			OR	x 20 =	220
INDEPENDENT CLAIMS (37 CFR 1.16(h))	5 minus 3 =	* 2				x 105 =	210
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	1190

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	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))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	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))									
	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.

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
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000

CONFIRMATION NO. 7313

21586
VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

POA ACCEPTANCE LETTER

OC000000070893393

Date Mailed: 09/22/2014

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/11/2014.

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.

/dalyon/

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/452,339	08/05/2014	1759	1225	PET744/4-001REUS/58000	31	5

CONFIRMATION NO. 7313

CORRECTED FILING RECEIPT

21586
VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

OC000000070922591

Date Mailed: 09/23/2014

Receipt is acknowledged of this reissue 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**

Inventor(s)

Frank Petrosino, Concord, NC;

Applicant(s)

Frank Petrosino, Concord, NC;

Power of Attorney: The patent practitioners associated with Customer Number 21586

Domestic Priority data as claimed by applicant

This application is a REI of 12/631,903 12/07/2009 PAT 8236145

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 09/19/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/452,339**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No
** **MICRO ENTITY** **

Title

Electrolysis Prevention Device and Method of Use

Preliminary Class

204

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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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 (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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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.

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NOT GRANTED

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/452,339	Filing Date 08/05/2014	☐ To be Mailed

ENTITY: ☐ LARGE ☐ SMALL ☒ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
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☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
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☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
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AMENDMENT	08/05/2014	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
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	Independent (37 CFR 1.16(h))	* 5	Minus	***5	= 0	X $105 =	0
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	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
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	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
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ENTITY: ☐ LARGE ☐ SMALL ☒ MICRO

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FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
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☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
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☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
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APPLICATION AS AMENDED – PART II

AMENDMENT	08/05/2014	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
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	☐ Application Size Fee (37 CFR 1.16(s))						
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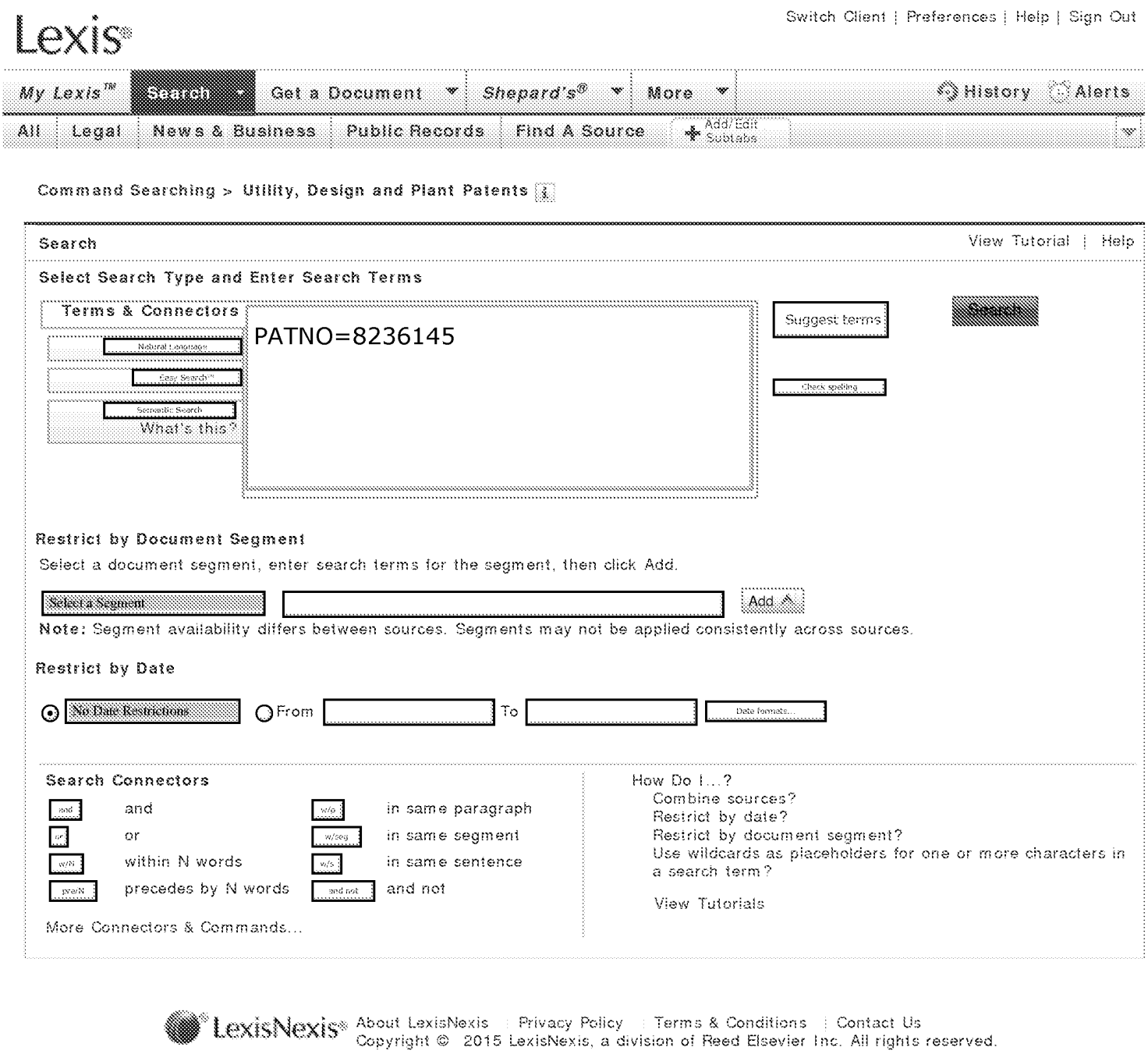
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631903 (12) 8236145 August 7, 2012

UNITED STATES PATENT AND TRADEMARK OFFICE GRANTED PATENT

8236145

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August 7, 2012

Electrolysis prevention device and method of use

REISSUE:
August 5, 2014 - Reissue Application filed, Ex. Gp.: 1759; Re. S.N: 14/452,339 , (O.G. October 14, 2014)

INVENTOR: Petrosino, Frank - Concord, North Carolina, United States of America (US), United States of America ()

APPL-NO: 631903 (12)

FILED-DATE: December 7, 2009

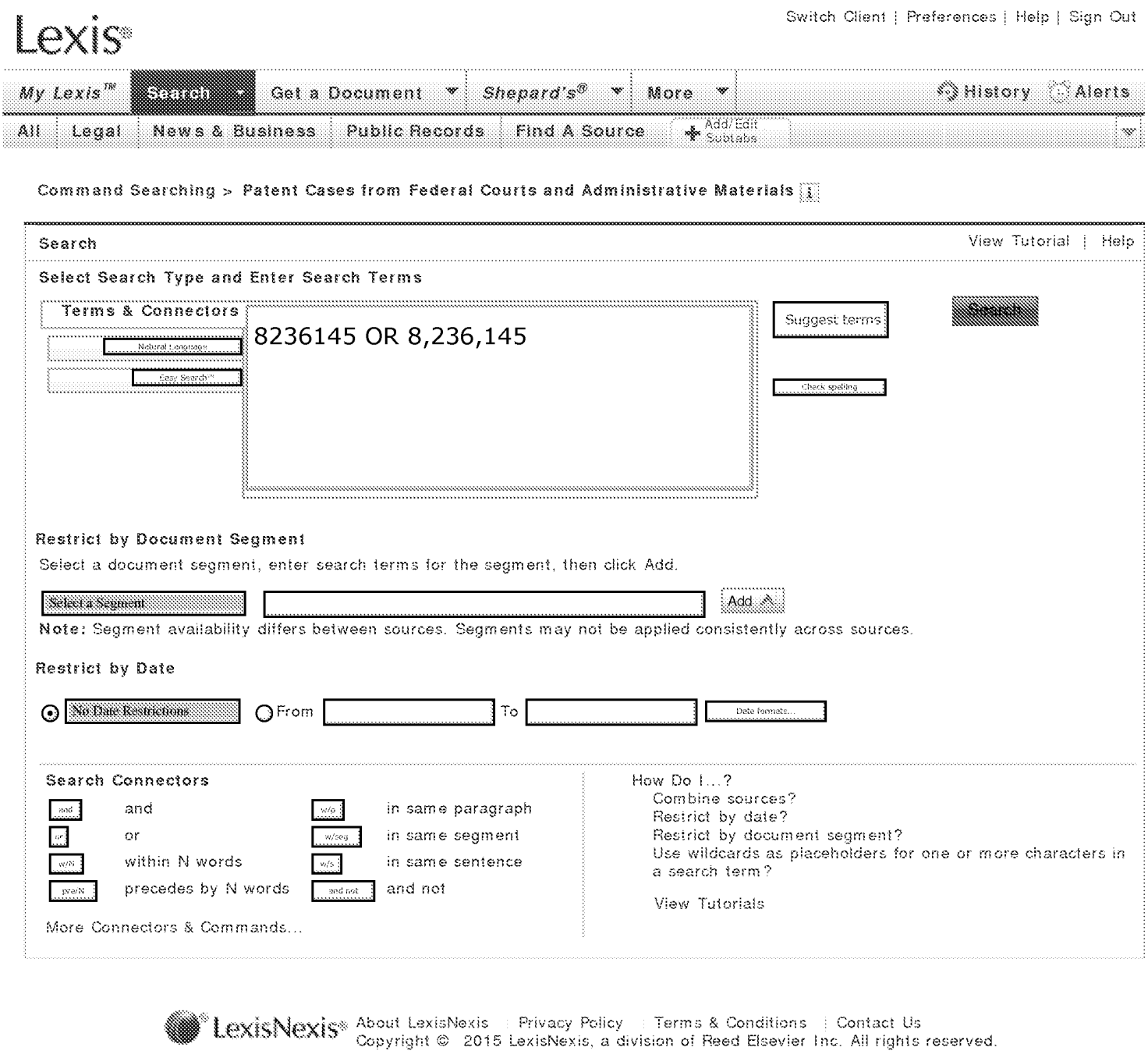
GRANTED-DATE: August 7, 2012

ASSIGNEE-AT-ISSUE:
PETROSINO FRANK, United States of America (US)

CORE TERMS: radiator, anode, electrolysis, prevention, sacrificial, inlet, heater, corrosion, engine, holder, schematic, aluminum, picnic basket, hose, plug, installed, tank, heat exchange, grounded, mounting, pipe, peg, optionally, shield, ground wire, cross-sectional, downflow, harness, wiring, heat

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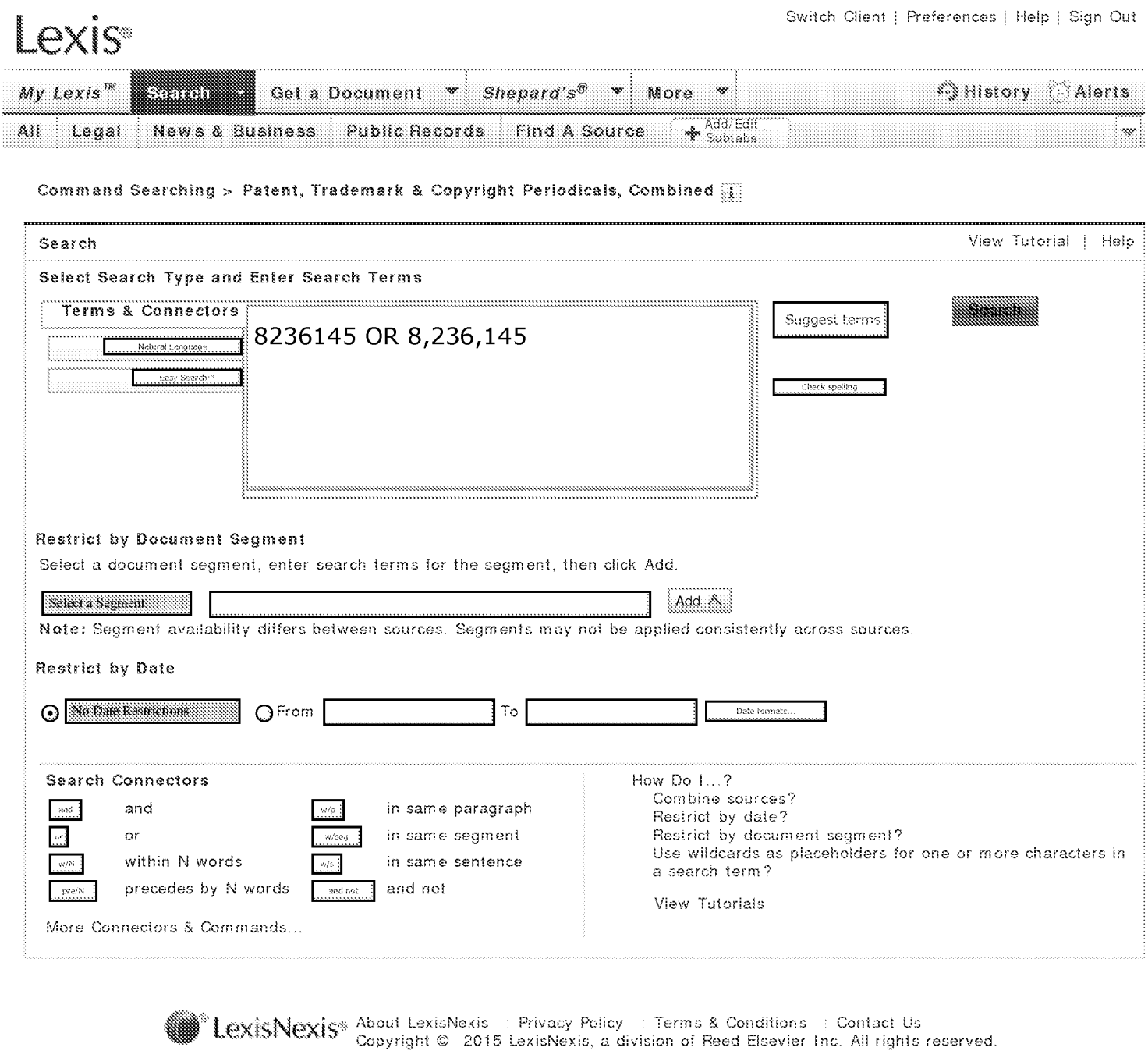
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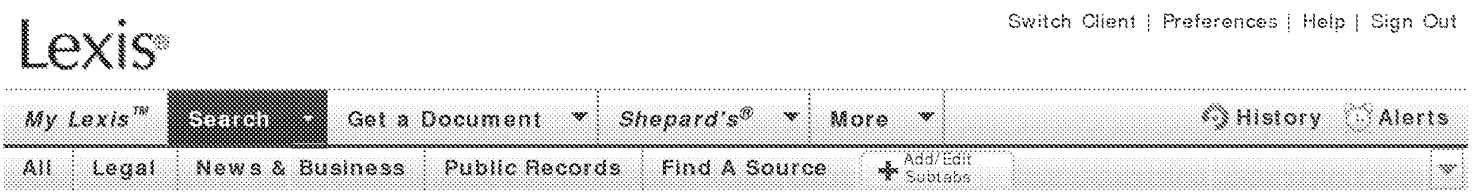
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U.S. Patents Awarded to Inventors in North Carolina (Aug. 14) Targeted News Service August 14, 2012 Tuesday 2:03 PM EST

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BYLINE: Targeted News Service Targeted News Service

DATELINE: Alexandria, VA

BODY:

ALEXANDRIA, Va , Aug. 14 -- The following federal patents were awarded to inventors in North Carolina.

* * *

Ohio Inventors Develop Patent for Imaging System

ALEXANDRIA, Va., Aug. 14 -- David L. Wilson, Pepper Pike, Ohio, Debashish Roy, Shaker Heights, Ohio, and Michael Breen, Apex, N.C., have developed a patent (8,238,632) for an imaging system.

The abstract of the patent published by the U.S. Patent and Trademark Office states: "Systems, methods, media, and other embodiments associated with episcopic, histological, autoradiographic, and/or other imaging are described. One exemplary system includes a cryomicrotome, an episcopic imaging device and a histological imaging device, logic for registering episcopic images with histological images, and logic for manipulating images acquired from the episcopic imaging device and the histological imaging device."

The patent application was filed on Oct. 7, 2010 (12/924,894). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=8,238,632&OS=8,238,632&RS=8,238,632

Written by Satyaban Rath; edited by Hemanta Panigrahi.

* * *

North Carolina Inventor Develops Patent for System and Method for Generating Transaction Based Recommendations

ALEXANDRIA, Va., Aug. 14 -- Frank Duane Lortscher Jr., Penland, N.C.,has developed a patent (8,239,310) for a "system and method for generating transaction based recommendations."

The abstract of the patent published by the U.S. Patent and Trademark Office states: "A system for generating recommendation data includes an assessment unit and an evaluation unit. The assessment unit is configured to receive transaction data for a plurality of transactions and to assess each transaction and generate assessment data based thereon. The evaluation unit is coupled with the assessment unit and configured to receive an evaluation request including a proposed transaction, and generate recommendation data including a certainty indicator which indicates a level of certainty that the proposed transaction will be successful according to predetermined criteria."

The patent application was filed on May 13, 2010 (12/779,146). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=8,239,310&OS=8,239,310&RS=8,239,310

Written by Satyaban Rath; edited by Hemanta Panigrahi.

* * *

Ericsson Assigned Patent

ALEXANDRIA, Va., Aug. 14 -- Ericsson, Stockholm, Sweden, has been Assigned a patent (8,238,303) developed by Kambiz Zangi, Chapel Hill, N.C., Erik Dahlman, Bromma, Sweden, and Dennis Hui, Cary, N.C., for "method and apparatus of allocating subcarriers in an orthogonal frequency division multiplexing system."

The abstract of the patent published by the U.S. Patent and Trademark Office states: "The present invention provides a method of generating mutually orthogonal reference signals for different user terminals in and OFDM system that span different but overlapping subcarriers. The subcarriers allocated to the user terminals are divided into a plurality of non-overlapping subcarrier blocks. Each user terminal is then allocated one or more subcarrier blocks. For each subcarrier block, a user terminal is Assigned a reference signal comprising a base reference sequence and a linear phase rotation. To ensure mutual orthogonality among all user terminals, user terminals allocated the same subcarrier block use the same base reference sequence with different linear phase rotations."

The patent application was filed on Nov. 26, 2008 (12/324,073). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=8,238,303&OS=8,238,303&RS=8,238,303

Written by Satyaban Rath; edited by Hemanta Panigrahi.

* * *

North Carolina Inventor Develops Patent for Simulation Methods and Systems for Carriers Having Multiplications

ALEXANDRIA, Va , Aug. 14 -- Feng Ma, Cary, N.C., has developed a patent (8,239,176) for "simulation methods and systems for carriers having multiplications."

The abstract of the patent published by the U.S. Patent and Trademark Office states: "A simulation of a multiplication process includes tracing histories of a plurality of carriers, increasing a weight factor of a carrier to simulate a multiplication of the carrier, and summing the number of the plurality of carriers. Each of the plurality of carriers is multiplied by its respective weight factor."

The patent application was filed on Feb. 13, 2009 (12/371,574). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=8,239,176&OS=8,239,176&RS=8,239,176

Written by Satyaban Rath; edited by Hemanta Panigrahi.

***

Ericsson Assigned Patent for Detecting the Presence of Coding Scheme CS-1 RLC/MAC Control Message

ALEXANDRIA, Va., Aug. 14 -- Ericsson, Stockholm, Sweden, has been Assigned a patent (8,238,276) developed by John Diachina, Garner, N.C., and Stefan Eriksson, Hasselby, Sweden, for a "detecting the presence of coding scheme CS-1 RLC/MAC control message."

The abstract of the patent published by the U.S. Patent and Trademark Office states: "A method of transmitting a downlink, coding scheme CS-1 RLC/MAC control message from a BSS to an EGPRS MS (61), and receiving and detecting the CS-1 RLC/MAC control message in the MS. The BSS places in an MCS-1 radio block, a CS-1 RLC/MAC control block identical to a coding scheme CS-1 RLC/MAC control message excluding the MAC header octet. The BSS also places a coding scheme CS-4 stealing bit code word in the radio block using legacy stealing bit values and positions. The CPS field (26) of the block header (25) indicates that the radio block contains a CS-1 RLC/MAC control message. The MS receives the radio block and detects the coding scheme CS-4 stealing bit code word. In response, the MS interprets the received radio block header to identify the CPS field. The MS determines from the CPS field that a CS-1 RLC/MAC control block has been received."

The patent application was filed on March 7, 2008 (12/531,224). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=8,238,276&OS=8,238,276&RS=8,238,276

Written by Satyaban Rath; edited by Hemanta Panigrahi.

***

North Carolina Inventor Develops Patent for Imaging System and Method Utilizing Primary Radiation

ALEXANDRIA, Va., Aug. 14 -- Feng Ma, Morrisville, N.C., has developed a patent (8,238,513) for an "imaging system and method utilizing primary radiation."

The abstract of the patent published by the U.S. Patent and Trademark Office states: "An imaging system and method for producing an image based on primary radiation. A separate image based solely on scattered radiation may also be obtained and may be of practical interests. The separation of primary and scattered radiation is achieved by utilizing a small beam exposure and a cone beam exposure, then the primary and scatter images are reconstructed based on a pencil beam model or from a Monte Carlo method. Other embodiments disclosed include two-layer detector arrays or volumetric detector arrays that measure the relationship between the dose and the position, from which the primary and scattered radiation can be extracted. In addition, by limiting a readout time of a detector, primary radiation component may be read because of a delay in the scattered radiation."

The patent application was filed on Sept. 19, 2006 (12/067,383). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=8,238,513&OS=8,238,513&RS=8,238,513

Written by Satyaban Rath; edited by Hemanta Panigrahi.

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North Carolina Inventor Develops Patent for High-speed Actuator for Valves

ALEXANDRIA, Va., Aug. 14 -- Robert O. Brandt Jr., Wilmington, N.C., has developed a patent (8,235,252) for a "high-speed actuator for valves."

The abstract of the patent published by the U.S. Patent and Trademark Office states: "A high-speed actuator moves a valve stopper to a selected position to control material flow. The actuator includes a rod carrying first and second axially spaced solenoid armatures attached to the stopper. First and second solenoid coil surround and are spaced from the rod to bias the first solenoid armature along with the rod and valve stopper. A linear variable differential transformer (LVDT) responsive to the position of the second armature determines the instantaneous position of the valve stopper. A valve position control circuit receives a valve position set point from a user's input, and a valve position feedback signal from the LVDT. The valve position control circuit includes first and second solenoid coil drive signals that urge the first armature and stopper to the valve position set point. A signal generator circuit vibrates the valve about a set point to enhance material discharge."

The patent application was filed on Oct. 14, 2008 (12/287,814). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=8,235,252&OS=8,235,252&RS=8,235,252

Written by Arpi Sharma; edited by Anand Kumar.

***

North Carolina Inventor Develops Patent for Locking Mechanism for an Ice Skate Blade

ALEXANDRIA, Va., Aug. 14 -- Wally Wayne Tatomir, Raleigh, N.C., has developed a patent (8,235,399) for "locking mechanism for an ice skate blade."

The abstract of the patent published by the U.S. Patent and Trademark Office states: "An ice skate blade for an ice skate is sized to fit into a holder attached to the sole of the ice skate. The ice skate blade has a pair of tabs that extend into the holder to secure the blade to the holder. A first tab

includes a through hole that receives a mechanical fastener that secures the blade to the holder. The second tab includes a lock that contacts the interior of the holder to prevent the skate blade from moving within the holder."

The patent application was filed on Jan. 14, 2010 (12/687,556). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=8,235,399&OS=8,235,399&RS=8,235,399

Written by Arpi Sharma; edited by Anand Kumar.

* * *

North Carolina Inventor Develops Patent for Electrolysis Prevention Device and Method of Use

ALEXANDRIA, Va., Aug. 14 -- Frank Petrosino, Concord, N.C., has developed a patent (**8,236,145**) for an "electrolysis prevention device and method of use."

The abstract of the patent published by the U.S. Patent and Trademark Office states: "An electrolysis prevention device, for preventing corrosion caused by electrolysis, includes a sacrificial anode made of an active metal and an anode holder supporting the sacrificial anode. The holder is adapted to fit around the inlet connection of an engine heat exchange component, such as a radiator or heater core, in such a way as to allow for a hose to be attached overtop the device. The device may be included in an originally-manufactured engine heat exchange component or may be installed later."

The patent application was filed on Dec. 7, 2009 (12/631,903). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=**8,236,145**.PN.&OS=PN/**8,236,145**&RS=PN/**8,236,145**

Written by Kusum Sangma; edited by Anand Kumar.

* * *

North Carolina Inventor Develops Patent for Method of Treating Pruritis

ALEXANDRIA, Va., Aug. 14 -- Santea B. Griffin, Durham, N.C., has developed a patent (8,235,929) for a "method of treating pruritis."

The abstract of the patent published by the U.S. Patent and Trademark Office states: " he present invention relates to a method of treating dermatologic pruritis. The skin involved with purities is covered with an organic cloth in order to make it more difficult to scratch. The contact of the organic cloth not only makes it difficult to scratch but adds a soothing feel thus lessening the tendency to need to scratch."

The patent application was filed on July 9, 2009 (12/500,275). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=8,235,929.PN.&OS=PN/8,235,929&RS=PN/8,235,929

Written by Kusum Sangma; edited by Anand Kumar.

* * *

North Carolina Inventor Develops Patent for Method of Making an Engraved Scannable Marking Code

ALEXANDRIA, Va., Aug. 14 -- Kenneth E. Conley, Matthews, N.C., has developed a patent (8,236,209) for a "method of making an engraved scannable marking code."

The abstract of the patent published by the U.S. Patent and Trademark Office states: "An engraved scannable marking code produced by providing a substrate of transparent material having a first side and a second side and an index of refraction greater than one; and forming a plurality of lenses on the first side of the substrate in pre-selected portions thereof, wherein the plurality of lenses and selected reminder portions form a desired marking code pattern operable for being read by a code reading apparatus."

The patent application was filed on April 18, 2006 (11/406,145). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=8,236,209.PN.&OS=PN/8,236,209&RS=PN/8,236,209

Written by Kusum Sangma; edited by Anand Kumar.

* * *

Syngenta Participations Assigned Patent

ALEXANDRIA, Va., Aug. 14 -- Syngenta Participations, Basel, Switzerland, has been assigned a patent (8,237,020) developed by five co-inventors for an "expression and use of novel pesticidal toxins." The co-inventors are Paul Miles, Research Triangle Park, N.C., Vance Kramer, Research Triangle Park N.C., Shen Zhicheng, Morrisville, N.C., Gregory Warren, Research Triangle Park, N.C., and Frank Shotkoski, Cary, N.C.

The abstract of the patent published by the U.S. Patent and Trademark Office states: "A novel pesticidal toxin that is highly active against a wide range of lepidopteran insect pests is disclosed. The DNA encoding the pesticidal toxin can be used to transform various prokaryotic and eukaryotic organisms to express the pesticidal toxin. These recombinant organisms can be used to control lepidopteran insects in various environments."

The patent application was filed on Oct. 1, 2009 (12/571,470). The full-text of the patent can be found at http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=8,237,020.PN.&OS=PN/8,237,020&RS=PN/8,237,020

Written by Kusum Sangma; edited by Anand Kumar.

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North Carolina Inventor Develops Patent for Electrolysis Prevention Device and Method of

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DATELINE: Alexandria, Va.

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ALEXANDRIA, Va., Aug. 14 -- Frank Petrosino, Concord, N.C., has developed a patent (**8,236,145**) for an "electroly

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Written by Kusum Sangma; edited by Anand Kumar.

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14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000	7313

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EXAMINER
VINCENT, SEAN E

ART UNIT	PAPER NUMBER
3991	

NOTIFICATION DATE	DELIVERY MODE
06/29/2015	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):

IPTLdocket@velaw.com
tcorder@velaw.com
bmelder@velaw.com

Office Action Summary	Application No. 14/452,339	Applicant(s) PETROSINO, FRANK	
	Examiner SEAN E. VINCENT	Art Unit 3991	AIA (First Inventor to File) Status No

-- 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 MONTHS 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 _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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) 1-31 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) 1-31 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 8-5-14 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).

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)).

** 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/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application is being examined under the pre-AIA first to invent provisions.

Reissue Applications

For reissue applications filed before September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the law and rules in effect on September 15, 2012. Where specifically designated, these are "pre-AIA" provisions.

For reissue applications filed on or after September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the current provisions.

Priority

US Patent 8,236,145 (hereafter referred to as "The '145 Patent") claimed priority to US Provisional application No. 61/120,296 filed on Dec. 5, 2008. The specification submitted in the instant reissue application states this claim in col. 1, lines 7-11. However, the claim for domestic priority benefit must be repeated in the reissue application. The Application Data Sheet filed August 8, 2014 lacks the specific reference to the provisional application in the Domestic Benefit/National Stage Information. The claim for priority must be included in an Application Data Sheet.

Status of the Claims

Original claims 1-14 from the '145 Patent are presented.

New claims 15-31 are proposed to be added by present reissue.

Reissue Declaration

The reissue oath/declaration filed with this application is defective because it fails to identify at least one error which is relied upon to support the reissue application. See 37 CFR 1.175 and MPEP § 1414. 37 CFR 1.175 states that the declaration must "**specifically** identify at least one error pursuant to 35 U.S.C. 251." MPEP 1414 (II) C further states the following:

> It is not sufficient for an oath/declaration to merely state "this application is being filed to correct errors in the patent which may be noted from the changes made in the disclosure." Rather, the oath/declaration must specifically identify an error. In addition, it is not sufficient to merely reproduce the claims with brackets and underlining and state that such will identify the error. See *In re Constant,* 827 F.2d 728, 729, 3 USPQ2d 1479 (Fed. Cir.), *cert. denied,* 484 U.S. 894 (1987). **Any error in the claims must be identified by reference to the specific claim(s) and the specific claim language wherein lies the error.**
>
> (Emphasis added)

The declaration states the belief that the patentee claimed more or less than he had the right to claim in the patent. No further explanation is offered.

The reissue oath/declaration filed with this application ***is further defective*** (see 37 CFR 1.175 and MPEP § 1414) because of the following:

The declaration fails to identify at least one broadened claim. Note that claim 23 is broader than claim 10 because it lacks the structure of an anode holder supporting the sacrificial anode wherein the holder is adapted to fit around the inlet connection of

an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

The reissue oath/declaration filed with this application ***is further defective*** because the error which is relied upon to support the reissue application is not an error upon which a reissue can be based. See 37 CFR 1.175 and MPEP § 1414. As explained above, no clear error statement is found in the reissue declaration. The implied error in claims 1 and 13 is that it claimed less than the patentee was entitled to claim. Upon review of new claims 23-31, they are found to contain improperly recaptured subject matter.

Claim 23 does not contain the anode holder which was argued on February 29, 2012 in the US Application no. 12/631903 to define the later allowed claims over the prior art. In the three step test for recapture set forth in MPEP 1412.02, new claim 23 is found to be broader (STEP ONE) than patent claim 10 in at least one aspect relating to surrendered subject matter (i.e. “anode holder”) in US Application no. 12/631903 from which the ‘145 Patent later issued (STEP TWO). Claim 23 requires that the sacrificial anode is disposed within 10 inches of the center of the inlet which is narrower than claim 10’s "in proximity to an inlet connection thereof". However, "within 10 inches" is not a substitute limitation that was overlooked in the original application. Canceled claim 14 from the 12/631903 application attached the sacrificial anode to the heat exchange component of claim 12 within 10 inches of a center of the inlet connection. (STEP THREE). Therefore, claim 23 contains improperly recaptured subject matter. Where patentee appears to rely on the implied error that patent claim 10 was too narrow

and newly proposed claim 23 attempts to correct the error, the error relied upon is not a proper basis for a reissue application. See MPEP 1412.02.

Claim Rejections - 35 USC § 251

Claims 1-31 are rejected as being based upon a defective reissue declaration under 35 U.S.C. 251 as set forth above. See 37 CFR 1.175.

The nature of the defect(s) in the declaration is set forth in the discussion above in this Office action.

Claims 20-31 are rejected under 35 U.S.C. 251 as being an improper recapture of broadened claimed subject matter surrendered in the application for the patent upon which the present reissue is based. See *Greenliant Systems, Inc. et al v. Xicor LLC*, 692 F.3d 1261, 103 USPQ2d 1951 (Fed. Cir. 2012); *In re Shahram Mostafazadeh and Joseph O. Smith*, 643 F.3d 1353, 98 USPQ2d 1639 (Fed. Cir. 2011); *North American Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335, 75 USPQ2d 1545 (Fed. Cir. 2005); *Pannu v. Storz Instruments Inc.*, 258 F.3d 1366, 59 USPQ2d 1597 (Fed. Cir. 2001); *Hester Industries, Inc. v. Stein, Inc.*, 142 F.3d 1472, 46 USPQ2d 1641 (Fed. Cir. 1998); *In re Clement*, 131 F.3d 1464, 45 USPQ2d 1161 (Fed. Cir. 1997); *Ball Corp. v. United States*, 729 F.2d 1429, 1436, 221 USPQ 289, 295 (Fed. Cir. 1984). A broadening aspect is present in the reissue which was not present in the application for patent. The record of the application for the patent shows that the broadening aspect (in the reissue) relates to claimed subject matter that applicant

previously surrendered during the prosecution of the application. Accordingly, the narrow scope of the claims in the patent was not an error within the meaning of 35 U.S.C. 251, and the broader scope of claim subject matter surrendered in the application for the patent cannot be recaptured by the filing of the present reissue application.

With regard to claim 20, the claimed method lacks provision for an anode holder as argued by applicant in US Application no. 12/631903 to define over the prior art. This makes claim 20 broader in an aspect related to surrendered subject matter. Claim 20 requires that the sacrificial anode is disposed within 10 inches of the center of the inlet which makes it is equal in scope to canceled claim 14 from US Application no. 12/631903. Therefore, claim 20 contains improperly recaptured subject matter.

As outlined in the above objection to the declaration, claim 23 is directed to a radiator which is broader than the radiator of patented claim 10 in the aspect of a provision for an anode holder. Applicant argued that the anode holder defined the patented claims over the prior art containing no anode holder and claim 10 was previously amended to contain the electrolysis prevention device of claim 1 containing the anode holder. Claim 23 is narrower in the aspect of requiring that the sacrificial anode is disposed within 10 inches of the center of the inlet. However, as discussed above, this is not an equivalent substitute (i.e. replacement) limitation that was overlooked in US Application no. 12/631903. It was a limitation of canceled claim 14. Therefore, claim 23 contains improperly recaptured subject matter.

With regard to claims 21, 22 and 24-31, further limitations added by the new dependent claims do not limit the claims in an anode holder aspect but their limitations were present in patented and canceled claims. Therefore, the narrowing limitations were never overlooked and the claims contain improperly recaptured subject matter.

Specification

The disclosure is objected to because of the following informalities:

Col. 6, lines 19-22 of the '145 patent refer to inlet fitting 16. The rest of the patent refers to inlet connection 16. The reference number appears to be pointed to the same structure in the drawings, but is named inconsistently in the specification. The specification should be amended to change any references of "inlet fitting 16" to "inlet connection 16".

Claim Construction

All of the independent claims 1, 12, 13, 20 and 23 require a heat exchange component having an inlet. The '145 Patent notes in col. 5, lines 39-47 that the meaning of each term used therein should be given the meaning understood by the Ordinary Artisan. In col. 6, lines 1-3, "engine heat exchange component" is stated to refer to an engine radiator, heater core or other device for exchanging heat in an engine. In col. 6, lines 52-55, the '145 Patent says: "The specific inlet connection 16 varies by vehicle make, model and model year, but the inlet 17 is generally understood to refer to the vicinity of where hot water coming directly from the engine enters into the

radiator 11." Therefore, the term "engine heat exchange component" will be considered synonymous with "radiator" and "inlet" will be interpreted **as the vicinity of the heat exchange component where hot water enters**. "Inlet" and "Inlet connection" will be interpreted differently in that the connection is a specific structure while the inlet is the vicinity of the inlet connection.

Col. 6, lines 55-58 of the '145 Patent state: "The radiator 11 may include a fill cap 39 as shown in FIG. 1C but is understood to be optional and is not present on many radiators 39." FIG. 1C shows an anode holder 12 directly adjacent to the inlet 17 but also shows a fill cap 39 in the vicinity of the inlet. The discussion of crossflow vs. downflow radiator types in col. 6, lines 10-45 lacks a mention of the fill cap 39, but the figures appear to illustrate that downflow radiators locate the inlet connection and the fill cap on the upper side of the radiator. The figures are inconsistent in the labeling of the inlet 17 or the inlet connection 16 or both. Therefore, "inlet connection" and "fill cap" will be interpreted as separate structures because a fill cap or the opening into which a fill cap enters would not permit hot water to enter a radiator. Furthermore, the inlet connection and fill cap would have to be adjacent to each other for an anode holder or anode assembly located in the fill cap to be adjacent the inlet connection. However, since the inlet is not a structure but a vicinity, the fill cap would only need to be in the same vicinity as the inlet connection for the fill cap to be adjacent the inlet. .

Claim Rejections - 35 USC § 112

> The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-11, 13 and 14 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

The claims refer to an “inlet connection”. Inlet connection 16 is discussed throughout the specification, but anode support 19 is described as being doubled back around the **inlet fitting 16** in col. 6, lines 19-22. Inconsistent reference numbers in the specification cause the scope of the claims to be undetermined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of pre-AIA 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 –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12 and 15-22 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Green (US 5,649,581).

Green teaches a method of preventing corrosion of a radiator 30 wherein a sacrificial anode 26 is installed in the radiator cap 10 which is placed on a radiator

opening (see abstract, figs. 2 and 3, col. 2, lines 14-51). With regard to claim 12, Green only discloses one inlet which is the opening into which the radiator cap and the sacrificial anode are placed. Green appears to illustrate a downflow type radiator in figure 3. Based on the claim construction outlined above, the ordinary artisan would understand that the radiator cap is adjacent an inlet and therefore the anode assembly is adjacent an inlet.

With regard to claim 15, a radiator is clearly disclosed by Green.

With regard to claims 16 and 17, Green specifically teaches sacrificial anodes of zinc, magnesium or aluminum alloy in col. 2, lines 40-44.

With regard to claim 18, various detachable securing devices such as snaps and screw assemblies are taught to be known in the art for installing the anode into the radiator cap (col. 2, lines 61-63). A screw assembly would necessarily utilize a fitting hole and such a hole would have been adjacent the inlet opening of Green.

With regard to claim 19, Green states that the generation of electrical current by the anode protects the radiator (col. 2, lines 34-51). Such electrical current would necessarily involve grounding the anode to the vehicle in which the radiator is being used.

With regard to claim 20, Green anticipates the claimed method for the same reasons as in the rejection of claim 12. Since the inlet is the vicinity of the heat exchange component where hot water enters, the ordinary artisan would have understood Green's anode assembly to be within ten inches of the center of this vicinity.

With regard to claim 21, a radiator is clearly disclosed by Green.

With regard to claim 22, the problem of electrolytic activity in the presence of aluminum components are discussed by Green in col. 1, lines 33-39 and sacrificial anodes are discussed for solving the problem in col. 1, lines 46-52.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 23-31 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Green in view of Gush (US 1,514,903).

Green teaches a radiator 30 wherein having a sacrificial anode 26 is installed in the radiator cap 10 which is placed on a radiator opening (see abstract, figs. 2 and 3, col. 2, lines 14-51). Green only discloses one inlet which is the opening into which the radiator cap and the sacrificial anode are placed. Green appears to illustrate a downflow type radiator in figure 3. Based on the claim construction outlined above, the ordinary artisan would understand that the radiator cap is adjacent an inlet and therefore the anode assembly is adjacent an inlet. Green does not teach that the sacrificial anode is within inches of the center of the inlet.

Gush teaches a radiator having an anticorrosion electrode bar extending across the top of the radiator (see figures 1-3 and page 1, lines 90-104 and page 2, lines 35-

44). Gush also teaches the application of an anticorrosion electrode to a cooling water manifold (page 2, lines 20-29). While Green never specifies the location of an inlet, a downflow type of radiator for motor vehicles has been well known for a long time as shown by Gush. The top (“L") of a downflow radiator or the cooling water manifold (“O”) through which hot water was known to flow from an engine into a radiator is taught by Gush to contain anticorrosion electrodes at their centers. The electrodes of Gush are effectively located at the center of the inlet. With regard to claim 23, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to configure the radiator of Green as demonstrated by Gush because Gush was successfully protecting radiators with anticorrosion electrodes long before Green.

With regard to claim 24, Gush's electrodes are adjacent the inlet.

With regard to claim 25, Gush states that suitable apertures can be made in the water jackets or radiators of internal combustion engines and electrodes are inserted into closures for the apertures.

With regard to claims 26 and 27, the electrode of Green is installed onto the interior surface of a radiator cap. Based on the claim construction discussed earlier, that radiator cap would have been understood by an ordinary artisan to be located within ten inches of the center of the inlet vicinity and/or adjacent that inlet vicinity.

With regard to claims 28 and 29, the electrode of Green can be an active metal such as zinc, magnesium, aluminum alloy or combinations thereof (col. 2, lines 38-44).

With regard to claim 30, Green states that the generation of electrical current by the anode protects the radiator (col. 2, lines 34-51). Such electrical current would

necessarily involve grounding the anode to the vehicle in which the radiator is being used.

With regard to claim 31, the problem of electrolytic activity in the presence of aluminum components are discussed by Green in col. 1, lines 33-39 and sacrificial anodes are discussed for solving the problem in col. 1, lines 46-52.

Conclusion

Claims 1-31 are rejected.

Applicant is reminded of the continuing obligation under 37 CFR 1.178(b), to timely apprise the Office of any prior or concurrent proceeding in which Patent No. 8,236,145 is or was involved. These proceedings would include interferences, reissues, reexaminations, and litigation.

Applicant is further reminded of the continuing obligation under 37 CFR 1.56, to timely apprise the Office of any information which is material to patentability of the claims under consideration in this reissue application.

These obligations rest with each individual associated with the filing and prosecution of this application for reissue. See also MPEP §§ 1404, 1442.01 and 1442.04.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN E. VINCENT whose telephone number is (571)272-1194. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Speer can be reached on (571) 272-8385. 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.

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Notice of References Cited	Application/Control No. 14/452,339	Applicant(s)/Patent Under Reexamination PETROSINO, FRANK	
	Examiner SEAN E. VINCENT	Art Unit 3991	Page 1 of 1

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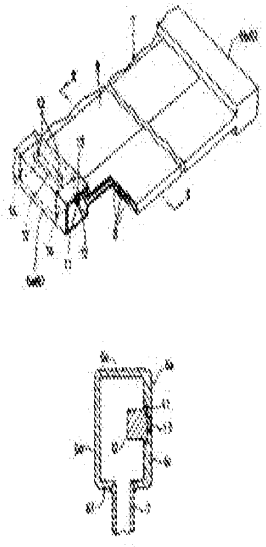
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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(71)Applicant : NIPPON LIGHT METAL CO LTD
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KAWAKITA KOJI



(54)HEAT EXCHANGER MADE OF ALUMINUM

(57)Abstract

PURPOSE: To solve problems of corrosion, and to improve durability of the title heat exchanger by providing a sacrifice anode made of a metal less noble than aluminum, which drops the electric potential of a pipe passage lower than the level of its pitting potential, on the inner wall of the pipe passage forming a brine flow path.

CONSTITUTION: On the inner wall of a pipe passage forming the brine flow path of a heat exchanger made of aluminum, which uses a brine consisting of an aqueous calcium chloride solution or an aqueous sodium chloride solution, is provided a sacrifice anode which is made of a metal less noble than aluminum and which drops the electric potential of the pipe passage by 50mV or more from the level of its pitting potential. Constituent substances for the anode electrode that meets such requirements may include zinc(Zn), magnesium(Mg) or an alloy of these metals, such as, for example, an alloy of Al-Zn-In-others. As for the amount of the sacrifice anode to be used, in the case where it is made of an aluminum alloy, an area ratio (anode/cathode area ratio) of the heat exchanger to the inner wall of the pipe passage is preferably 1:20W1:100.

⑲日本国特許庁（JP）　⑪特許出願公開

⑫公開特許公報（A）　平1－217196

⑤Int. Cl.⁴　識別記号　庁内整理番号　⑬公開　平成1年(1989)8月30日
F 28 F 19/00　7380－3L

審査請求　未請求　請求項の数 3　（全9頁）

⑭発明の名称　アルミニウム製熱交換器

⑳特　願　昭63－40880
㉒出　願　昭63(1988)2月25日

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明　細　書

1．発明の名称

アルミニウム製熱交換器

2．特許請求の範囲

(1) 塩化カルシウム又は塩化ナトリウム水溶液からなるブラインを使用するアルミニウム製の熱交換器であり、そのブライン流路を形成する管路内壁には、アルミニウムより卑な金属で形成され、この管路の電位をその孔食電位より50mV以上引下げる犠牲陽極を取付けたことを特徴とするアルミニウム製熱交換器。

(2) 塩化カルシウム又は塩化ナトリウム水溶液からなるブラインを使用するアルミニウム製の熱交換器であり、そのブライン流路を形成する管路内壁には、この管路を形成するアルミニウムより卑な金属で形成され、管路内壁の単位面積当りアルミニウム合金製の場合は0．003～0．486g／cm²の、亜鉛製の場合は0．008～1．296g／cm²の、また、マグネシウム製の場合は0．002～0．306g／cm²の重量を有する犠牲陽極を取付け、これら管路と犠牲陽極との間を少くともその一部で溶着又は固着したことを特徴とするアルミニウム製熱交換器。

(3) 対をなすヘッダ管とこれらヘッダ管の間に架設されて熱交換領域を形成する多数の熱交換管とで構成され、塩化カルシウム又は塩化ナトリウム水溶液からなるブラインを使用するアルミニウム製の熱交換器において、そのブライン流路を形成するヘッダ管及び／又は熱交換管をアルミ型材で形成すると共に、そのいずれか一方又は双方の管内壁にはその軸方向に沿って延びる取付溝を形成し、この取付溝内に沿って犠牲陽極を配設すると共に、この犠牲陽極と管壁との間を少くともその一部で溶着又は固着したことを特徴とするアルミニウム製熱交換器。

3．発明の詳細な説明

［産業上の利用分野］

この発明は、塩化カルシウム又は塩化ナトリウム水溶液からなるブラインを使用するアルミニウム製の熱交換器に係り、特に耐蝕性に優れたアル

ミニウム製熱交換器に関する。

［従来の技術］

従来、アルミニウムあるいはアルミニウム合金で形成されたアルミニウム製熱交換器においては、腐蝕の問題があることから、一般にその冷媒としてフロンガス、アンモニアガス等が使用されており、これらの冷媒は冷凍サイクルの中で蒸発と凝縮を繰返して循環使用されている。しかしながら、フロンガスについては、近年その環境破壊の問題がクローズアップし、今後その規制が厳しくなる傾向にあり、また、アンモニアガスについては、それが何らかの原因でガス漏れを起したような場合、人体に対する毒性が問題になるほか、臭気や環境汚染、さらには爆発性等の問題もある。

また、このような目的で使用される冷媒としては、例えば、塩化カルシウム水溶液、塩化ナトリウム水溶液等のいわゆるブラインと称されるものが知られており、例えば塩化カルシウム水溶液の場合はその２９．９重量％水溶液（比重１．２８６）での共晶点が－５５℃と低く、しかも、無害で安価であることから工業用として広く使用されている。しかしながら、これらのブラインを冷媒として使用する場合、それが電解質であることから金属に対する腐蝕性が極めて高く、亜鉛メッキ処理を施した鋼製熱交換器の場合でもその寿命が最長５年であるというように、このブラインを使用する熱交換器の耐久性が重大な問題になる。

ところで、このような熱交換器が使用される種々の冷却機器においては、特にそのうちでも移動するもの、例えば船用冷蔵装置や冷蔵トラック等においては、その熱交換器をアルミニウムあるいはアルミニウム合金製にして軽量化することは、これによって軽量化した分だけ余分に荷積できるほか、また、燃費も改善されるので、極めて意義のあることである。

［発明が解決しようとする課題］

本発明者等は、かかる観点に鑑みて鋭意研究を重ねた結果、塩化カルシウム又は塩化ナトリウム水溶液からなるブラインを使用するアルミニウム製の熱交換器においてその腐蝕の問題を解決し、本発明を完成したものである。

従って、本発明の目的は、冷媒として環境汚染の問題や人体に対する毒性の問題がなく、無害で安価な塩化カルシウム又は塩化ナトリウム水溶液からなるブラインを使用することができ、しかも、耐久性に優れたアルミニウムあるいはアルミニウム合金で形成されたアルミニウム製熱交換器を提供することにある。

［課題を解決するための手段］

すなわち、本発明は、塩化カルシウム又は塩化ナトリウム水溶液からなるブラインを使用するアルミニウム製の熱交換器であり、そのブライン流路を形成する管路内壁には、アルミニウムより卑な金属で形成され、この管路の電位をその孔食電位より５０mV以上引下げる犠牲陽極を取付けたアルミニウム製熱交換器である。

本発明において、熱交換器の材質としては、純アルミニウム（1000系）や、Al－Mn系（3000系）、Al－Si系（4000系）、Al－Mg系（5000系）、Al－Cu－Mg系（2000系）、Al－Mg－Si系（6000系）、Al－Zn－Mg系（7000系）等の種々のアルミニウム合金系を使用できる。

また、冷媒として使用する塩化カルシウム水溶液や塩化ナトリウム水溶液についても、例えば２９．９重量％濃度の塩化カルシウム水溶液や５重量％濃度の塩化ナトリウム水溶液等、従来この種の目的で通常使用されているものである。このようなブラインは、通常そのpHが５～９．２の範囲である。例えば、塩化カルシウムブラインの場合、そのpH９．２を越えると活性溶解の領域になり、また、自然放置条件下ではph５以下には下りにくい。

そして、これらのブラインには、その腐蝕性を抑制する目的でブラインの種類等に応じ、例えば燐酸水素ナトリウム、亜鉛末、トリエタノールアミン等の従来公知の腐蝕抑制剤を添加してもよい。さらに、これらのブラインについては、好ましくは腐蝕抑制剤として添加量０．１～３０重量％、好ましくは２～５重量％のジエチレントリアミンを使用するのがよい。このジエチレントリアミン

の使用により、ブラインによるアルミニウム製熱交換器の腐蝕を大幅に軽減することができ、本発明の犠牲電極と併用使用することによりアルミニウム製熱交換器の耐久性が一段と向上し、その寿命が著しく改善される。

このように構成される本発明の熱交換器において、そのブライン流路を形成する管路の孔食電位は、本発明者等の測定によれば、使用する熱交換器の材質やブラインの種類、その他ブラインの温度、溶存酸素量、流速等の種々の環境条件によって異なるが、通常、－３５０～－１，４００mVの範囲内である。

従って、上記熱交換器のブライン流路を形成する管路内壁に取付ける犠牲陽極としては、理論的にはこの管路を構成するアルミニウムより卑な金属であって管路に防蝕電流を流すことができる金属であれば使用することができるが、上述したように実際上は管路の孔食電位がブラインの温度、溶存酸素量、流速等の環境条件によって影響されて微妙に変動するので、管路の電位をその孔食電位より５０mV以上、好ましくは１００mV以上引下げることができるものであるのがよい。このような条件を満たす陽極電極としては、具体的には亜鉛（Zn）やマグネシウム（Mg）あるいはこれ等の金属の合金、例えばAl－Zn－In－他の合金（日本軽金属㈱製商品名：NIKKANODE)等を挙げることができる。

そして、この犠牲陽極の使用量については、熱交換器の管路の材質や使用するブラインの種類等によって異なるが、この犠牲陽極がアルミニウム合金製の場合、熱交換器の管路内壁面積に対する面積比（陽極／陰極面積比）が１：１０～１：１４０、好ましくは１：２０～１：１００であり、かつ、この管路内壁の単位面積当り０．００３～０．４８６g／cm、好ましくは０．００６～０．１４７g／cmとするのがよい。犠牲陽極の使用量が陽極／陰極面積比１：１４０及び０．００３g／cmより少ないと、管路内壁電位を臨界孔食電位以下に引下げることができなくなるほか、熱交換器の耐久性を改善してその寿命の向上を図ること

が困難になり、反対に、陽極／陰極面積比１：１０及び０．４８６g／cmを越える使用は管路によって形成される熱交換器の充分なブライン流路を確保できなくなり、熱交換効率が低下する。なお、犠牲陽極が亜鉛製の場合にはその使用量は管路内壁の単位面積当り０．００８～１．２９６g／cmであり、また、犠牲陽極がマグネシウム製の場合にはその使用量は管路内壁の単位面積当り０．００２～０．３０６g／cmとするのがよい。

上記犠牲陽極を熱交換器の管路内壁に取付ける方法については、この犠牲陽極と管路内壁とが少くともその一部で溶着又は固着していればよいが、好ましくは、熱交換器を対をなすヘッダ管とこれらヘッダ管の間に架設されて熱交換領域を形成する多数の熱交換管とで構成し、そのブライン流路を形成するヘッダ管及び／又は熱交換管をアルミ型材で形成し、そのいずれか一方又は双方の管内壁にその軸方向に沿って延びる取付溝を形成し、この取付溝内に沿って犠牲陽極を配設し、この犠牲陽極とヘッダ管及び／又は熱交換管の管路内壁との間を少くともその一部で溶着又は固着するのがよい。このようにアルミ型材で形成されたヘッダ管及び／又は熱交換管の取付溝内に犠牲陽極を配設し溶着又は固着することにより、犠牲陽極の納まりが正確になり、また、ブライン流路の断面積が局部的に極端に大きくなったり小さくなるようなことがなく、エロージョン発生の虞がないほか、乱流により気泡が発生して熱交換効率が低下するという虞もない。

そして、このように管路内壁に取付けられる犠牲陽極の形状については、それが断面円形状、断面楕円形状、断面三角形状、断面四角形状、断面台形状、断面多角形状等の棒状体やブロック状体等、取付可能であればどのような形状でもよいが、好ましくは上記ヘッダ管及び／又は熱交換管の取付溝と同じ断面形状の嵌合部を有する棒状体がよい。また、犠牲陽極とヘッダ管及び／又は熱交換管の管路内壁との間を溶着又は固着する際には、ヘッダ管及び／又は熱交換管の外側からその管路内部の取付溝内に配設された犠牲陽極の一部又は

全部との間を例えばプラグ溶接、スポット溶接やシーム溶接、ボルト止め等の手段で溶着又は固着すればよい。

本発明のアルミニウム製熱交換器は、例えばエアクリーニング、エアコンディショニング、製氷業、ドライアイス、船用冷蔵、冷水塔、冷蔵庫、冷蔵トラック等のあらゆる分野の熱交換手段として使用することができる。

［作　用］

本発明のアルミニウム製熱交換器は、その冷媒として塩化カルシウム又は塩化ナトリウム水溶液からなるブラインを使用することにより、そのブライン流路を形成する管路に孔食電位が発生するが、この管路内壁に取付けた犠牲電極からこの管路に防蝕電流が流れ、これによってこの管路をその臨界孔食電位未満に引下げることにより、アルミニウム製の管路、すなわち熱交換器が防蝕される。

［実施例］

以下、試験例及び添付図面に示す実施例に基いて、本発明を具体的に説明する。

防蝕試験例１

被防蝕体として幅７０㎜×厚さ５㎜×長さ２，０００㎜の大きさのアルミニウム（6063）製試験片を使用し、また、犠牲陽極として直径１６㎜×長さ８０㎜の大きさで重さ４３．４１ｇのAl－Zn－In－他の合金（日本軽金属㈱製商品名：NIKKANODE)製のもの（被防蝕体表面積に対する面積比の陽極／陰極面積比１／７５、被防蝕体表面積の単位面積当り０．０１４５ｇ／㎠）を使用し、さらに、ブラインとしてpH９の29.9wt%-塩化カルシウム水溶液を使用し、第１図に示すように、１６０ℓ水槽１内に上記ブライン２の１３０ℓを入れ、このブライン２中に上記被防蝕体３とその一端に電気的に接続された犠牲陽極４とをこれらが完全にブライン２中に浸るように浸漬し、上記水槽１にセットしたポンプ５を使用してブラインの循環が１日当り１２０ℓ／min.の速度で８時間運転しその後１６時間休止するというサイクルでこのブライン２を循環させながら室温下（１８～３０℃）に１０１日間の防蝕試験を行い、分極測定による被防蝕体の孔食電位測定、犠牲陽極から２，０００㎜離れた地点（犠牲陽極が接続された端とは反対の端の地点）における被防蝕体の電位の経時変化測定、犠牲陽極の消耗速度、及び、被防蝕体の腐蝕状況の観察を行った。

これら測定及び観察の結果については、被防蝕体の孔食電位が－８３０mVであり、被防蝕体の電位は３日目以降１，１００～１，１３０mVの範囲で安定して上記孔食電位より約３００mV低い電位に安定しており、また、犠牲陽極の消耗速度はこの防蝕試験の前後における犠牲陽極の重量変化から０．０１７ｇ／㎠であり、さらに、被防蝕体には孔食等の腐蝕の発生が認められなかった。

防蝕試験例２

ブラインとして 5wt%-塩化ナトリウム水溶液を使用した以外は、上記試験例１と同様にして防蝕試験を行い、被防蝕体の孔食電位、犠牲陽極から２，０００㎜離れた地点における被防蝕体の電位の経時変化及び犠牲陽極の消耗速度をそれぞれ測定し、また、被防蝕体の腐蝕状況の観察を行った。

結果は、被防蝕体の孔食電位が－７２０mVであり、被防蝕体の電位は－１，１００～－１，１５０mVの範囲で安定して上記孔食電位より約４００mV低い電位に安定しており、また、犠牲陽極の消耗速度は０．０１２ｇ／㎠であり、さらに、被防蝕体には孔食等の腐蝕の発生が認められなかった。

比較試験例１

犠牲電極を使用しなかった以外は上記防蝕試験例１と全く同様にして腐蝕試験を行い、被防蝕体の腐蝕状態を調べた。結果は、試験開始後３日で孔食が始まり、６ケ月後には孔食の深さが１．７４７㎜に達し、アルミニウム製熱交換器においては何らの防蝕処置を施すことなくそのブラインとして29.9wt%-塩化カルシウム水溶液を使用することは困難であることが判明した。

実施例１

第2A図及び第2B図において、この発明の第一実施例に係るアルミニウム製熱交換器が示されている。この熱交換器は、互いに間隔をおいて平行に

配設された比較的径の太い一対のヘッダ管６（6a、6b）と、これらヘッダ管6a、6bの間を連結する熱交換管体７とで構成されており、上流側に位置する一次側ヘッダ管6aの両端には図示外の冷媒供給口及び冷媒排出口が設けられており、供給口から導入された冷媒は、ヘッダ管６及び熱交換管体７の各ブライン流路８を蛇行した後、排出口10に至るまでの間の熱交換領域で熱交換されるようになっている。この場合、熱交換管体７は、第2B図に示すように、アルミニウム合金押出型材製の熱交換用型材９を互いに嵌合連結した構造となっている。

この第一実施例において、そのヘッダ管６及び熱交換管体７はその材質が６０６３アルミニウム合金であり、冷媒としてのブラインが流れるブライン流路８を形成する上記ヘッダ管６及び熱交換管体７の管路はその内面積が約８㎖となるように設計されている。

そして、上記ヘッダ管６は、その一次側ヘッダ管6aを拡大して示す第３図に示すように、アルミ押出成形によって横断面矩形状に形成され、その後壁6cの板厚がその前壁6d、上壁6e及び下壁6fよりも厚肉に形成されていると共にその内面側には全長に亘って蟻溝状の取付溝11が形成されており、この取付溝11内に所定の寸法に押出成形された断面略矩形状棒状体のAl－Zn－In－他の合金（日本軽金属㈱製商品名：NIKKANODE)製犠牲陽極12が嵌着され、さらに所定の間隔、例えば３０㎝間隔をおいて少くとも１本の犠牲陽極12について５箇所の溶着点13でプラグ溶接されている。

この第一実施例において、上記犠牲陽極12は、そのブライン流路を形成する上記ヘッダ管６及び熱交換管体７の管路内面積に対するその面積比（陽極／陰極面積比）が１：２５であって、その管路内面積の単位面積当り０．０７２ｇ／㎠となる設計されている。

そして、上記一次側ヘッダ管6aには互いに隣接する熱交換用型材９の間を仕切る仕切り板14が設けられ、また、二次側ヘッダ管6bにも同様に仕切り板（図示せず）が設けられており、これによって上記供給口から一次側ヘッダ管6a内に入った冷媒は、熱交換管体７の各熱交換用型材９のブライン流路８を蛇行状に流れた後、再び一次側ヘッダ管6aに形成された排出口から外部に排出されるようになっている。

この第一実施例の熱交換器について、上記防蝕試験例１で使用したと同じ29.9wt%-塩化カルシウム水溶液をブラインとして使用し、実際に冷凍サイクルに組込んで稼働させ、この熱交換器の腐蝕の状態を経時的に観察した。結果は、１８０日経過後においても孔食等の腐蝕は全く認められなかった。

次に、第4A図及び第4B図は、各ヘッダ管６に形成する取付溝11及びこの取付溝11内に取付けられる犠牲陽極12の断面形状についての変形例を示すもので、第4A図の場合は取付溝11が幅広の蟻溝状に形成されていると共にこの取付溝11内に取付けられる犠牲陽極12が断面略台形状に形成されており、また、第4B図の場合は後壁6c及び前壁6dにそれぞれ突設された突条15と上壁6eとで蟻溝状の取付溝11が形成され、この取付溝11内に取付けられる犠牲陽極12が断面略長方形状に形成されている。さらに、第５図は亜鉛（Zn）又はマグネシウム（Mg）で形成された犠牲陽極12' の場合における取付構造の変形例を示すもので、ヘッダ管６の後壁6cを螺合貫通するボルト13a を外部で密封溶接13' し、そのねじ部に犠牲陽極12' を螺合固着して行う。

実施例２

第６図ないし第９図は、管棚と称される第二実施例に係るアルミニウム製熱交換器に係り、アルミ押出成形によって一対の断面円形状の熱交換管16c が一体に形成されている５本の熱交換管型材16a と、１本の断面円形状の熱交換管16c が一体に形成されている１本の熱交換管型材16b と、これら熱交換管型材16a 及び16b を互いに連結する複数の細長いフラット板17と、上記各熱交換管16c の各端部間を連通連結して一側に位置する熱交換管16c の一端の冷媒供給口18から図面上右から５本目に位置する熱交換管16c の一端の冷媒排出

口19に至るまでの連続して蛇行するブライン流路を形成する４本のU字形状ヘッダ管20a と、上記各熱交換管16c の各端部間を連通連結して他側に位置する熱交換管16c の一端の冷媒供給口18から図面上左から６本目に位置する熱交換管16c の一端の冷媒排出口19に至るまでの連続して蛇行するブライン流路を形成する５本のU字形状ヘッダ管20b とで構成されている。

この第二実施例において、各熱交換管型材16a 、16b に一体に形成された熱交換管16c には、第７図に示すように、その内部に蟻溝状の取付溝21が形成されており、その取付溝21内の端部側にはその内面に密着するような円弧状の犠牲陽極22が嵌合され、これに熱交換管16c と犠牲陽極22との間が溶着点23でプラグ溶接されている。また、上記各ヘッダ管20a 、20b についても、アルミ押出成形により内部に蟻溝状の取付溝24が形成されるように成形された型材をU字形状に彎曲して形成されており、その両端の直線部分に位置する取付溝24内に犠牲陽極22が嵌合され、さらに上記熱交換管16c と同様にこれらヘッダ管20a 、20b と犠牲陽極22との間が溶着点25でプラグ溶接されている。

そして、この第二実施例の犠牲陽極22は、そのブライン流路を形成する上記ヘッダ管20a 、20b 及び熱交換管16c の管路内面積に対するその面積比（陽極／陰極面積比）が１：３０～１：１００であって、その管路内面積の単位面積当り０．００３～０．４８g／cmとなる設計されている。

この第二実施例の場合においても、上記防蝕試験例１で使用したと同じ29.9wt%-塩化カルシウム水溶液をブラインとし、実際に冷凍サイクルに組込んで稼働させて腐蝕の状態を経時的に観察した結果は、第一実施例の場合と同様に、長期間に亘って孔食等の腐蝕が全く認められなかった。

なお、第１０図はこの第二実施例に係るヘッダ管20a 、20b の変形例を示すもので、上記第二実施例と同様に、アルミ押出成形により成形された型材をU字形状に彎曲してヘッダ管20a 、20b を形成する際に、その型材の略中央部取付溝24には予め所定長さの犠牲陽極22を嵌合し、これらヘッダ管20a 、20b と犠牲陽極22との間を溶着点25でプラグ溶接し、しかる後にその両端部を折曲げてU字形状に形成してなるものである。なお、この変形例の場合においても、必要により各ヘッダ管20a 、20b の両端の直線部分に位置する取付溝24内に犠牲陽極22を取付けることにより、管路内面積に対する犠牲陽極22の面積比（陽極／陰極面積比）を調節することができる。

実施例３

第１１図において、この発明の第三実施例に係るアルミニウム製熱交換器が示されている。この熱交換器は、互いに間隔をおいて平行に配設された比較的径の太い一対のヘッダ管26a 、26b と、これらヘッダ管26a 、26b の間を連結する１２本の熱交換管27と、互いに隣接する各熱交換管27の間に熱交換管27に対してほぼ直交状に配設される波形状の熱交換用フィン28とで構成されており、上方に位置する一次側ヘッダ管26a の一端には冷媒供給口29が設けられていると共に、下方に位置する二次側ヘッダ管26b の一端には冷媒排出口30が設けられ、供給口29から導入された冷媒は排出口30に至るまでの間の熱交換領域で熱交換されるようになっている。

この第三実施例において、ヘッダ管26a 、26b 及び熱交換管27はその材質が６０６３アルミニウム合金であり、冷媒としてのブラインが流れるブライン流路を形成する上記ヘッダ管26a 、26b 及び熱交換管27の管路はその内面積が上記実施例と同じ犠牲陽極との比率範囲内となるように設計されている。

そして、上記ヘッダ管26a 、26b は、アルミ押出成形によって横断面円形状に形成され、その内面側には全長に亘って蟻溝状の取付溝31が形成されており、この取付溝31内に所定の寸法に形成された上記実施例１と同様の犠牲陽極32が嵌着され、さらに所定の間隔、例えば３０cm間隔をおいて少くとも１本の犠牲陽極32について２箇所の溶着点でプラグ溶接されている。

この第三実施例の場合においても、上記防蝕試験例１で使用したと同じ29.9wt%-塩化カルシウム

水溶液をブラインとし、実際に冷凍サイクルに組込んで稼働させて腐蝕の状態を経時的に観察した結果は、第一実施例の場合と同様に、長期間に亘って孔食等の腐蝕が全く認められなかった。

［発明の効果］

本発明によれば、冷媒として環境汚染の問題や人体に対する毒性の問題がなく、無害で安価な塩化カルシウム又は塩化ナトリウム水溶液からなるブラインを使用する軽量で耐久性に優れ、寿命の長いアルミニウム製熱交換器を提供することができる。

4．図面の簡単な説明

第１図は各試験例で使用した試験装置の説明図、第2A図は本発明の第一実施例に係るアルミニウム製熱交換器の断面斜視図、第2B図は第2A図のⅡ－Ⅱ線断面図、第３図は第１図のヘッダ管の横断面図、第4A図及び第4B図はヘッダ管内に形成される取付溝及びこの取付溝に取付けられる犠牲陽極の変形例を示す第３図と同様の横断面図、第５図は他の材質の犠牲陽極に係る取付構造の変形例を示す第３図と同様の横断面図、第６図は第二実施例に係るアルミニウム製熱交換器の正面図、第７図は第６図のⅦ－Ⅶ線断面図、第８図は第６図のヘッダ管の部分断面正面図、第９図は第８図のⅨ－Ⅸ線断面図、第１０図はヘッダ管の変形例を示す第８図と同様の部分断面正面図、第１１図は第三実施例に係るアルミニウム製熱交換器を示す部分断面正面図である。

符号の説明

(2) …ブライン（29.9wt%-塩化カルシウム水溶液）、　(3) …被防蝕体、

(4)(12)(12')(22)(32)…犠牲陽極、

(6)(6a)(6b)(20a)(20b)(26a)(26b) …ヘッダ管、

(7) …熱交換管体、(8) …ブライン流路、

(16c)(27) …熱交換管、

(11)(21)(24)(31)…取付溝、

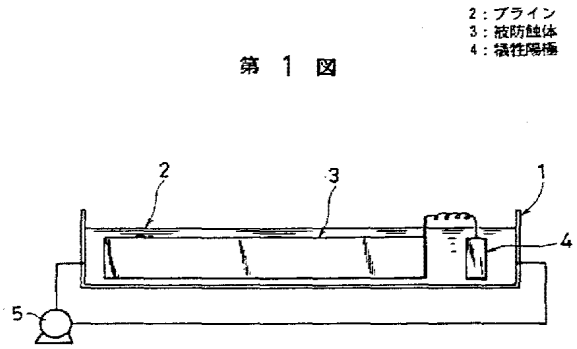
(13)(23)(25)…溶着点。

特許出願人　　日本軽金属株式会社

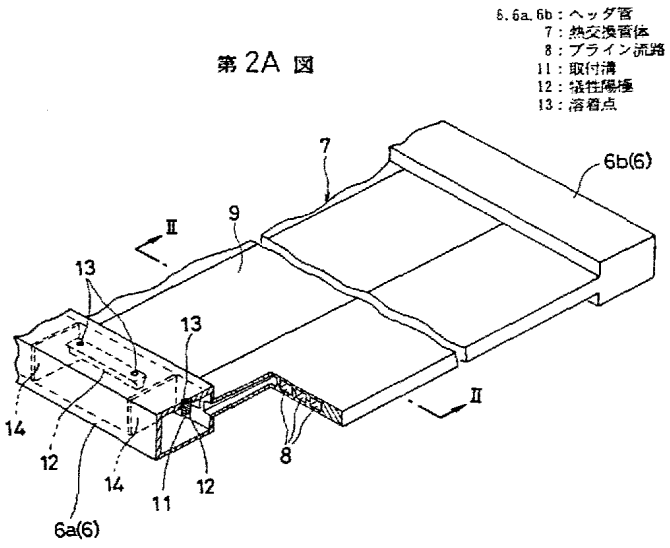
代　理　人　　弁理士　中　村　　智　廣

（外３名）

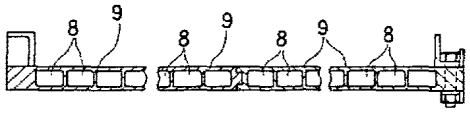
第 1 図



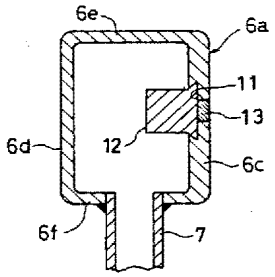
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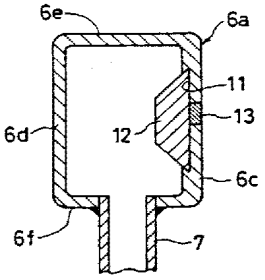
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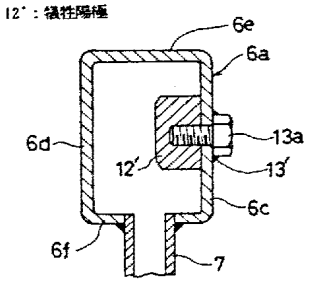
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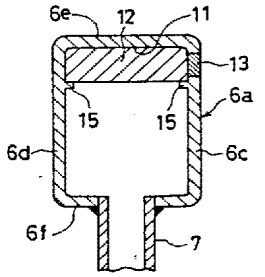
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第 5 図

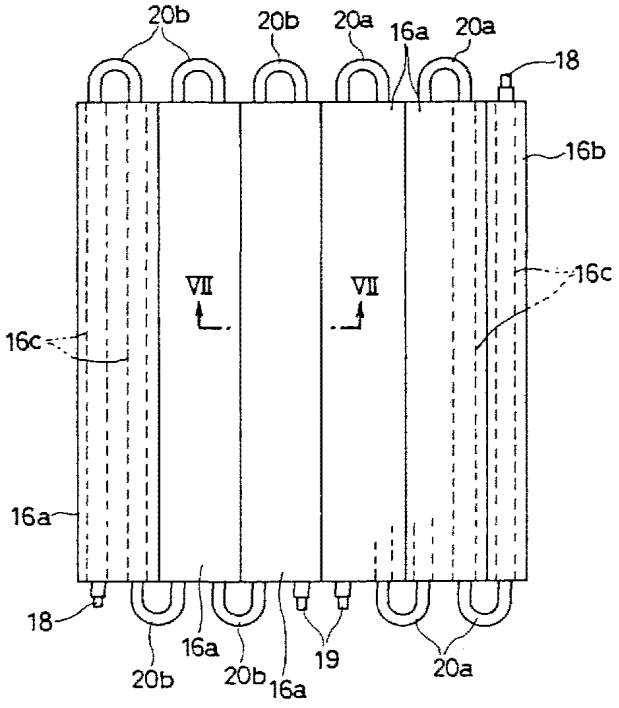


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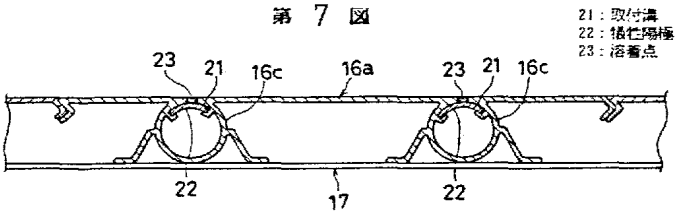


16c：熱交換管
20a, 20b：ヘッダ管

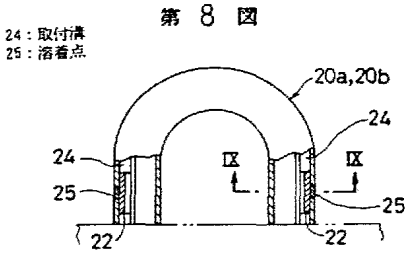
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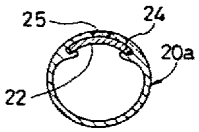
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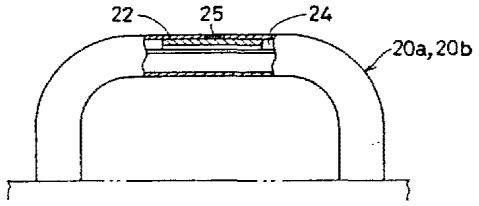
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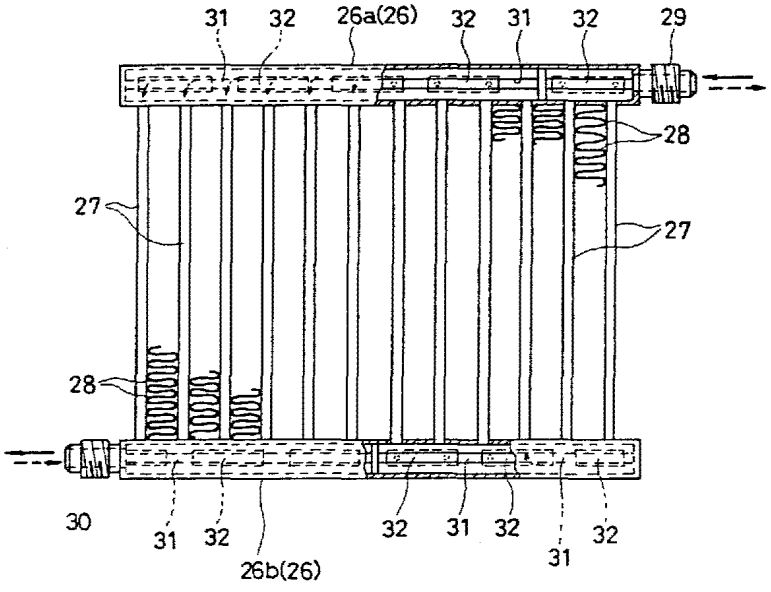
第 9 図



第 10 図



第 11 図



DERWENT-ACC-NO: 1989-295855

DERWENT-WEEK: 198941

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TITLE: Corrosion-resistant aluminium heat exchanger has sacrificial anode of metal baser than aluminium attached to inner wall of pipeline forming flow path of brine

INVENTOR: HANAZAKI M; KAWAKITA K

PATENT-ASSIGNEE: NIPPON LIGHT METAL CO[NIMI]

PRIORITY-DATA: 1988JP-040880 (February 25, 1988)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
JP 01217196 A	August 30, 1989	JA

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 01217196A	N/A	1988JP-040880	February 25, 1988

INT-CL-CURRENT:

TYPE	IPC DATE
CIPP	F28F19/00 20060101

ABSTRACTED-PUB-NO: JP 01217196 A

BASIC-ABSTRACT:

In an aluminium heat exchanger using a brine composed of calcium chloride or sodium chloride aq. soln., a sacrificial anode composed of a metal baser than aluminium and capable of lowering the potential of the aluminium pipe by 50 mV or more beyond its pitting potential is attached to the inner wall of the pipeline forming the flow path of the brine, by at least partly welding between the pipeline and the sacrificial anode. The sacrificial anode used has a wt. per unit area of 0.003-0.486 g/cm2 for aluminium alloy, 0.008-1.296 g/cm2 for zinc, and 0.002-0.306 g/cm2 for Mg.

USE/ADVANTAGE - The aluminium heat exchanger is used for air cleaning, air conditioning, refrigerator, etc., and has excellent corrosion resistance.

TITLE- CORROSION RESISTANCE ALUMINIUM HEAT EXCHANGE
TERMS: SACRIFICIAL ANODE METAL ATTACH INNER WALL PIPE FORMING FLOW PATH BRINE

DERWENT-CLASS: J08 M23 Q78

CPI-CODES: J07-A04; J08-D02; M14-E; M14-K;

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: 1989-130975
Non-CPI Secondary Accession Numbers: 1989-225447

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S2	2	("4776392" | "5649591").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/21 09:18
S4	106	(C23F13/18).CPC.	US-PGPUB; USPAT	OR	ON	2015/05/27 14:51
S5	10032657	@pd < "20081205"	US-PGPUB; USPAT	OR	ON	2015/05/27 14:52
S6	73	S4 and S5	US-PGPUB; USPAT	OR	ON	2015/05/27 14:52
S7	106	(C23F13/18).CPC.	US-PGPUB; USPAT	OR	ON	2015/05/28 13:18
S8	13	(radiator or (heat adj exchanger) or condenser) AND ((C23F13/005).CPC.)	US-PGPUB; USPAT	OR	ON	2015/05/28 13:22
S9	10032657	@pd < "20081205"	US-PGPUB; USPAT	OR	ON	2015/05/28 13:23
S10	73	S7 and S9	US-PGPUB; USPAT	OR	ON	2015/05/28 13:23
S11	13	S8 not S10	US-PGPUB; USPAT	OR	ON	2015/05/28 13:23
S12	3024	sacrificial near2 anode	US-PGPUB; USPAT; USOCR	OR	ON	2015/06/02 12:57
S13	492219	(radiator or (heat adj exchanger) or condenser)	US-PGPUB; USPAT	OR	ON	2015/06/02 12:58
S14	564	S12 and S13	US-PGPUB; USPAT	OR	ON	2015/06/02 12:58
S15	51117	tether	US-PGPUB; USPAT	OR	ON	2015/06/02 12:58
S16	8	S14 and S15	US-PGPUB; USPAT	OR	ON	2015/06/02 12:58
S17	51870	S13 near4 inlet	US-PGPUB; USPAT	OR	ON	2015/06/02 13:00
S18	79	S12 and S17	US-PGPUB; USPAT	OR	ON	2015/06/02 13:00
S19	3	S12 same S17	US-PGPUB; USPAT	OR	ON	2015/06/02 13:00
S20	1	"8236145".did.	US-PGPUB; USPAT	OR	ON	2015/06/02 16:10
S21	2763	sacrificial near2 anode	EPO; JPO; DERWENT	OR	ON	2015/06/10 10:46
S22	575835	(radiator or (heat adj exchanger) or condenser)	EPO; JPO; DERWENT	OR	ON	2015/06/10 10:46
S23	9938	tether	EPO; JPO; DERWENT	OR	ON	2015/06/10 10:46

S24	752	S21 and S22	EPO; JPO; DERWENT	OR	ON	2015/06/10 10:46
S25	0	S23 and S24	EPO; JPO; DERWENT	OR	ON	2015/06/10 10:46
S26	2615	S23 and (mount or mounting or plug or attach or install or hang or holder or fitting)	EPO; JPO; DERWENT	OR	ON	2015/06/10 10:51
S27	17	S24 and (mount or mounting or plug or attach or install or hang or holder or fitting)	EPO; JPO; DERWENT	OR	ON	2015/06/10 10:51

EAST Search History (Interference)

<This search history is empty>

6/15/2015 10:37:34 AM
C:\Users\svincent\Documents\EAST\Workspaces\14452339.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14452339	PETROSINO, FRANK
	Examiner	Art Unit
	SEAN E VINCENT	3991

CPC- SEARCHED		
Symbol	Date	Examiner
see EAST search history	6-10-15	SV

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
see EAST search history	6-10-15	SV

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 21586

Jun 29, 2015 05:30:18 AM

Dear PAIR Customer:

VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760
UNITED STATES

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Application	Document	Mailroom Date	Attorney Docket No.
14452339	CTNF	06/29/2015	PET744/4-001REUS/58000
	892	06/29/2015	PET744/4-001REUS/58000

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Frank Petrosino	Group Art Unit: 3991
Serial No.: 14/452,339, Reissue of U.S. Patent No. 8,236,145	Examiner: Vincent, Sean E.
Filed: August 5, 2014	Atty. Dkt. No.: PET744/58000
For: ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE	Confirmation No.: 7313

RESPONSE TO OFFICE ACTION OF JUNE 29, 2015

VIA EFS WEB

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

Sir:

The current paper is filed in in response to an Office Action of June 29, 2015. The Commissioner is requested to consider this a petition for a three month extension of time. Authorization to charge the requisite fee of $350.00 for a micro-entity is filed herewith. Should any additional fees under 37 C.F.R. §§ 1.16 to 1.21 be deemed necessary for any reason relating to these materials, or should any fees be necessary in order to obtain an extension of time in which to respond at any time related to the prosecution of this application, the Commissioner is hereby authorized to deduct said fees from Vinson & Elkins L.L.P. Deposit Account No. 220365/PET744/58000.

Amendment to Specification is on page 2.
Amended claims begin on page 3.
Remarks begin on page 6.
Reconsideration of the claims is respectfully requested.

Amendment to the Specification

Please insert the following substitute paragraph at [0029] on page 9 of the originally filed application (col. 6, lines 1-28 of the issued patent).

FIG. 1A is a left side cross-sectional view of a radiator **11** having an electrolysis prevention device **12** in accordance with a first preferred embodiment of the present invention. As shown therein, an electrolysis prevention device **12** includes a sacrificial anode **13** supported at the end of a sleeve wire, metal slide, clip **15** or the like such that the anode is disposed adjacent the radiator inlet **17**. The anode 13 should be composed of a metal that reacts strongly with oxygen, also known as an active metal, such as magnesium, aluminum, zinc or combinations thereof. The anode support **19** extends through and out the radiator inlet and is doubled back around the inlet ~~fitting~~ connection **16**. The radiator hose **21** slides over the inlet ~~fitting~~ connection **16** and is clamped in place. The exposed end **23** of the anode support **19** optionally may be connected via ground wire (not shown) to the wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like. However, grounding of the anode is not a necessary aspect of this embodiment, or any embodiment, of the present invention.

Amendments to the Claims

1. (original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of aluminum.

3. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of magnesium.

4. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of zinc.

5. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is grounded to a vehicle.

6. (original) The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. (original) The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. (original) The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. (original) The electrolysis prevention device of claim 1 wherein the wherein the engine heat exchange component is a heater core.

10. (original) A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. (original) A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. (original) A method of preventing corrosion of an engine heat exchange component comprising adding or installing a sacrificial anode assembly within the heat exchange component adjacent an inlet thereof.

13. (original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. (original) An engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

15. (previously presented) The method of claim 12, wherein said engine heat exchange component is a radiator.

16. (previously presented) The method of claim 15, wherein said sacrificial anode consists essentially of an active metal.

17. (previously presented) The method of claim 16, wherein said sacrificial anode consists essentially of aluminum, magnesium, or zinc.

18. (previously presented) The method of claim 12, wherein said sacrificial anode is added or installed in a fitting hole in the radiator adjacent to said inlet.

19. (previously presented) The method of claim 12, wherein said sacrificial anode is grounded to said motor vehicle.

20. (previously presented) A method of preventing corrosion of an engine heat exchange component comprising adding or installing a sacrificial anode assembly within the heat exchange component within 10 inches of the center of an inlet thereof.

21. (previously presented) The method of claim 20, wherein said engine heat exchange component is a radiator.

22. (previously presented) The method of claim 21, wherein said engine heat exchange component comprises one or more aluminum components.

23. – 31. (canceled)

32. (new) The method of claim 12, wherein the sacrificial anode is installed or added into the heat exchange assembly within the fluid flow path of the heat exchange assembly.

Remarks

Status of the Claims

Claims 1-14 as issued remain in this application and are identified as "original" in this response. Claims 23-31 have been canceled. New claim 32 has been added.

Claims 1-22 and 32 are pending in the reissue application.

Reissue Declaration

Filed herewith is an amended reissue declaration identifying an error which identifies an error made during prosecution. In an office action response dated, February 29, 2012, Applicant erroneously indicated that claim 12 and claims dependent thereon were being canceled under traverse in order to simplify prosecution. Claim 12, however, was not canceled and was subsequently issued.

Claim Rejections Under 35 USC § 251

Claims 1-31 are rejected for a defective reissue declaration. An amended declaration is filed herewith, rendering this objection mute.

Claims 20-31 are rejected as a recapture of broadened claim subject matter. Claims 23-31 have been canceled. Applicant respectfully traverses this rejection with respect to claims 20-22 and claims 23-31, as these claims cannot be an impermissible recapture of surrendered subject matter, primarily because claims all these claims, and more relevantly claims 20-22 are more narrow than issued claim 12. It is well established that if the claim in question is not broader than any claim issued in the patent, then there can be no recapture (MPEP 1412.02 I).

Claim Rejections Under 35 USC § 112

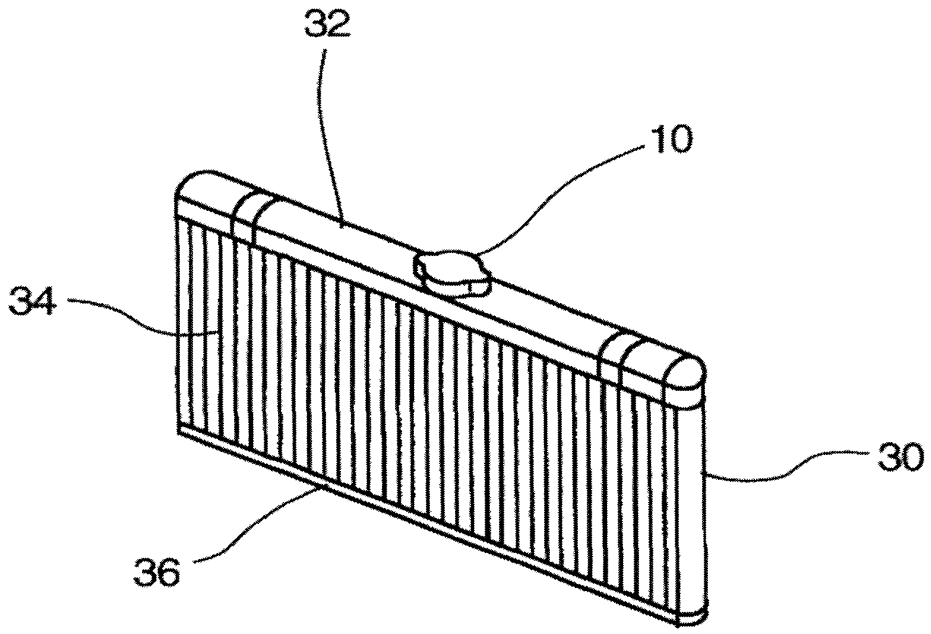
Claims 1-11, 13 and 14 are rejected because of an inconsistency in the description of the inlet connection in the specification. The Specification has been amended to correct this inconsistency and this rejection is now moot.

Claim Rejections Under 35 USC § 102

Claims 12 and 15-22 are rejected as anticipated by Green (US 5,649,591). Applicant respectfully traverses.

Green describes a radiator cap that incorporates or has a sacrificial node attached to the cap. Green is completely silent regarding where the cap is positioned on the radiator or any relationship to the position of the inlet that receives hot water from the engine.

FIG. 3 of Green is the only indication of the position of the radiator cap, which is at the center of the upper tank. No inlet connection is shown or described.



The current claims are based on the discovery by the inventor that in a radiator or heat exchanger core, a sacrificial anode oxidizes or corrodes and thus prevents electrolysis only when placed in proximity to the hot water inlet. This invention thus solves a problem that was unrecognized in the art. Additionally, there is no evidence presented that any sacrificial anode was placed near an inlet in any prior art radiator.

Green cannot anticipate claim 12 because Green does not disclose or describe any inlet at all.

Applicant first asserts that in order to anticipate claim 12, the reference must describe a sacrificial anode adjacent the inlet. Green cannot anticipate claim 12 at least because Green is completely missing at least on element of the claim. The Action states that Green anticipates claim 12 on the ground that Green "only discloses one inlet which is the opening into which the radiator cap and the sacrificial anode are placed." The Action's attempt to reconstruct the claim by calling the filler opening the inlet, however, would render any such radiator inoperable. The radiator in FIG. 3 of Green is missing essential elements of a radiator, since the radiator would be inoperable without connections to the engine that allow hot water from the engine to flow in and cooler water to flow out and back into the hot engine. One of skill upon reading Green would understand that a filler opening with a radiator cap is not the "inlet" and could not function to introduce hot coolant from the engine into the radiator and also provide an outlet for cooled water during use.

As shown in FIG. 3, Green is missing any representation of an engine coolant inlet or outlet, which are hose connectors that are connected from the engine to the radiator. Furthermore, since Green does not bother to even describe an inlet, he can neither describe nor

suggest that the radiator cap and the attached anode should be in any particular location relative to the inlet.

Green cannot inherently anticipate because to do so, the radiator cap of Green would have to be adjacent the inlet in each and every case. The examiner has presented no evidence of any radiator cap or more importantly any anode being placed in the vicinity of a radiator inlet. This rejection thus cannot stand.

For all the reasons stated above, Green also cannot render the claims obvious, either alone or in combination with any of the cited art.

Conclusion

Applicant submits that all the claims are now in condition for immediate allowance and reissue and respectfully requests an indication of such favorable action. If the Examiner has any questions or comments that would expedite progression of the claims to allowance, a telephone call to the undersigned would be welcomed.

Respectfully submitted,

Timothy S. Corder
Reg. No. 38,414
Agent for Applicant

Vinson & Elkins L.L.P.
First City Tower
1001 Fannin Street, Suite 2500
Houston, TX 77002-6760
512.542.8446
Date: December 29, 2015

Doc Code REIS DECL
Document Description Reissue Declaration Filed In Accordance With MPEP 1414

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REISSUE APPLICATION DECLARATION BY THE INVENTOR	Docket Number (Optional) PET44/4-001REUS/58000

I hereby declare that
Each inventor's residence and mailing address are stated below next to their name
I believe I am the original inventor or an original joint inventor of the subject matter which is described and claimed in patent number 8 236 145, granted August 7 2012 and for which a reissue patent is sought on the invention titled Electrolysis Prevention Device and Method of Use,

the specification of which

☐ is attached hereto

☑ was filed on August 5, 2014 as reissue application number 14/452,339

The above-identified application was made or authorized to be made by me

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U S C 1001 by fine or imprisonment of not more than five (5) years, or both

I believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below (Check all boxes that apply)

☐ by reason of a defective specification or drawing

☐ by reason of the patentee claiming more or less than he had the right to claim in the patent

☑ by reason of other errors

At least one error upon which reissue is based is described below If the reissue is a broadening reissue, a claim that the application seeks to broaden must be identified

Applicant erroneously indicated that claim 12 and claims dependent thereon were being canceled under traverse in order to simplify prosecution. Claim 12, however, was not canceled and was subsequently issued.

This collection of information is required by 37 CFR 1 175 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 30 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

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(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)

Docket Number (Optional)
PET744/4-001REUS/58000

Note. To appoint a power of attorney, use form PTO/AIA/81.

Correspondence Address: Direct all communications about the application to:

☑ The address associated with Customer Number: 21586

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

Legal name of sole or first inventor (*E.g.*, Given Name (first and middle (if any) and Family Name or Surname)

Frank Petrosino

Inventor's Signature	Date (Optional)
	0

Residence: City	State	Country
Concord	NC	US

Mailing Address

3929 Amarillo Dr.

City	State	Zip	Country
Concord	NC	28027	US

	Additional joint inventors are named on the _____ supplemental sheet(s) PTO/AIA/10 attached hereto.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

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.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Frank		Petrosino	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Concord	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	3929 Amarillo Dr.		
Address 2			
City	Concord	State/Province	NC
Postal Code	28027	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).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	21586		
Email Address	iptldocket@velaw.com	Add Email	Remove Email
Email Address	tcorder@velaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	Electrolysis Prevention Device and Method of Use		
Attorney Docket Number	PET744/4-001REUS/58000	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	27	Suggested Figure for Publication (if any)	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **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).
Either enter 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:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	21586		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim 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.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	reissued of	12/631903	2009-12-07	8236145	2012-08-07

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12/631903	Claims benefit of provisional	61/120296	2008-12-05

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 priority to a foreign application. 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. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove			
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◯ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Applicant:

Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS/58000
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Timothy S Corder/			Date (YYYY-MM-DD)	2015-12-29
First Name	Timothy	Last Name	Corder	Registration Number	38,414

Additional Signature may be generated within this form by selecting the Add button.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PET744/4-001REUS/58000
		Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use		

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.**

Electronic Patent Application Fee Transmittal	
Application Number:	14452339
Filing Date:	05-Aug-2014
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Filer:	Timothy S. Corder/Debbie McCullough
Attorney Docket Number:	PET744/4-001REUS/58000
Filed as Micro Entity	
Filing Fees for Utility under 35 USC 111(a)	

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($)
Extension - 3 months with $0 paid	3253	1	350	350
Miscellaneous:				
		Total in USD ($)		**350**

Electronic Acknowledgement Receipt	
EFS ID:	24483076
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Timothy S. Corder/Debbie McCullough
Filer Authorized By:	Timothy S. Corder
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	29-DEC-2015
Filing Date:	05-AUG-2014
Time Stamp:	16:52:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$350
RAM confirmation Number	3703
Deposit Account	220365
Authorized User	BORGMAN, STEVEN R.
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 CFR 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Arguments/Remarks Made in an Amendment	Response.pdf	322365 bccebb72b55dcf5ddcf95f2612e9604ba042 4f0c	no	9
Warnings:					
Information:					
2	Oath or Declaration filed	Declaration.pdf	166001 7757941ddad149acc107caa8ba6a3248ee2 00aea	no	2
Warnings:					
Information:					
3	Application Data Sheet	AmendedApplicationDataShee t.pdf	422000 5ebcb7d92aa54b5152fa2e59966c3b56ace 36f3b	no	7
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
4	Fee Worksheet (SB06)	fee-info.pdf	30506 1428dc27947153bbf7e912bf011a9ca26bc 9ff07	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	940872		

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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.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/452,339	Filing Date 08/05/2014	☐ To be Mailed

ENTITY: ☐ LARGE ☐ SMALL ☒ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	12/29/2015	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 23	Minus	** 31	= 0	X $20 =	0
	Independent (37 CFR 1.16(h))	* 4	Minus	***5	= 0	X $105 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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.

LIE
/MARTHA NEWMAN/

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.**
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000	7313

21586 7590 02/24/2016

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EXAMINER
VINCENT, SEAN E

ART UNIT	PAPER NUMBER
3991	

NOTIFICATION DATE	DELIVERY MODE
02/24/2016	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):

IPTLdocket@velaw.com
tcorder@velaw.com
bmelder@velaw.com

Office Action Summary	Application No. 14/452,339	Applicant(s) PETROSINO, FRANK	
	Examiner SEAN E. VINCENT	Art Unit 3991	AIA (First Inventor to File) Status No

-- 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* MONTHS 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 *12-29-15*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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) *1-22 and 32* 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) *1-22 and 32* is/are rejected.

8)☒ Claim(s) *15-22 and 32* 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 *8-5-14* 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).

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)).

** 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/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application is being examined under the pre-AIA first to invent provisions.

Reissue Applications

For reissue applications filed before September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the law and rules in effect on September 15, 2012. Where specifically designated, these are "pre-AIA" provisions.

For reissue applications filed on or after September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the current provisions.

Priority

US Patent 8,236,145 (hereafter referred to as "The '145 Patent") claimed priority to US Provisional application No. 61/120,296 filed on Dec. 5, 2008. The Application Data Sheet submitted December 29, 2015 correctly states the domestic priority claim.

Status of the Claims

Original claims 1-14 from the '145 Patent are presented.

New claims 15-22 and 32 are proposed to be added by present reissue.

New claims 21-31 have been canceled.

Objection to amended Specification and Claims under 37 CFR 1.173

The amendment filed December 29, 2015 is objected to because it proposes amendments to the claims that do not comply with 37 CFR 1.173(b)-(d), which sets forth the manner of making amendments in reissue applications. **(SEE MPEP 1453)**

The amendment to the specification uses strikeout instead of brackets. The amendment to the claims does not underline the new reissue claims. Subsequent amendments must follow the proper format for reissue application amendments:

> 37 CFR 1.173(d) Changes shown by markings. Any changes relative to the patent being reissued which are made to the specification, including the claims, upon filing, or by an amendment paper in the reissue application, must include the following markings:
>
> (1) The matter to be omitted by reissue must be enclosed in brackets; and
>
> (2) The matter to be added by reissue must be underlined, except for amendments submitted on compact discs (§§ 1.96 and 1.821(c)). Matter added by reissue on compact discs must be preceded with "U" and end with "/U" to properly identify the material being added.

> 37 CFR 1.173(g) Amendments made relative to the patent. All amendments must be made relative to the patent specification, including the claims, and drawings, which are in effect as of the date of filing of the reissue application.

Furthermore, the December 29, 2015 amendment added new claim 32, but failed to provide an explanation of support in the disclosure of the patent for the changes made to the claims. Subsequent amendments must include an explanation of support for new claims:

> 37 CFR 1.173(c): Status of claims and support for claim changes. Whenever there is an amendment to the claims pursuant to paragraph (b) of this section, there must also be supplied, on pages separate from the pages containing the changes, the status (i.e., Original, Amended, Previously Amended, New, or Canceled), as of the date of the amendment, of all patent claims and of all added claims, and an explanation of the support in the disclosure of the patent for the changes made to the claims.

In order to expedite prosecution, the December 29, 2015 amendment will be treated as entered, but a properly formatted amendment is required in response to this office action.

Reissue Declaration

The reissue oath/declaration filed on December 29, 2015 is defective because the error which is relied upon to support the reissue application is not an error upon which a reissue can be based. See 37 CFR 1.175 and MPEP § 1414.

The declaration states "Applicant erroneously indicated that claim 12 and claims dependent thereon were being canceled under traverse in order to simplify prosecution. Claim 12, however, was not canceled and was subsequently issued." This is not an error that causes the patent to be wholly or partly inoperative or invalid. This would more accurately be called a clerical error. (SEE MPEP 1402).

It is suggested that the Patent Owner base this reissue application on the errors in the specification which were identified in the Non-Final Rejection.

Upon review of the Patent Owner's remarks filed December 29, 2015 in page 6, the recapture objection has been withdrawn. As stated by the Patent Owner, since claims 20-22 are narrower than patented claim 12, there can be no recapture. Using the analysis set forth in MPEP 1412.03, there is no reissue claim that is broader in scope than *each and every patent claim*. The previous objection to the Reissue Declaration for not identifying a claim to be broadened is also withdrawn.

Claim Rejections - 35 USC § 251

Claims 1-22 and 32 are rejected as being based upon a defective reissue declaration under 35 U.S.C. 251 as set forth above. See 37 CFR 1.175.

The nature of the defect(s) in the declaration is set forth in the discussion above in this Office action.

Specification

The prior objection to the specification is withdrawn, but a properly formatted amendment is required in response to this office action.

Claim Construction

All of the independent claims 1, 12, 13 and 20 require a heat exchange component having an inlet. The '145 Patent notes in col. 5, lines 39-47 that the meaning of each term used therein should be given the meaning understood by the Ordinary Artisan. In col. 6, lines 1-3, "engine heat exchange component" is stated to refer to an engine radiator, heater core or other device for exchanging heat in an engine. In col. 6, lines 52-55, the '145 Patent says: "The specific inlet connection 16 varies by vehicle make, model and model year, but the inlet 17 is generally understood to refer to the vicinity of where hot water coming directly from the engine enters into the radiator 11." Therefore, the term "engine heat exchange component" will be considered synonymous with "radiator" and "inlet" will be interpreted **as the vicinity of the heat exchange component where hot water enters**. "Inlet" and "Inlet connection" will be

interpreted differently in that the connection is a specific structure while the inlet is the vicinity of the inlet connection.

Col. 6, lines 55-58 of the '145 Patent state: "The radiator 11 may include a fill cap 39 as shown in FIG. 1C but is understood to be optional and is not present on many radiators 39." FIG. 1C shows an anode holder 12 directly adjacent to the inlet 17 but also shows a fill cap 39 in the vicinity of the inlet. The discussion of crossflow vs. downflow radiator types in col. 6, lines 10-45 lacks a mention of the fill cap 39, but the figures appear to illustrate that downflow radiators locate the inlet connection and the fill cap on the upper side of the radiator. The figures are inconsistent in the labeling of the inlet 17 or the inlet connection 16 or both. Therefore, "inlet connection" and "fill cap" will be interpreted as separate structures because a fill cap or the opening into which a fill cap enters would not permit hot water to enter a radiator. Furthermore, the inlet connection and fill cap would have to be adjacent to each other for an anode holder or anode assembly located in the fill cap to be adjacent the inlet connection. However, since the inlet is not a structure but a vicinity, the fill cap would only need to be in the same vicinity as the inlet connection for the fill cap to be adjacent the inlet. .

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 32 is rejected under 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Newly proposed claim 32 requires that the sacrificial anode be installed or added into the heat exchange assembly within the fluid flow path of the heat exchange assembly. The phrase "within the fluid flow path" is not used anywhere in the specification as filed to describe the location of the sacrificial anode. There is not adequate written support for this language as added to the claims.

The prior rejection of claims 1-11, 13 and 14 under 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite is withdrawn but a properly formatted amendment is required in response to this office action.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 12, 15-22 and 32 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Green (US 5,649,581).

Green teaches a method of preventing corrosion of a radiator 30 wherein a sacrificial anode 26 is installed in the radiator cap 10 which is placed on a radiator

opening (see abstract, figs. 2 and 3, col. 2, lines 14-51). With regard to claim 12, Green only discloses one inlet which is the opening into which the radiator cap and the sacrificial anode are placed. Green appears to illustrate a downflow type radiator in figure 3. Based on the claim construction outlined above, the ordinary artisan would understand that the radiator cap is adjacent an inlet and therefore the anode assembly is adjacent an inlet.

With regard to claim 15, a radiator is clearly disclosed by Green.

With regard to claims 16 and 17, Green specifically teaches sacrificial anodes of zinc, magnesium or aluminum alloy in col. 2, lines 40-44.

With regard to claim 18, various detachable securing devices such as snaps and screw assemblies are taught to be known in the art for installing the anode into the radiator cap (col. 2, lines 61-63). A screw assembly would necessarily utilize a fitting hole and such a hole would have been adjacent the inlet opening of Green.

With regard to claim 19, Green states that the generation of electrical current by the anode protects the radiator (col. 2, lines 34-51). Such electrical current would necessarily involve grounding the anode to the vehicle in which the radiator is being used.

With regard to claim 20, Green anticipates the claimed method for the same reasons as in the rejection of claim 12. Since the inlet is the vicinity of the heat exchange component where hot water enters, the ordinary artisan would have understood Green's anode assembly to be within ten inches of the center of this vicinity.

With regard to claim 21, a radiator is clearly disclosed by Green.

With regard to claim 22, the problem of electrolytic activity in the presence of aluminum components are discussed by Green in col. 1, lines 33-39 and sacrificial anodes are discussed for solving the problem in col. 1, lines 46-52.

With regard to claim 32, since the inlet is the vicinity of the heat exchange component where hot water enters, the ordinary artisan would have understood Green's anode assembly to be within the fluid flow path of the heat exchange assembly.

Response to Arguments

Applicant's arguments filed December 29, 2015 have been fully considered but they are not persuasive.

In response to applicant's arguments that Green does not anticipate claim 12, the Specialist disagrees. Patent Owner argues only that Green cannot anticipate the claim because Green doesn't disclose an "inlet" per se. These arguments dismiss the claim construction which is cited within the rejection over Green. Patent Owner has made no attempt to dispute the claim construction set forth. Patent Owner has not discussed the claims depending from claim 12, even newly proposed claim 32.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Notably, Gush teaches a radiator having an anticorrosion electrode bar extending across the top of the radiator (see figures 1-3 and page 1, lines 90-104 and page 2,

lines 35-44). Gush also teaches the application of an anticorrosion electrode to a cooling water manifold (page 2, lines 20-29). Downflow types of radiator for motor vehicles have been well known for a long time as shown by Gush. The top (“L") of a downflow radiator or the cooling water manifold (“O”) through which hot water was known to flow from an engine into a radiator is taught by Gush to contain anticorrosion electrodes at their centers. The electrodes of Gush are effectively located at the center of the inlet.

Claims 1-22 and 32 are rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Applicant is reminded of the continuing obligation under 37 CFR 1.178(b), to timely apprise the Office of any prior or concurrent proceeding in which Patent No. 8,236,145 is or was involved. These proceedings would include interferences, reissues, reexaminations, and litigation.

Applicant is further reminded of the continuing obligation under 37 CFR 1.56, to timely apprise the Office of any information which is material to patentability of the claims under consideration in this reissue application.

These obligations rest with each individual associated with the filing and prosecution of this application for reissue. See also MPEP §§ 1404, 1442.01 and 1442.04.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN E. VINCENT whose telephone number is (571)272-1194. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Stein can be reached on (571) 272-1544. 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.

/SEAN E VINCENT/
Patent Reexamination Specialist
Central Reexamination Unit 3991
Conferees:

/TIMOTHY SPEER/
Patent Reexamination Specialist
Central Reexamination Unit 3991

/STEPHEN J. STEIN/
Supervisory Patent Reexamination Specialist
Central Reexamination Unit 3991

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14452339	PETROSINO, FRANK
	Examiner	Art Unit
	SEAN E VINCENT	3991

CPC- SEARCHED		
Symbol	Date	Examiner
see EAST search history	6-10-15	SV
above up to date	2-9-16	SV

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
see EAST search history	6-10-15	SV
prior prosecution and patent family reviewed	6-10-16	SV
above up to date	2-9-16	SV

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	2	("4776392" | "5649591").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/02/09 17:42
L3	137	(C23F13/18).CPC.	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L4	10032657	@pd < "20081205"	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L5	95	L3 and L4	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L6	137	(C23F13/18).CPC.	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L7	13	(radiator or (heat adj exchanger) or condenser) AND ((C23F13/005).CPC.)	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L8	10032657	@pd < "20081205"	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L9	95	L6 and L8	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L10	13	L7 not L9	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L11	3202	sacrificial near2 anode	US-PGPUB; USPAT; USOCR	OR	ON	2016/02/09 17:42
L12	513768	(radiator or (heat adj exchanger) or condenser)	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L13	607	L11 and L12	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L14	54760	tether	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L15	22	L13 and L14	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L16	54209	L12 near4 inlet	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L17	81	L11 and L16	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L18	3	L11 same L16	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L19	1	"8236145".did.	US-PGPUB; USPAT	OR	ON	2016/02/09 17:42
L20	2863	sacrificial near2 anode	EPO; JPO; DERWENT	OR	ON	2016/02/09 17:42
L21	605218	(radiator or (heat adj exchanger) or condenser)	EPO; JPO; DERWENT	OR	ON	2016/02/09 17:42
L22	10395	tether	EPO; JPO; DERWENT	OR	ON	2016/02/09 17:42

L23	758	L20 and L21	EPO; JPO; DERWENT	OR	ON	2016/02/09 17:42
L24	0	L22 and L23	EPO; JPO; DERWENT	OR	ON	2016/02/09 17:42
L25	2744	L22 and (mount or mounting or plug or attach or install or hang or holder or fitting)	EPO; JPO; DERWENT	OR	ON	2016/02/09 17:42
L26	18	L23 and (mount or mounting or plug or attach or install or hang or holder or fitting)	EPO; JPO; DERWENT	OR	ON	2016/02/09 17:42

EAST Search History (Interference)

<This search history is empty>

2/9/2016 5:43:56 PM
C:\Users\svincent\Documents\EAST\Workspaces\14452339.wsp

To: IPTLdocket@velaw.com,tcorder@velaw.com,bmelder@velaw.com
From: PAIR_eOfficeAction@uspto.gov
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Feb 24, 2016 05:22:43 AM

Dear PAIR Customer:

VINSON & ELKINS, L.L.P.
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1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 21586 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

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Application	Document	Mailroom Date	Attorney Docket No.
14452339	CTFR	02/24/2016	PET744/4-001REUS/58000

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HOUSTON, TX 77002-6760

Courtesy Reminder for
Application Serial No: 14/452,339

Attorney Docket No:
PET744/4-001REUS/58000
Customer Number: 21586
Date of Electronic Notification: 02/24/2016

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

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PTO/SB/30 (07-14)
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Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	14/452,339
Filing Date	August 5, 2014
First Named Inventor	Frank Petrosino
Art Unit	3991
Examiner Name	Sean E. Vincent
Attorney Docket Number	PET744/4-001REUS/58000

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, to any international application that does not compy with the requirements of 35 U.S.C 371, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO on page 2.)

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☑ Enclosed

      i. ☑ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☑ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   a. ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

   a. ☑ The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 22-0365.

      i. ☑ RCE fee required under 37 CFR 1.17(e)

      ii. ☐ Extension of time fee (37 CFR 1.136 and 1.17)

      iii. ☐ Other _____

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

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.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Timothy S. Corder/	Date	May 24, 2016
Name (Print/Type)	Timothy S. Corder, Patent Agent	Registration No.	38,414

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature			
Name (Print/Type)		Date	

This collection of information is required by 37 CFR 1.114. 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: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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Electronic Patent Application Fee Transmittal	
Application Number:	14452339
Filing Date:	05-Aug-2014
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Filer:	Timothy S. Corder/Bobbie Melder
Attorney Docket Number:	PET744/4-001REUS/58000
Filed as Micro Entity	
Filing Fees for Utility under 35 USC 111(a)	

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($)
Miscellaneous:				
RCE - 1st Request	3801	1	300	300
		Total in USD ($)		**300**

Electronic Acknowledgement Receipt	
EFS ID:	25873200
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Timothy S. Corder/Bobbie Melder
Filer Authorized By:	Timothy S. Corder
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	24-MAY-2016
Filing Date:	05-AUG-2014
Time Stamp:	17:15:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$300
RAM confirmation Number	3857
Deposit Account	220365
Authorized User	CORDER, TIM S
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 CFR 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 CFR 1.19 (Document supply fees)

Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 CFR 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	Reissue dec filed in accordance with MPEP 1414	20160524Declaration.pdf	2086579 74dfe23f9639607d05e12ac6fbe4361d396ae034	no	2
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	20160524IDS.pdf	1050134 ac21b90c97f95caf92ec0eb24eac7e7c318f1432	no	4
Warnings:					
Information:					
3	Response After Final Action	20160524ResponseFOA.pdf	396781 ea59d484adb3ac19c9f79be193d421e57331b41a	no	11
Warnings:					
Information:					
4	Request for Continued Examination (RCE)	20160524RCE.pdf	166049 3ad1a588ef1d312c7d6fa050c75b26ef10c58506	no	1
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30241 a192666d3061c0f507d7629f9dfffe3aac8db224	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3729784		

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.

Doc Code: REIS.DECL
Document Description: Reissue Declaration Filed In Accordance With MPEP 1414

PTO/AIA/05 (08-12)
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REISSUE APPLICATION DECLARATION BY THE INVENTOR	Docket Number (Optional) PET744/4-001REUS/58000

I hereby declare that:
Each inventor's residence and mailing address are stated below next to their name.
I believe I am the original inventor or an original joint inventor of the subject matter which is described and claimed in patent number 8,236,145, granted August 7, 2012 and for which a reissue patent is sought on the invention titled Electrolysis Prevention Device and Method of Use,

the specification of which

☐ is attached hereto.

☑ was filed on August 5, 2014 as reissue application number 14/452,339.

The above-identified application was made or authorized to be made by me.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

☑ by reason of a defective specification or drawing.

☑ by reason of the patentee claiming more or less than he had the right to claim in the patent.

☐ by reason of other errors.

At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, a claim that the application seeks to broaden must be identified.

Filed herewith is an amended reissue declaration identifying an error made during prosecution. Col. 6, lines 19-22 of the '145 patent refer to inlet fitting 16. The rest of the patent refers to inlet connection 16. This inconsistency in identifying element 16 is corrected herein.

Applicant further claimed less than that to which he is entitled, which is the subject matter of claims dependent on claim 12, specifically claims 15-20, 21 and 32.

This collection of information is required by 37 CFR 1.175. 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 30 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.**

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(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)

Docket Number (Optional)
PET744/4-001REUS/58000

Note: To appoint a power of attorney, use form PTO/AIA/81.

Correspondence Address: Direct all communications about the application to:

☑ The address associated with Customer Number: 21586

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

Legal name of sole or first inventor (*E.g.*, Given Name (first and middle (if any) and Family Name or Surname)
Frank Petrosino

Inventor's Signature		Date (Optional) 5/24/16	
Residence: City Concord	State NC	Country US	
Mailing Address 3929 Amarillo Dr.			
City Concord	State NC	Zip 28027	Country US

☐ Additional joint inventors are named on the _____ supplemental sheet(s) PTO/AIA/10 attached hereto.

PTO/SB/08a (03-15)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14452339
Filing Date	2014-08-05
First Named Inventor	Frank Petrosino
Art Unit	3991
Examiner Name	Sean E. Vincent
Attorney Docket Number	PET744/4-001REUS/58000

U.S.PATENTS Remove

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	1514903		1924-04-18	Gush	
	2	4776392	A	1988-10-11	Loyd	
	3	5292595	A	1994-03-08	Yamauchi, et al.	
	4	5649591	A	1997-07-22	Green	

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U.S.PATENT APPLICATION PUBLICATIONS Remove

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 Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14452339
	Filing Date	2014-08-05
	First Named Inventor	Frank Petrosino
	Art Unit	3991
	Examiner Name	Sean E. Vincent
	Attorney Docket Number	PET744/4-001REUS/58000

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NON-PATENT LITERATURE DOCUMENTS Remove

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[5]
	1		

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EXAMINER SIGNATURE

Examiner Signature		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.

[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.16 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	14452339
	Filing Date	2014-08-05
	First Named Inventor	Frank Petrosino
	Art Unit	3991
	Examiner Name	Sean E. Vincent
	Attorney Docket Number	PET744/4-001REUS/58000

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	/Timothy S. Corder/	Date (YYYY-MM-DD)	2016-05-24
Name/Print	Timothy S. Corder, Patent Agent	Registration Number	38,414

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.**

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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 the Freedom of Information Act requires disclosure of these record s.

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 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Frank Petrosino	Group Art Unit: 3991
Serial No.: 14/452,339, Reissue of U.S. Patent No. 8,236,145	Specialist: Vincent, Sean E.
Filed: August 5, 2014	Atty. Dkt. No.: PET744/58000
For: ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE	Confirmation No.: 7313

RESPONSE TO FINAL OFFICE ACTION OF FEBRUARY 24, 2016 FILED WITH A REQUEST FOR CONTINUED EXAMINATION (RCE)

VIA EFS WEB

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

Sir:

The current paper is filed in in response to a Final Office Action of February 24, 2016. This paper is thus believed to be timely filed. Also filed herewith is a Request for Continued Examination (RCE) and the requisite fee of $300.00 for filing an RCE for a micro-entity. Should any additional fees under 37 C.F.R. §§ 1.16 to 1.21 be deemed necessary for any reason relating to these materials, or should any fees be necessary in order to obtain an extension of time in which to respond at any time related to the prosecution of this application, the Commissioner is hereby authorized to deduct said fees from Vinson & Elkins L.L.P. Deposit Account No. 220365/PET744/58000.

A corrected amendment to Specification is on page 2.

Amended claims begin on page 3.

Remarks begin on page 6.

Reconsideration of the claims is respectfully requested.

Amendment to the Specification

Please insert the following substitute paragraph at [0029] on page 9 of the originally filed application (col. 6, lines 1-28 of the issued patent).

[0029] FIG. 1A is a left side cross-sectional view of a radiator **11** having an electrolysis prevention device **12** in accordance with a first preferred embodiment of the present invention. As shown therein, an electrolysis prevention device **12** includes a sacrificial anode **13** supported at the end of a sleeve wire, metal slide, clip **15** or the like such that the anode is disposed adjacent the radiator inlet **17**. The anode 13 should be composed of a metal that reacts strongly with oxygen, also known as an active metal, such as magnesium, aluminum, zinc or combinations thereof. The anode support **19** extends through and out the radiator inlet and is doubled back around the inlet [fitting] connection **16**. The radiator hose **21** slides over the inlet [fitting] connection **16** and is clamped in place. The exposed end **23** of the anode support **19** optionally may be connected via ground wire (not shown) to the wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like. However, grounding of the anode is not a necessary aspect of this embodiment, or any embodiment, of the present invention.

Amendments to the Claims

1. (original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of aluminum.

3. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of magnesium.

4. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of zinc.

5. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is grounded to a vehicle.

6. (original) The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. (original) The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. (original) The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. (original) The electrolysis prevention device of claim 1 wherein the wherein the engine heat exchange component is a heater core.

10. (original) A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. (original) A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. (original) A method of preventing corrosion of an engine heat exchange component comprising adding or installing a sacrificial anode assembly within the heat exchange component adjacent an inlet thereof.

13. (original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. (original) An engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

15. (previously presented) The method of claim 12, wherein said engine heat exchange component is a radiator.

16. (previously presented) The method of claim 15, wherein said sacrificial anode consists essentially of an active metal.

17. (previously presented) The method of claim 16, wherein said sacrificial anode consists essentially of aluminum, magnesium, or zinc.

18. (previously presented) The method of claim 12, wherein said sacrificial anode is added or installed in a fitting hole in the radiator adjacent to said inlet.

19. (previously presented) The method of claim 12, wherein said sacrificial anode is grounded to said motor vehicle.

20. (amended) [A] The method of claim 12 [preventing corrosion of an engine heat exchange component] comprising adding or installing a sacrificial anode assembly within the fluid flow path of the heat exchange component within 10 inches of the center of an inlet thereof.

21. (cancel)

22. (currently amended) The method of claim [[21]] 12, wherein said engine heat exchange component comprises one or more aluminum components.

23. – 31. (canceled)

32. (currently amended) The method of claim 12, wherein the sacrificial anode is installed or added into the heat exchange component within the fluid flow path of the heat exchange component.

Remarks

Status of the Claims

Claims 1-14 as issued remain in this application and are identified as "original" in this response. Claims 21, and 23-31 have been canceled.

Claims 20 and 22 are amended to be dependent from claim 12.

Claim 21 is canceled as redundant in light of the amendment to claim 20.

Claim 32 is amended to replace heat exchange [[assembly]] with heat exchange component, to be more consistent with the specification.

Claims 1-20, 22 and 32 are pending in the reissue application.

Reissue Declaration

Filed herewith is an amended reissue declaration identifying an error which identifies an error made during prosecution. Col. 6, lines 19-22 of the '145 patent refer to inlet fitting 16. The rest of the patent refers to inlet connection 16. This inconsistency in identifying element 16 is corrected herein.

Patent Owner further claimed less than he is entitled to claim, which is the subject matter of claims dependent on claim 12, specifically claims 15-20, 21 and 32.

Claim Rejections Under 35 USC § 251

Claims 1-31 are rejected for a defective reissue declaration. An amended declaration is filed herewith, rendering this objection moot.

Claim Construction

The Specialist has indicated that during examination, "engine heat exchange component" will be considered synonymous with "radiator." Patent Owner respectfully traverses at least because throughout the specification, and in the quote used by the Specialist from col. 6, lines

39-47 the term is broader than just a radiator and also includes heater cores and other devices to exchange heat in an engine. An example in which the heat exchange component is a heater core is shown in Fig. 9A, for example.

The Specialist has also indicated that the term inlet and inlet connection are different in that a connection is a specific structure while the inlet is the vicinity of the inlet connection.

Patent Owner respectfully traverses the construction of inlet. An inlet is more properly understood in the art as an opening that allows the inflow of liquid. So, while Patent Owner agrees that inlet is not necessarily a structure, the inlet is formed by an opening in the wall of the radiator or heater core that lets the water flow in.

An inlet, designated by identifier 17, as shown in Figs. 1A, 1C, 2A, 2C, 3A, 3D, 4A, 4C, 5A, 5C, 6A, 6C, and 10A, is illustrated as an opening in the wall that connects the interior of the connector to the fluid path in the heat exchange component. The inlet is, in every case, shown to be within the interior area of that opening when seen from the facing perspective and as at the opening in the wall of the heat exchange component when seen in cross-section.

Patent Owner urges, therefore, that the term inlet be construed to indicate an opening in the wall of the heat exchange component through which the hot water from the engine flows. For example, the specification at col 6, ln 10, describes the anode support as extending "through and out the radiator inlet." This is another indication that the inlet is correctly construed as an opening in the wall between the connector and the interior of the heat exchange component.

Patent Owner agrees that the inlet connection and the fill cap are different structures, however, Patent Owner submits that in order for the fill cap to anticipate claim 12, for example, the fill cap would need to be adjacent the inlet opening in the wall, rather than adjacent some undefined vicinity of the opening.

Claim Rejections Under 35 USC § 112

Claim 32 is rejected as allegedly failing to comply with the written description requirement of §112 on the ground that the term "within the fluid flow path" is not used in the specification.

Patent Owner respectfully traverses and submits that claim 32 is fully supported by the specification at least at [0013], "positioning the sacrificial anode further down **into the flow of the liquid coolant**," at [0033], "but the anode 13 itself hangs further down below the center axis of the radiator inlet 17 so as to be placed slightly lower **into the flow of the water, coolant, or antifreeze**, "(emphasis added) and in original claim 6.

While the wording is not exact, Patent Owner submits that to place the anode into the flow of water or liquid necessarily places the anode in the flow path of the liquid. One of skill in the art would understand, therefore, that the Patentee had possession of that aspect of the invention as of the filing date.

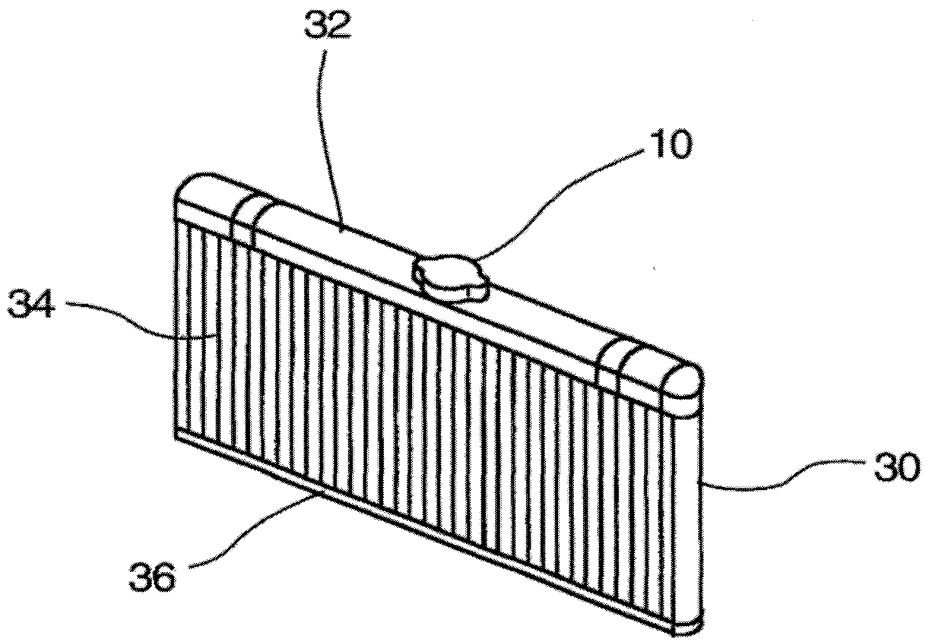
Patent Owner respectfully requests, therefore, that the rejection of claim 32 be withdrawn.

Claim Rejections Under 35 USC § 102

Claims 12, 15-22, and 32 are rejected as anticipated by Green (US 5,649,591). Patent Owner respectfully traverses.

Green describes a radiator cap that incorporates or has a sacrificial node attached to the cap. Green is completely silent regarding where the cap is positioned on the radiator or any relationship to the position of the inlet that receives hot water from the engine.

FIG. 3 of Green is the only indication of the position of the radiator cap, which is at the center of the upper tank. No inlet connection is shown or described.



The current claims are based on the discovery by the inventor that in a radiator or heat exchanger core, a sacrificial anode oxidizes or corrodes and thus prevents electrolysis only when placed in proximity to the hot water inlet. This invention thus solves a problem that was unrecognized in the cited art, at least because no evidence has been presented that any sacrificial anode was placed near an inlet in any prior art radiator or other heat exchange component.

Green cannot anticipate claim 12 because Green does not disclose or describe any inlet at all.

Patent Owner first asserts that in order to anticipate claim 12, the reference must describe a sacrificial anode adjacent the inlet. Green cannot anticipate claim 12 at least because Green is completely missing at least one element of the claim, e.g. an inlet. The Action states that Green anticipates claim 12 on the ground that Green "only discloses one inlet which is the opening into

which the radiator cap and the sacrificial anode are placed." The Action's attempt to reconstruct the claim by calling the filler opening the inlet, however, would render any such radiator inoperable. The radiator in FIG. 3 of Green is missing essential elements of a radiator, since the radiator would be inoperable without connections to the engine that allow hot water from the engine to flow in and cooler water to flow out and back into the hot engine. One of skill, upon reading Green would understand that a filler opening with a radiator cap is not the "inlet" and could not function to introduce hot coolant from the engine into the radiator and also to provide an outlet for cooled water during use.

As shown in FIG. 3, Green is missing any representation of an engine coolant inlet or outlet, which are hose connectors that are connected from the engine to the radiator. Furthermore, since Green does not bother to even describe an inlet, he can neither describe nor suggest that the radiator cap and the attached anode should be in any particular location relative to the inlet.

Green cannot inherently anticipate because to do so, the radiator cap of Green would have to be adjacent the inlet in each and every case. The Specialist has presented no evidence of any radiator cap or more importantly any anode being placed adjacent a radiator inlet. This rejection thus cannot stand.

Claims 15-20, 22 and 32 depend directly or indirectly from claim 12. Because the subject matter of claim 12 is not anticipated or suggested as discussed above, neither are any of claims 15-20, 22 or 32 anticipated or suggested by the cited art.

Conclusion

Patent Owner submits that all the claims are now in condition for immediate allowance and reissue and respectfully requests an indication of such favorable action. If the Specialist has any questions or comments that would expedite progression of the claims to allowance, a telephone call to the undersigned would be welcomed.

Respectfully submitted,

Timothy S. Corder
Reg. No. 38,414
Agent for Patent Owner

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Date: May 24, 2016

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/452,339	Filing Date 08/05/2014	☐ To be Mailed

ENTITY: ☐ LARGE ☐ SMALL ☒ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	05/24/2016	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 22	Minus	** 31	= 0	X $20 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***5	= 0	X $105 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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.

HSLIE
/LELAND WATKINS/

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.**
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000	7313

21586 7590 08/25/2016

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FIRST CITY TOWER
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HOUSTON, TX 77002-6760

EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED: 08/25/2016

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
14/452,339	05 August, 2014	PETROSINO, FRANK	PET744/4-001REUS/58000

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HOUSTON, TX 77002-6760

EXAMINER	
SEAN E. VINCENT	
ART UNIT	PAPER
3991	20160817

DATE MAILED:

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

Commissioner for Patents

The amendment filed May 24, 2016 proposes amendments to the claims that do not comply with 37 CFR 1.173(b), which sets forth the manner of making amendments in reissue applications. A supplemental paper correctly amending the reissue application is required.
Patent Owner is reminded of the treatment of the December 29, 2015 amendment described on pages 3 and 4 of the Final Rejection mailed February 24, 2016. A close review of MPEP 1453 is suggested.
A shortened statutory period for reply to this letter is set to expire TWO (2) MONTHS or SIXTY (60) DAYS, whichever is longer, from the mailing date of this letter.

/Jean C. Witz/ Supervisory Patent Reexamination Specialist CRU 3991	/SEAN E VINCENT/ Patent Reexam Specialist Central Reexam Unit 3991

PTO-90C (Rev.04-03)

To: IPTLdocket@velaw.com,tcorder@velaw.com,sbrown@velaw.com
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 21586

Aug 25, 2016 05:47:37 AM

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FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760
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Application	Document	Mailroom Date	Attorney Docket No.
14452339	CPA-AMD	08/25/2016	PET744/4-001REUS/58000

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PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Frank Petrosino	Group Art Unit: 3991
Serial No.: 14/452,339, Reissue of U.S. Patent No. 8,236,145	Specialist: Vincent, Sean E.
Filed: August 5, 2014	Atty. Dkt. No.: PET744/58000
For: ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE	Confirmation No.: 7313

RESPONSE TO NOTICE OF NON-COMPLIANT AMENDMENT OF AUGUST 25, 2016

VIA EFS WEB

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

Sir:

The current paper is filed in in response to a Notice of Non-Compliant Amendment of August 24, 2016. This paper is thus believed to be timely filed. No fees are believed to be due with the filing of this paper, however, should any fees under 37 C.F.R. §§ 1.16 to 1.21 be deemed necessary for any reason relating to these materials the Commissioner is hereby authorized to deduct said fees from Vinson & Elkins L.L.P. Deposit Account No. 220365/PET744/58000.

Amended claims begin on page 2.

Remarks begin on page 5.

Reconsideration of the claims is respectfully requested.

Amendments to the Claims

1. (original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of aluminum.

3. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of magnesium.

4. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of zinc.

5. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is grounded to a vehicle.

6. (original) The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. (original) The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. (original) The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. (original) The electrolysis prevention device of claim 1 wherein the wherein the engine heat exchange component is a heater core.

10. (original) A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. (original) A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. (original) A method of preventing corrosion of an engine heat exchange component comprising adding or installing a sacrificial anode assembly within the heat exchange component adjacent an inlet thereof.

13. (original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. (original) An engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

15. (previously presented) The method of claim 12, wherein said engine heat exchange component is a radiator.

16. (previously presented) The method of claim 15, wherein said sacrificial anode consists essentially of an active metal.

17. (previously presented) The method of claim 16, wherein said sacrificial anode consists essentially of aluminum, magnesium, or zinc.

18. (previously presented) The method of claim 12, wherein said sacrificial anode is added or installed in a fitting hole in the radiator adjacent to said inlet.

19. (previously presented) The method of claim 12, wherein said sacrificial anode is grounded to said motor vehicle.

20. (amended) The method of claim 12 comprising adding or installing a sacrificial anode assembly within the fluid flow of the heat exchange component is within 10 inches of the center of an inlet thereof.

21. (canceled)

22. (currently amended) The method of claim 12, wherein said engine heat exchange component comprises one or more aluminum components.

23. – 31. (canceled)

32. (currently amended) The method of claim 12, wherein the sacrificial anode is installed or added into the heat exchange component within the fluid flow of the heat exchange component.

Remarks

Status of the Claims

Claims 1-14 as issued remain in this application and are identified as "original" in this response. Claims 21, and 23-31 have been canceled.

Claims 20 and 22 are amended to be dependent from claim 12.

Claim 21 is canceled as redundant in light of the amendment to claim 20.

Claim 32 is amended to replace heat exchange [assembly] with heat exchange component, and to remove the term [path] to be more consistent with the specification.

Support for Claim 32 is found at least at [0013], "positioning the sacrificial anode further down **into the flow of the liquid coolant**," at [0033], "but the anode 13 itself hangs further down below the center axis of the radiator inlet 17 so as to be placed slightly lower **into the flow of the water, coolant, or antifreeze**, "(emphasis added) and in original claim 6.

Claims 1-20, 22 and 32 are pending in the reissue application.

Conclusion

Patent Owner submits that all the claims are believed to be in the correct format for Reissue and are now in condition for immediate allowance and reissue. Patent Owner respectfully requests an indication of such favorable action. If the Specialist has any questions or comments that would expedite progression of the claims to allowance, a telephone call to the undersigned would be welcomed.

Respectfully submitted,

/Timothy S. Corder/

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Agent for Patent Owner

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512.542.8446
Date: October 24, 2016

Electronic Acknowledgement Receipt	
EFS ID:	27306795
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Timothy S. Corder/Bobbie Melder
Filer Authorized By:	Timothy S. Corder
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	24-OCT-2016
Filing Date:	05-AUG-2014
Time Stamp:	18:57:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response After Final Action	20161024Response.pdf	163838 ee29a0ab2792a070a268cdeb72b3de250b9dc996	no	6

Warnings:

Information:	
Total Files Size (in bytes):	163838

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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
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PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/452,339	Filing Date 08/05/2014	☐ To be Mailed

ENTITY: ☐ LARGE ☐ SMALL ☒ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT	10/24/2016	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 22	Minus	** 31	= 0	X $20 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***5	= 0	X $105 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
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LIE
/POLIN ANG/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000	7313

21586 7590 09/05/2017

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EXAMINER
VINCENT, SEAN E

ART UNIT	PAPER NUMBER
3991	

NOTIFICATION DATE	DELIVERY MODE
09/05/2017	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):

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Office Action Summary	Application No. 14/452,339	Applicant(s) PETROSINO, FRANK	
	Examiner SEAN E. VINCENT	Art Unit 3991	AIA (First Inventor to File) Status No

-- 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* MONTHS 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 *10-24-16*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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) *1-20,22 and 32* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☒ Claim(s) *1-11,13 and 14* is/are allowed.

7)☒ Claim(s) *12,15-20,22 and 32* 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 *8-5-14* 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).

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)).

** 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/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application is being examined under the pre-AIA first to invent provisions.

Reissue Applications

For reissue applications filed before September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the law and rules in effect on September 15, 2012. Where specifically designated, these are “pre-AIA” provisions.

For reissue applications filed on or after September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the current provisions.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 24, 2016 has been entered.

Priority

US Patent 8,236,145 (hereafter referred to as “The ‘145 Patent”) claimed priority to US Provisional application No. 61/120,296 filed on Dec. 5, 2008. The Application Data Sheet submitted December 29, 2015 correctly states the domestic priority claim.

Status of the Claims

Original claims 1-14 from the ‘145 Patent are presented.

New claims 15-20, 22 and 32 are proposed to be added by present reissue.

New claims 21 and 23-31 have been canceled.

Claim Construction

All of the independent claims 1, 12 and 13 require a “heat exchange component” having an inlet. The ‘145 Patent notes in col. 5, lines 39-47 that the meaning of each term used therein should be given the meaning understood by the Ordinary Artisan. In col. 6, lines 1-3, “engine heat exchange component” is stated to refer to an engine radiator, heater core or other device for exchanging heat in an engine. Patent Owner’s remarks submitted May 24, 2016 pages 6 and 7 profess the intention for the term “engine heat exchange component" to be broader than a radiator and to include other devices to exchange heat in an engine. Therefore, “engine heat exchange component” will be considered to include any device exchanging heat in an engine.

In col. 6, lines 52-55, the '145 Patent says: “The specific inlet connection 16 varies by vehicle make, model and model year, but the inlet 17 is generally understood to refer to the vicinity of where hot water coming directly from the engine enters into the radiator 11.” Patent Owner’s remarks submitted May 24, 2016 on page 7 profess the intention for the term inlet to indicate an opening in the wall of the heat exchange component through which hot water from the engine flows. Therefore, the “inlet" will be

considered to mean an opening in the wall of the heat exchange component through which hot water from the engine flows.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 18 and 20 are rejected under 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

Claim 18 recites the limitation "the radiator" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 20 recites the limitation “is within 10 inches of the center of an inlet thereof” in lines 2-3. An inlet was already discussed in claim 12 from which claim 20 depends. Furthermore, a claim must be a single complete sentence. The phrase starting with “is” appears to be modifying the “adding or installing” to further limit “adjacent an inlet thereof. However, the “is” could be modifying the fluid flow, the heat exchange component or one of adding or installing. It is believed that the word “is” should be deleted to clarify the claim scope.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 12, 18, 19 and 32 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Watanabe et al. (US 6,109,987).

With regard to claim 12, Watanabe teaches an outboard motor with cylinder block and exhaust manifold cooling jackets (see abstract and col. 6, line 64 to col. 7, line 4). Cooling jackets are being considered to lie within the broadest reasonable interpretation of “engine heat exchange component.” Col. 7, lines 31-46 teach a sacrificial anode 91 "at the point where the water will first come into contact with the exhaust manifold". However, protection anodes 92 are located near where water heated by the exhaust manifold enters the cylinder block's cooling jacket as seen in figure 6. Therefore, Watanabe teaches at least one cooling jacket being a heat exchange component which has sacrificial or protection anodes located adjacent the inlet thereof.

With regard to claim 18, “the radiator” has no antecedent basis in claim 18 or claim 12 and will be interpreted to be the heat exchange component of claim 12. As such, the installation of the sacrificial anode in a fitting hole adjacent an inlet thereof is evident in figure 6 of Watanabe et al.

With regard to claim 19, Watanabe et al. mounts anodes into openings in the cylinder block which would inherently be grounding the anode to the vehicle in which the motor is being used.

With regard to claim 32, Watanabe et al.'s description of fluid flow paths in col. 7, line 4 and their illustration in figures 3 and 6 would anticipate the anode assembly to be within the fluid flow path of the heat exchange assembly.

Claims 12, 15, 20 and 32 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Gush (US 1,514,903).

With regard to claims 12 and 15, Gush teaches a radiator having an anticorrosion electrode bar extending across the top of the radiator (see figures 1-3 and page 1, lines 90-104 and page 2, lines 12-19 and 35-44). Gush also teaches the application of an anticorrosion electrode to a cooling water manifold (page 2, lines 20-29). The top ("L") of a downflow radiator or the cooling water manifold ("O") through which hot water was known to flow from an engine into a radiator is taught by Gush to contain anticorrosion electrodes at their centers. Figure 5 of Gush shows electrode P centered between two fluid openings in a triangular shaped manifold. Clearly, the shape of the manifold is dictated by the flow of cooling water downward under the force of gravity from the two upper openings to the single lower opening. Therefore, the electrode P is adjacent the inlet opening of the manifold.

With regard to claim 20, the electrode P of Gush is effectively located at the center of the inlet as illustrated in figure 5.

With regard to claim 32, Gush figure 5 would anticipate the anode assembly to be within the fluid flow path of the manifold.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 16, 17 and 22 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Gush in view of Green (US 5,649,591).

With regard to claims 16 and 17, Gush does not teach that the electrode consists essentially of active metal or aluminum, magnesium or zinc. Green specifically teaches sacrificial anodes of zinc, magnesium or aluminum alloy in col. 2, lines 40-44. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use aluminum, magnesium or zinc or other active metals in the sacrificial anodes of Gush because Green teaches their known utility in radiators for engines.

With regard to claim 22, Gush does not teach that the radiator or cooling manifold comprises one or more aluminum components. Gush was published prior to the availability of aluminum to make such articles. The problem of electrolytic activity in the presence of aluminum components are discussed by Green in col. 1, lines 33-39 and sacrificial anodes are discussed for solving the problem in col. 1, lines 46-52. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the known sacrificial anode method of Gush to an aluminum containing radiator or cooling manifold because Green explains the utility of incorporating sacrificial anodes into modern aluminum-containing devices.

Response to Arguments

Applicant's arguments with respect to claims 12 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

Conclusion

Claims 12, 15-20 and 32 are rejected.

Claims 1-11, 13 and 14 are allowable.

Applicant is reminded of the continuing obligation under 37 CFR 1.178(b), to timely apprise the Office of any prior or concurrent proceeding in which Patent No. 8,236,145 is or was involved. These proceedings would include interferences, reissues, reexaminations, and litigation.

Applicant is further reminded of the continuing obligation under 37 CFR 1.56, to timely apprise the Office of any information which is material to patentability of the claims under consideration in this reissue application.

These obligations rest with each individual associated with the filing and prosecution of this application for reissue. See also MPEP §§ 1404, 1442.01 and 1442.04.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN E. VINCENT whose telephone number is (571)272-1194. The examiner can normally be reached on M-F 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Stein can be reached on (571) 272-1544. 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.

/SEAN E VINCENT/
Patent Reexamination Specialist
Central Reexamination Unit 3991
Conferees:

/ TERRENCE TILL /
Patent Reexamination Specialist
Central Reexamination Unit 3991

/TIMOTHY SPEER/
Supervisory Patent Reexamination Specialist
Central Reexamination Unit 3991

Notice of References Cited	Application/Control No. 14/452,339	Applicant(s)/Patent Under Reexamination PETROSINO, FRANK	
	Examiner SEAN E. VINCENT	Art Unit 3991	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6,109,987 A	08-2000	Watanabe; Hitoshi	F01P3/205	134/166R
	B	US-				
	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	CPC Classification
	N					
	O					
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	T					

NON-PATENT DOCUMENTS

*		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.

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S55	1824	sacrificial near2 anode	USPAT	OR	ON	2017/08/11 09:40
S56	328438	(radiator or (heat adj exchanger) or condenser)	USPAT	OR	ON	2017/08/11 09:40
S58	125	S55 and S56 and (mount or mounting or plug or attach or install or hang or holder or fitting)	USPAT	OR	ON	2017/08/11 09:41
S59	2400553	(mount or mounting or plug or attach or install or hang or holder or fitting)	USPAT	OR	ON	2017/08/11 09:43
S60	125	S55 and S56 and S59	USPAT	OR	ON	2017/08/11 09:43
S61	87	S60 and @pd<="20081201"	USPAT	OR	ON	2017/08/11 09:45
S62	1824	sacrificial near2 anode	USPAT	OR	ON	2017/08/11 14:28
S63	328438	(radiator or (heat adj exchanger) or condenser)	USPAT	OR	ON	2017/08/11 14:28
S64	2400553	(mount or mounting or plug or attach or install or hang or holder or fitting)	USPAT	OR	ON	2017/08/11 14:28
S65	125	S62 and S63 and S64	USPAT	OR	ON	2017/08/11 14:28
S66	87	S65 and @pd<="20081201"	USPAT	OR	ON	2017/08/11 14:28
S67	38	S65 not S66	USPAT	OR	ON	2017/08/11 14:28

8/18/2017 5:09:40 PM
C:\Users\svincent\Documents\EAST\Workspaces\14452339.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14452339	PETROSINO, FRANK
	Examiner	Art Unit
	SEAN E VINCENT	3991

CPC- SEARCHED		
Symbol	Date	Examiner
see EAST search history	6-10-15	SV
above up to date	2-9-16	SV

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
see EAST search history	6-10-15	SV
prior prosecution and patent family reviewed	6-10-16	SV
above up to date	2-9-16	SV
SEE EAST SEARCH HISTORY	8-17-17	SV

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

Receipt date: 05/24/2016

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	14452339
Filing Date	2014-08-05
First Named Inventor	Frank Petrosino
Art Unit	3991
Examiner Name	Sean E. Vincent
Attorney Docket Number	PET744/4-001REUS/58000

U.S.PATENTS Remove

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	~~1514903~~		~~1924-04-18~~	~~Cush~~	
	2	4776392	A	1988-10-11	Loyd	
	3	5292595	A	1994-03-08	Yamauchi, et al.	
	4	5649591	A	1997-07-22	Green	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /SV/

Receipt date: 05/24/2016

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14452339
	Filing Date	2014-08-05
	First Named Inventor	Frank Petrosino
	Art Unit	3991
	Examiner Name	Sean E. Vincent
	Attorney Docket Number	PET744/4-001REUS/58000

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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[5]
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EXAMINER SIGNATURE

Examiner Signature	/Sean E Vincent/	Date Considered	08/10/2017

*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.

[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.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Sep 05, 2017 03:51:30 AM

Dear PAIR Customer:

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Application	Document	Mailroom Date	Attorney Docket No.
14452339	CTNF	09/05/2017	PET744/4-001REUS/58000
	892	09/05/2017	PET744/4-001REUS/58000
	1449	09/05/2017	PET744/4-001REUS/58000

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Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Frank Petrosino	Group Art Unit: 3991
Serial No.: 14/452,339, Reissue of U.S. Patent No. 8,236,145	Specialist: Vincent, Sean E.
Filed: August 5, 2014	Atty. Dkt. No.: PET744/58000
For: ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE	Confirmation No.: 7313

RESPONSE TO NON FINAL OFFICE ACTION OF SEPTEMBER 5, 2017

VIA EFS WEB

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

Sir:

The current paper is filed in in response to a Non Final Office Action of September 5, 2017.

Charge any necessary fees to Vinson & Elkins L.L.P. Deposit Account No. 220365/PET744/58000.

Amended claims begin on page 2.

Remarks begin on page 5.

Reconsideration of the claims is respectfully requested.

Amendments to the Claims

1. (original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of aluminum.

3. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of magnesium.

4. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of zinc.

5. (original) The electrolysis prevention device of claim 1 wherein the sacrificial node is grounded to a vehicle.

6. (original) The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. (original) The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. (original) The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. (original) The electrolysis prevention device of claim 1 wherein the wherein the engine heat exchange component is a heater core.

10. (original) A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. (original) A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. (original) A method of preventing corrosion of an engine heat exchange component comprising adding or installing a sacrificial anode assembly within the heat exchange component adjacent an inlet thereof.

13. (original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. (original) An engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

15. (previously presented) The method of claim 12, wherein said engine heat exchange component is a radiator.

16. (previously presented) The method of claim 15, wherein said sacrificial anode consists essentially of an active metal.

17. (previously presented) The method of claim 16, wherein said sacrificial anode consists essentially of aluminum, magnesium, or zinc.

18. (currently amended) The method of claim 12, wherein said sacrificial anode is added or installed in a fitting hole in a radiator adjacent to said inlet.

19. (previously presented) The method of claim 12, wherein said sacrificial anode is grounded to said motor vehicle.

20. (currently amended) The method of claim 12 comprising adding or installing a sacrificial anode assembly within the fluid flow of the heat exchange component within 10 inches of the center of an inlet thereof.

21. (canceled)

22. (previously presented) The method of claim 12, wherein said engine heat exchange component comprises one or more aluminum components.

23. – 31. (canceled)

32. (previously presented) The method of claim 12, wherein the sacrificial anode is installed or added into the heat exchange component within the fluid flow of the heat exchange component.

Remarks

Status of the Claims

Claims 1-11, 13 and 14 are allowed.

Claims 12, 15-20, 22 and 32 are rejected.

Claim 18 is amended to substitute "a radiator for "the radiator."

Claim 20 is amended to delete the term "is."

Claims 1-20, 22 and 32 are pending in the reissue application.

Rejections Under 35 USC §112

Claims 18 and 20 are rejected for indefiniteness. The claims have been amended to address the rejections.

Withdrawal of the rejections under §112 is respectfully requested.

Rejections Under 36 USC §102

Claims 12, 18, 19 and 32 are rejected under §102(b) as allegedly anticipated by Watanabe (US 6,109,987). Patent Owner respectfully traverses in that Watanabe does not describe or suggest each and every element of any of the rejected claims.

Patent Owner finds no description or suggestion in Watanabe that a sacrificial anode is located near an inlet within the heat exchange component adjacent an inlet thereof, wherein the inlet through which hot water from the inlet flows.

The only inlet for coolant described in Watanabe is the inlet 75 in which uncooled water from the body of water in which the motor is operating enters the engine cylinder block.

> As seen in FIGS. 2, 5, and 6, at the point where the cooling water first enters the cylinder block 37 from the conduit 75 and is transferred immediately through the cooling jacket pocket 76, there is provided a sacrificial anode 92 of any known type for corrosion

> protection at the point where the water will first come into contact with the exhaust manifold cooling jacket portion 77. Thus , the exhaust manifold, which may be formed in part from a cover plate that may be formed from a a material other than that of the cylinder block, i.e., the plate 88, will be subject to galvanic protection. (Watanabe, Col 7, lns 32-40)

Watanabe describes an anode placed near the inlet where cool water flows into the engine in contrast to the claimed invention in which an anode is placed in a heat exchange component where hot water flows from the engine into a heat exchange component. Watanabe thus teaches away from the claimed invention and can in no way teach or suggest Patent Owner's claims. Watanabe in fact, does not describe any heat exchange component that is separate from the engine into which hot water from the engine flows. Rather, the hot water from the engine flows through an outlet that is open to the environment, not into a heat exchange component. Watanabe cannot therefore, be said to teach or suggest the subject matter of any of claims 12, 18, 19 or 32.

Claim 18 is even further distinguished from Watanabe since there is no description in Watanabe of a radiator on or connected to the described outboard motor. Watanabe can therefore, in no way teach or describe the subject matter of claim 18.

Neither does Watanabe inherently describe a sacrificial anode grounded to a vehicle as in claim 19. Patent Owner asserts that many boats that use outboard motors are constructed of wood, fiberglass, or a combination thereof, and the Action makes no attempt to describe how an anode inside the engine block could be grounded to such a boat. Neither does the Watanabe reference make any such attempt.

Patent Owner respectfully requests, therefore, that all rejections over Watanabe be immediately withdrawn.

Claims 12, 15, 20 and 32 are rejected under §102 as allegedly anticipated by Gush (US 1,514,903). Patent Owner respectfully traverses as the rejections are based on nothing more than conclusory statements with no support from the Gush reference.

Patent Owner asserts that Gush does not describe an inlet into a radiator nor any relationship of an inlet with a sacrificial anode. The reference, therefore cannot anticipate any claim. Neither can the reference suggest any of Patent Owner's claims. The electrode device as

shown in Figs. 4 and 5 of Gush, for example, appears to be located near a typical opening for a radiator cap. This opening is more likely to be for adding cold water rather than an inlet for hot water from an engine. The Action offers no explanation or reasoning why one of skill in this art would consider this an inlet opening for hot water. Neither is there any description or rendering of such an opening in Figures 1 and 2 or the descriptions thereof in the specification.

Patent Owner asserts, therefore, that the rejections are based on mere conclusory statements used in an attempt to reconstruct Patent Owner's claims in hindsight.

Patent Owner requests, therefore, that all rejections over Gush be immediately withdrawn.

Rejections Under 35 USC §103

Claims 16, 17 and 22 are rejected as obvious over Gush in view of Green (US 5,649,591). Patent Owner respectfully traverses.

Green appears to describe only a sacrificial anode located in the radiator cap rather than near an inlet for hot water from an engine. Green is therefore cumulative to Gush and in no way overcomes the deficiencies of Gush as described above.

Patent Owner respectfully requests, therefore, that the obviousness rejections be withdrawn.

Conclusion

Patent Owner submits that all the Examiner's concerns have been fully addressed and the claims are believed to be in the correct format for immediate allowance and reissue. Patent Owner respectfully requests an indication of such favorable action.

Respectfully submitted,

/Timothy S. Corder/

Timothy S. Corder
Reg. No. 38,414
Agent for Patent Owner

Vinson & Elkins L.L.P.
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1001 Fannin Street, Suite 2500
Houston, TX 77002-6760
512.542.8446
Date: December 27, 2017

Electronic Patent Application Fee Transmittal	
Application Number:	14452339
Filing Date:	05-Aug-2014
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Filer:	Timothy S. Corder/Bobbie Melder
Attorney Docket Number:	PET744/4-001REUS/58000
Filed as Small Entity	
Filing Fees for Utility under 35 USC 111(a)	

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($)
Extension - 1 month with $0 paid	2251	1	100	100
Miscellaneous:				
		Total in USD ($)		**100**

Electronic Acknowledgement Receipt	
EFS ID:	31345534
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Timothy S. Corder/Bobbie Melder
Filer Authorized By:	Timothy S. Corder
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	27-DEC-2017
Filing Date:	05-AUG-2014
Time Stamp:	16:03:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$100
RAM confirmation Number	122817INTEFSW00002073220365
Deposit Account	220365
Authorized User	Bobbie Melder
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 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	20171227Response.pdf	3523653 4a1ce6bc7f3c4dfff01ee646cf78720999522c25	no	8
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30618 cca5096acf294cc00728e4132cf70c9f8ce06b0d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3554271		

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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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 14/452,339	Filing Date 08/05/2014	☐ To be Mailed

ENTITY: ☐ LARGE ☐ SMALL ☒ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	12/27/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 22	Minus	** 22	= 0	X $20 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $105 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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.

LIE
RHONDA BELL

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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000	7313

21586 7590 03/07/2018

VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

EXAMINER
VINCENT, SEAN E

ART UNIT	PAPER NUMBER
3991	

NOTIFICATION DATE	DELIVERY MODE
03/07/2018	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):

IPTLdocket@velaw.com
sbrown@velaw.com
ggoel@velaw.com

Office Action Summary	Application No. 14/452,339	Applicant(s) PETROSINO, FRANK	
	Examiner SEAN E. VINCENT	Art Unit 3991	AIA (First Inventor to File) Status No

-- 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* MONTHS 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 *12-27-17*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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) *1-20,22 and 32* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☒ Claim(s) *1-11,13 and 14* is/are allowed.

7)☒ Claim(s) *12,15-20,22 and 32* 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 *8-5-14* 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).

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)).

** 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/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application is being examined under the pre-AIA first to invent provisions.

Reissue Applications

For reissue applications filed before September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the law and rules in effect on September 15, 2012. Where specifically designated, these are "pre-AIA" provisions.

For reissue applications filed on or after September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the current provisions.

Priority

US Patent 8,236,145 (hereafter referred to as "The '145 Patent") claimed priority to US Provisional application No. 61/120,296 filed on Dec. 5, 2008. The Application Data Sheet submitted December 29, 2015 correctly states the domestic priority claim.

Status of the Claims

Original claims 1-14 from the '145 Patent are presented.

New claims 15-20, 22 and 32 are proposed to be added by present reissue.

New claims 21 and 23-31 have been canceled.

Claim Construction

All of the independent claims 1, 12 and 13 require a "heat exchange component" having an inlet. The '145 Patent notes in col. 5, lines 39-47 that the meaning of each

term used therein should be given the meaning understood by the Ordinary Artisan. In col. 6, lines 1-3, “engine heat exchange component” is stated to refer to an engine radiator, heater core or other device for exchanging heat in an engine. Patent Owner’s remarks submitted May 24, 2016 pages 6 and 7 profess the intention for the term “engine heat exchange component" to be broader than a radiator and to include other devices to exchange heat in an engine. Therefore, “engine heat exchange component” will be considered to include any device exchanging heat in an engine.

In col. 6, lines 52-55, the '145 Patent says: “The specific inlet connection 16 varies by vehicle make, model and model year, but the inlet 17 is generally understood to refer to the vicinity of where hot water coming directly from the engine enters into the radiator 11.” Patent Owner’s remarks submitted May 24, 2016 on page 7 profess the intention for the term inlet to indicate an opening in the wall of the heat exchange component through which hot water from the engine flows. Therefore, the “inlet" will be considered to mean an opening in the wall of the heat exchange component through which hot water from the engine flows.

Claim Rejections - 35 USC § 112

Previous rejections are withdrawn in light of the most recent amendments.

Claim 19 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and

distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim 19 recites the limitation "said motor vehicle" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 12, 15-19 and 32 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Gou Zhangeng (CN1225998, hereafter "Gou").

With regard to claims 12 and 15, Gou teaches a radiator 1 with a sacrificial anode 3 mounted on a bleed valve 4, both of which are located near the upper inlet of the radiator through a hole fitted for the bleed valve (see figure 1 and the machine translation of page 2 of the Chinese patent).

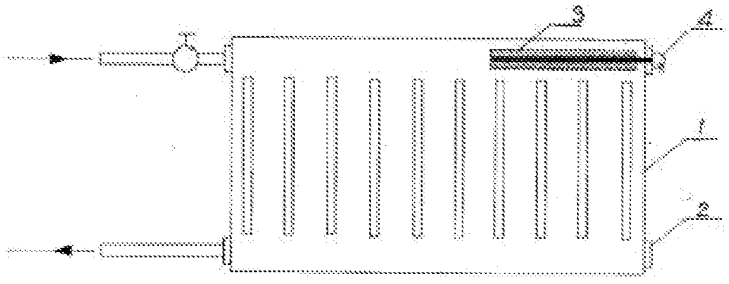


图 1

With regard to claims 16 and 17, Gou claim 4 anticipates a magnesium anode.

With regard to claim 18, the hole in the radiator of Gou anticipates the claimed requirement for said sacrificial anode to be installed in a fitting hole in a radiator adjacent to said inlet.

With regard to claim 19, the Gou anode being mounted in a hole in a radiator made of steel would necessarily make the anode grounded to a motor vehicle using said radiator for heat exchange.

With regard to claim 32, Gou figure 1 would anticipate the anode assembly to be within the fluid flow path of the radiator.

Claims 12, 19 and 32 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Watanabe et al. (US 6,109,987).

With regard to claim 12, Watanabe teaches an outboard motor with cylinder block and exhaust manifold cooling jackets (see abstract and col. 6, line 64 to col. 7, line 4). Cooling jackets are being considered to lie within the broadest reasonable interpretation of “engine heat exchange component.” Col. 7, lines 31-46 teach a sacrificial anode 91 "at the point where the water will first come into contact with the exhaust manifold". However, protection anodes 92 are located near where water heated by the exhaust manifold enters the cylinder block's cooling jacket as seen in figure 6. Therefore, Watanabe teaches at least one cooling jacket being a heat exchange component which has sacrificial or protection anodes located adjacent the inlet thereof.

With regard to claim 19, Watanabe et al. mounts anodes into openings in the cylinder block which would inherently be grounding the anode to the vehicle in which the motor is being used.

With regard to claim 32, Watanabe et al.'s description of fluid flow paths in col. 7, line 4 and their illustration in figures 3 and 6 would anticipate the anode assembly to be within the fluid flow path of the heat exchange assembly.

Claims 12, 15, 20 and 32 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Gush (US 1,514,903).

With regard to claims 12 and 15, Gush teaches a radiator having an anticorrosion electrode bar extending across the top of the radiator (see figures 1-3 and page 1, lines 90-104 and page 2, lines 12-19 and 35-44). Gush also teaches the application of an anticorrosion electrode to a cooling water manifold (page 2, lines 20-29). The top ("L") of a downflow radiator or the cooling water manifold ("O") through which hot water was known to flow from an engine into a radiator is taught by Gush to contain anticorrosion electrodes at their centers. Figure 5 of Gush shows electrode P centered between two fluid openings in a triangular shaped manifold. Clearly, the shape of the manifold is dictated by the flow of cooling water downward under the force of gravity from the two upper openings to the single lower opening. Therefore, the electrode P is adjacent the inlet opening of the manifold.

With regard to claim 20, the electrode P of Gush is effectively located at the center of the inlet as illustrated in figure 5.

With regard to claim 32, Gush figure 5 would anticipate the anode assembly to be within the fluid flow path of the manifold.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 22 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Gou in view of Green (US 5,649,591).

With regard to claim 22, Gou does not teach that the radiator or cooling manifold comprises one or more aluminum components. The problem of electrolytic activity in the presence of aluminum components are discussed by Green in col. 1, lines 33-39 and sacrificial anodes are discussed for solving the problem in col. 1, lines 46-52. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the known sacrificial anode method of Gou to an aluminum containing radiator because Green explains the utility of incorporating sacrificial anodes into modern aluminum-containing devices.

Response to Arguments

Applicant's arguments directed to the 35 USC §102 and §103 submitted December 27, 2017 are not found convincing. Patent Owner asserts that Watanabe only teaches an anode placed near the cool water inlet, teaching away from the claimed

invention. This argument ignores the analysis of Watanabe set forth in the rejection. Specifically, the statement: “However, protection anodes 92 are located near where water heated by the exhaust manifold enters the cylinder block's cooling jacket as seen in figure 6. Therefore, Watanabe teaches at least one cooling jacket being a heat exchange component which has sacrificial or protection anodes located adjacent the inlet thereof. “ Patent Owner should address the supposed errors in the entire rejection, not just portions of it.

Arguments regarding Watanabe’s applicability to claim 18 are moot in view of the amendment to claim 18 and the new rejection of claim 18.

In response to the argument that Watanabe doesn’t describe a sacrificial anode grounded to the claimed motor vehicle, the examiner disagrees. Where a motor vehicle consists of a boat, the concept and purpose of grounding only extends to portions of the boat which could serve as an electrical ground, i.e. the metal from which the motor and the cooling jacket are made. A wooden or fiberglass boat hull would not serve as an electrical ground in the context of the prevention of galvanic corrosion with a sacrificial anode.

In response to the argument that the rejection offers no explanation or reasoning why one of skill in the art would consider the opening of Gush to be an inlet for hot water, the examiner disagrees. The rejection states: “Clearly, the shape of the manifold is dictated by the flow of cooling water downward under the force of gravity from the two upper openings to the single lower opening. Therefore, the electrode P is adjacent the inlet opening of the manifold.”

Arguments regarding the Gush in view of Green rejection of claims 16, 17 and 22 rely on the supposed lack of teaching in Gush. Gush's teaching is re-emphasized above. The Patent Owner has not argued why Green is not combinable with Gush or vice versa.

This office action is NON-FINAL.

Conclusion

Claims 12, 15-20 and 32 are rejected.

Claims 1-11, 13 and 14 are allowable.

Applicant is reminded of the continuing obligation under 37 CFR 1.178(b), to timely apprise the Office of any prior or concurrent proceeding in which Patent No. 8,236,145 is or was involved. These proceedings would include interferences, reissues, reexaminations, and litigation.

Applicant is further reminded of the continuing obligation under 37 CFR 1.56, to timely apprise the Office of any information which is material to patentability of the claims under consideration in this reissue application.

These obligations rest with each individual associated with the filing and prosecution of this application for reissue. See also MPEP §§ 1404, 1442.01 and 1442.04.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN E. VINCENT whose telephone number is (571)272-1194. The examiner can normally be reached on M-F 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Stein can be reached on (571) 272-1544. 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.

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Patent Reexamination Specialist
Central Reexamination Unit 3991
Conferees:

/ TERRENCE TILL /
Patent Reexamination Specialist
Central Reexamination Unit 3991

/JEAN WITZ/
Supervisory Patent Reexamination Specialist
Central Reexamination Unit 3991

Notice of References Cited	Application/Control No. 14/452,339	Applicant(s)/Patent Under Reexamination PETROSINO, FRANK	
	Examiner SEAN E. VINCENT	Art Unit 3991	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
b	A	US-				
	B	US-				
	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	CPC Classification
	N	H10246595A	09-1998	Japan	Ichihara Takayuki	F28D9/0043
	O	1225998A	08-1999	China	Guo Zhangeng	F28D1/03
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NON-PATENT DOCUMENTS

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	U	Notifcation of Reason for Refusal, Korean Intellectual Property Office, application 10-2008-0038583, 4 pages, 4-2011.
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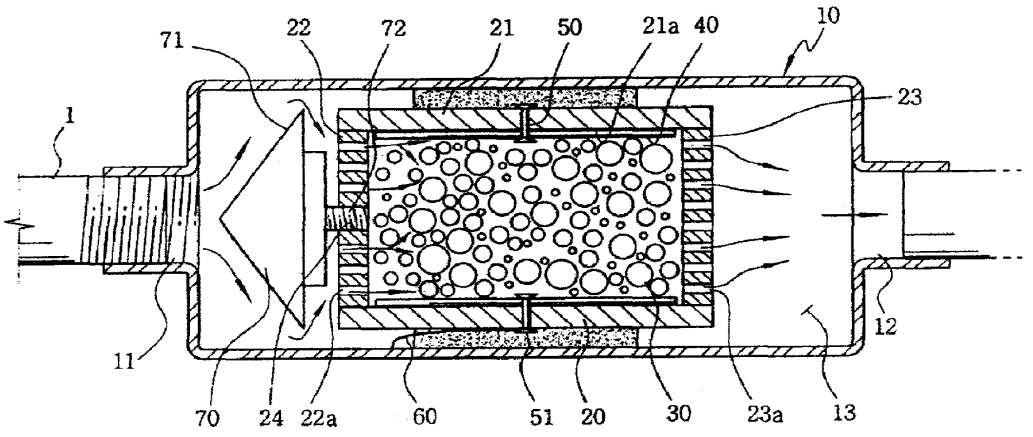
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(54) **Title:** WATER DISPOSAL PLANT



(57) **Abstract:** There is provided a water disposal plant which converts the water flowing through a pipe of a boiler or a vehicle and the water reserved in a fish globe or a fresh water container into an alkaline deoxidation water, prevents generation of a scale in a pipe and erosion, and improves fuel ratio by installing it in a fuel tank of a vehicle, a boiler, or the like. The water disposal plant comprises a pipe body having a cylindrical body portion ,in which porous plates are installed at both side surfaces of the body portion to pass the water, cathode generating bodies of granule type which makes contact with the water passing through the pipe body to generate the doexidationpotentialization and in which the filling amount thereof into the pipe body can be regulated, at least two high negative electricity generating bodies having a bar shape and installed lengthwisely on the wall surface of the pipe body, connecting bodies which fix the high negative electricity generating bodies to the wall surfaces of the pipe body, and an induction body installed in the front side porous plates of the pipe body.

WO 2005/061393 A1

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Description

WATER DISPOSAL PLANT

[1] Technical Field

[2] The present invention relates to a water disposal plant, and more particularly, to a water disposal plant which converts the water flowing through a pipe of a boiler or a vehicle and the water reserved in a fish globe or a fresh water container into an alkaline deoxidation water, and prevents generation of a scale in a pipe and erosion, and improves fuel ratio by installing it in a fuel tank of a vehicle, a boiler, or the like.

[3] Background Art

[4] In general, in a closed passage through which the water flows, i.e., in a pipe body which is installed in an equipment or a mechanical device to supply and discharge the water continuously and repeatedly, various mineral matters and elements contained in the water reacts mutually, and thus erosions and a large amount of scales are generated.

[5] The erosion and the scales damage a pipe body, and obstruct the flow of the water, and bring about a mechanical disorder, and influence a human body who uses the machine.

[6] For example, in case erosions and scales are generated in a pipe of a boiler, since water supply and drainage are not efficiently performed, the thermal efficiency is lowered and the heating effect is deteriorated and foreign substances contained in the warm water injured a human body.

[7] Therefore, recently various water disposal plants have been developed to minimize erosion of a pipe and generation of scales. Ordinarily, such a plant uses electromagnetism, magnetism, electrolysis, and so forth, or a physical method. The brief explanation of such a technology is as follows.

[8] Firstly, in a general water disposal plant, a positive and negative ion exchange resin is widely used. For example, if the water is passed through the ion exchange resin, the ion exchange resin converts the harmful calcium or magnesium to a natrium salt. However, from the natrium consumption point of view, such a device is not suitable for a beverage. Such a device needs maintenance and repair.

[9] A device which uses magnetism uses an electromotive force induced when the water which is an electric medium is passed through a magnetic field. However, the effect of the device is not predictable and is variable.

[10] A chemical method in which chemicals of silicic acid and phosphate are injected

into a pipe and a physical method in which the water of high pressure is sprayed or sands are sprayed at high speeds to remove scales have been used. However, according to the physical and chemical method, the pipe is damaged, and the process is complex, and a washing process should be performed again.

[11] Disclosure of the Invention

[12] The present invention solves the problems of the prior art, and it is an object of the present invention to provide a water disposal plant which minimizes main substances of scales and dioxidates the water into a alkaline or soft water by using the potential difference generated between a metal and a solution, and which can regulate the contacting area and time of the water and a cathode generating body for effective potentialization under the most suitable condition.

[13] Another object of the present invention is to provide a water disposal plant which prevents erosion and generation of a scale by using a single pole potential to supply and discharge water smoothly and to reduce the mechanical disorder and to reduce the energy consumption and to prevent environmental contamination and to enable the long-term use of a pipe body.

[14] Another object of the present invention is to provide a water disposal plant which is installed in a fuel tank of a vehicle or a boiler to increase the amount of hydrogen by deoxidation potential of the water mixed in a fuel, thereby to improve the output of an engine, and thereby reducing the energy consumption and the fuel ration efficiency. The water disposal plant of the present invention prevents foreign substances from being adhered to an engine or pipe passages through the fuel of a vehicle is supplied, and thus maintains cleanness.

[15] The present invention is applied to a passage of a mechanical equipment and can be widely applied to a reservoir, a fresh water container, a fuel tank of a vehicle or a boiler, or the like.

[16] In order to accomplish the objects of the present invention, the present invention provides a water disposal plant which prevents erosion and generation of a scale and converts the water into the alkaline water or the soft water by using deoxidationpotentialization which uses potential difference between the water and a metal, which comprises: a pipe body having a cylindrical body portion, in which porous plates are installed at both side surfaces of the body portion to pass the water; cathode generating bodies of granule type which makes contact with the water passing through the pipe body to generate the deoxidationpotentialization and in which the filling amount thereof into the pipe body can be regulated; at least two high negative electricity

generating bodies having a bar shape and installed lengthwisely on the wall surface of the pipe body; connecting bodies which fix the high negative electricity generating bodies to the wall surfaces of the pipe body; and an induction body installed in the front side porous plates of the pipe body, for dispersing and inducing the water induced from an water inlet towards the front side porous plate.

[17] Preferably, the water disposal plant further comprises a housing having an inner space in which the pipe body is installed and having a water inlet and a water outlet so that the water is introduced and discharged, and the pipe body is separated from the inner side wall of the housing by a predetermined distance by an interval maintaining member, and lead wires are connected to the housing and the connecting members to potentialize the negative electricity.

[18] Preferably, the cathode generating bodies are made of a mixture of zinc, copper, and silver and is formed so as to have a small regular or irregular granule shape, and the high negative electricity generating body is made of magnesium and has a bar shape of a predetermined length.

[19] Preferably, the front surface of the induction body has a cone shape to disperse and induce the water, and an interval regulating member of a screw engagement type is provided on the rear surface of the induction body to regulate the interval between the induction body and the pipe body and thus to regulate the flow rate of the water.

[20] Preferably, the pipe body is installed in a fuel tank of a vehicle or a boiler, and the water on the bottom of the tank is deoxidated by the specific gravity to increase the amount of hydrogen.

[21] Brief Description of the Drawings

[22] The above aspects and features of the present invention will be more apparent by describing certain embodiments of the present invention with reference to the accompanying drawings, in which:

[23] FIG. 1 is a front cross-sectional view of a water disposal plant of the present invention;

[24] FIG. 2 is a side cross-sectional view of a water disposal plant of the present invention;

[25] FIG. 3 is an enlarged cross-sectional view of the present invention;

[26] FIG. 4 is a cross-sectional view for showing an usage example of the water disposal plant according to the present invention; and

[27] FIG. 5 is a Pourbaix diagram about the oxidation and deoxidation of water.

[28] Best Mode for Carrying Out the Invention

[29] The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

[30] Preferably, a water disposal plant of the present invention converts the water flowing in a closed passage or the storage water into the alkaline deoxidation water, and prevents the generation of scale or erosion in the inner surface of a pipe through which the water flows and removes the scale or the erosion portion, and improves the fuel ratio by positioning it into a fuel tank of a vehicle or a boiler in a deposition type.

[31] The water disposal plant of the present invention is applied to a water supplying system, a part of an equipment, a mechanical device, or the like, and more particularly is applied to a clarifier, a aquatic plant cultivation pipe, a shower hose, a boiler pipe, a vending machine, a car washing machine and a water supplying pipe of a car wash, a dish washer, a cooling system of a vehicle, a fish globe, a fresh water container, a vehicle, and a boiler etc. to deoxidate the water into a alkaline water or a soft water and to save the energy.

[32] FIG. 1 is a front cross-sectional view of the water disposal plant of the present invention, and FIG. 2 is a side cross-sectional view of the water disposal plant of the present invention.

[33] Basically, the water disposal plant 1 of the present invention, includes a pipe body 20, cathode generating bodies 30 of granule type which are filled in the pipe body 20, high negative electricity generating bodies 40 which are installed on the wall surface of the pipe body 20, and connecting bodies 50 which fixes the high negative electricity generating bodies 40 to the pipe body 20.

[34] Here, the pipe body 20 is installed in the inner side of the housing 1 which facilitates the connection when it is installed in a pipe passage, i.e., when it is connected to a water supply pipe 1, and provides a flowing passage of the water. The pipe body 20 is separated from the housing 10 by a predetermined distance, and an interval maintaining member 24 is positioned between them. A lead wire 60 is installed between the housing 1 and the connecting member 50 so that the negative electricity is potentialized.

[35] The housing 10 has a pipe type, and has a water inlet 11 and water outlet 12 which are connected to a pipe body of the water supply pipe 1 or a mechanical equipment.

The space between the water inlet 11 and the water outlet 12 is empty so that the passage inducing the water flow can be formed and the pipe body 20 can be installed. As shown in the figures, screw threads are formed on the inner and outer surfaces of the water inlet 11 and the water outlet 12 to facilitate the connection with the water supply pipe 1, and can be fused to the water supply pipe 2.

[36] Preferably, the housing 10 is made of aluminum, and can be made of another metal such as a stainless steel. The housing 10 should have a suitable strength and hardness to endure the exterior impact, and should have a chemical resistance.

[37] The pipe body 20 includes a circular body portion 21 and porous plates 22 and 23 installed at the both side end portions thereof. A plurality of introducing holes 22a through which the water is flowed are punched in the front side porous plate 22, and a regulating hole 24 in which an induction body is assembled is formed in the center portion. A plurality of discharging holes 23a are punched in the rear side porous plate 23.

[38] The body portion 21 is made of an alloy of zinc, copper, and silver, and can be manufactured of magnesium and so forth. The porous plates 22 and 23 is made of a synthetic resin or magnesium or a mixture of them, and the mixing rate and the material can be differentiated according to various installing conditions of the present invention.

[39] On the other hand, the pipe body 20 is separated by a predetermined distance from the housing 10 by the interval maintaining member 24, and the interval maintaining member 24 is made of a nonconductor. The interval maintaining member 24 made of a nonconductor prevents the direct contact of the body portion 21 of the pipe body 20 and the housing 10, and thus prevents the access potentialization of the negative electricity. Since the center portion of the housing 10 is blocked to divide it into the inlet side and the outlet side, the water which is not deoxidated into the alkaline water or the soft water is prevented form being flowed outwardly.

[40] The cathode generating bodies 30 is a granule type of a predetermined size, and is made of an alloy in which zinc, copper, and silver is mixed at a predetermined ratio. Here, the cathode generating bodies 30 of granule type is filled in the pipe body 20 to maximize the area and time of the water flow contact, and to effectively remove and prevent the scale by regulating the filling amount of the cathode generating bodies 30 according to the condition.

[41] The high negative electricity generating bodies 40 are made of a magnesium bar, and can be manufactured of another metal, for example, an alloy of copper, zinc, and

silver. Then, considering the material of the body portion, the high negative generating bodies 40 should made of a material which can generate higher negative electricity than the body portion.

[42] Each of the high negative electricity generating bodies has a bar type which is rather short than the length of the body portion, and firmly fixed to the inner side wall 21a of the body portion 21 of the pipe body 20. The number of the high negative electricity generating bodies 40 is at least three, and the high negative electricity generating bodies 40 is radially installed on the inner side wall 21a of the body portion 21. Each of the connecting bodies 50 is a rod type, and has head portions 51 at both ends thereof. The head portions 51 are installed by riveting or by separately manufacturing them, and are connected to lead wires 60 connected to the housing 10.

[43] The lead wire 60 potentializes the negative electricity to the housing 10, and transfers the negative electricity to the water contained in the interior of the housing 10.

[44] An induction body 70 assembled to the side surface porous plate 22 has a front surface of cone type, and disperses and induces the water flowed inwardly from the water inlet 11, and introduces the water through the porous plates 22 through the aperture between the induction body 70 and the porous plates 22.

[45] The induction body 70 has a conic surface 71 which has a front surface of cone type, and disperses the water along the conic surface. The interval regulating member 72 which can regulate the separation distance from the porous plates 22 is positioned on the rear surface of the induction body 70. On the other hand, the front surface of the induction body 70 need not has a conic shape as shown in the figures. The induction body 70 can has a semi-circular shape or a flat plate shape.

[46] Preferably, the interval regulating member 72 is formed in a screw engagement manner, and regulates the flow rate of the water by widening or narrowing the space formed between the porous plate 22 and the induction body 70. The flow rate is regulated according to the characteristics of a device in which the water disposal plant of the present invention to optimize the deoxidation efficiency of the water.

[47] The A in the figure represents a fresh water container, a fish globe, a fuel tank of a vehicle or a boiler.

[48] According to the present invention, by using potential differences, i.e., single pole potentials which is generated by exchanging electrons at the contact surface between the metals of the housing 10, the pipe body 20, the cathode generating bodies 30, and the high negative electricity generating bodies 40 and the solution, i.e., the water, the

main substances of the scale, i.e., Ca^{++}, Mg^{++}, and Fe^{++} is minimized so as to prevent the generation of the scale and convert the water into the alkaline deoxidation water or the soft water.

[49] For example, the main substance Ca^{++} of the scale is converted to Ca by obtaining $2e^{+}$.

[50] The water disposal plant 1 of the present invention can be applied regardless of a closed passage, e.g., a cooling device of a vehicle, a washing device, a pipe of a boiler, a vending machine, a car wash, a fresh water container, a fish globe, a vehicle, and a fuel tank of a boiler etc., the water flowing through a closed passage, the reserved water, a beverage, or a thing that is not a beverage, or a fuel.

[51] For example, in FIGS. 1 and 2, in case the water disposal plant of the present invention is connected to a water supply pipe 1, the water inlet 11 and the water outlet 12 of the housing 10 are connected to the water supply pipe 2 to pass the water. Then, the water supply pipe 2 is connected by screw engagement or socket tube type of a cap or a flange.

[52] When the water is supplied to the water disposal plant 1, the metals which comprises the present invention and contacts with the water, such as the aluminum, the copper, the zinc, and the silver, especially the magnesium which comprises the high negative electricity generating body 40, generate the single pole transition. By the single pole transition, electrons are exchanged to convert the water into an alkaline de-oxidation water.

[53] That is, $2H^{+}$ is converted into H_2 by obtaining $2e^{-}$.

[54] As above-described, the present invention uses the single pole potential, i.e., the contact potential difference. For reference, the single pole transitions of the metals applied to the present invention is as follows. Aluminum -1.66V, copper 0.34V, zinc -0.76V, and silver 0.8V.

[55] The single pole potential value is selected considering the concentration of the water and the state of the pipe with reference to the above mentioned values, and preferably a value under -0.6V is most stable.

[56] The theoretical basis of the present invention is Nernst equation, and since if the partial pressure of hydrogen is 1bar and the temperature is 25°C, E equals to -0.059×PH, a class which has a deoxidation transition lower than the value deoxidates H^{+} into H_2

$(2H^{+}+2e^{-} \rightarrow H_2)$

and the pair which has a negative metal transition value under -0.6V deoxidates the

hydrogen ions into H_2 at a sufficient speed.

[57] For reference, FIG. 5 shows a Pourbaix diagram which displays a region which is thermodynamically stable by PH values.

[58] In case the water disposal device of the present invention is applied to a pipe, the pipe body is connected with the housing. In case the water disposal device of the present invention is applied to a deposition type body such as a fresh water container and a fish globe as shown in FIG. 4, the housing is not necessary. Considering the usage and the place in which the pipe body 20 is used, the state of the electrolyte, and the state of the pipe, several plants can be connected to each other.

[59] Further, the water disposal device of the present invention can be installed in a fuel tank of a vehicle, a boiler, or the like. To prevent the fluctuation in installation, the plant can be detachably installed in the fuel tank by using fastening bands and brackets.

[60] According to the water disposal plant, since the deoxidation of the water of the bottom of the tank, i.e., of the bottom which is separated by the specific gravity is accomplished, the amount of the hydrogen is increased and foreign substances are prevented from being adhered to the fuel supplying passage.

[61] Industrial Applicability

[62] As above-described, according to the present invention, by the single pole potential, i.e., the exchange of electrons, the main substances of the scale, such as Ca^{++}, Mg^{++}, Fe^{++}, is minimized and the generation of scale and the erosion can be prevented. Further, by filling the negative electricity generating bodies of granule type in the pipe body, the contact time and area of the water flow is sufficiently provided and the deoxidation is effectively accomplished.

[63] Further, by installing the high negative electricity generating bodies on the wall surface of the pipe body, the water which flows adjacent to the wall surface of the pipe body is alkalified and the water which flows along the central portion of the pipe body is expedited to become soft water.

[64] Further, since the potentialization is accomplished by effectively regulating the filling amount the high negative electricity generating body, effective deoxidation is accomplished.

[65] The present invention enables the long-term use of the pipe body, and supplying and discharging of the water is accomplished smoothly, and the mechanical disorder is reduced. In case the present invention is applied to a boiler, the use of energy is reduced. By converting the water used in a fresh water container or a fish globe into

the alkaline deoxidation water, the water is not harmful to a fish or a human body.

[66] While the present invention has been particularly shown and described with reference to an exemplary embodiment thereof, it will be understood by those of ordinary skill in the art that various changes in form and details may be made therein without departing from the sprit and scope of the present invention as defined by the following claims.

Claims

[1] A water disposal plant which prevents the generation of erosion and scales and converts water into alkaline water or soft water by using deoxidationpotentialization which uses potential difference between the water and a metal, the water disposal plant comprising:
a pipe body having a cylindrical body portion, in which porous plates are installed at both side surfaces of the body portion to pass water;
cathode generating bodies of granule type which makes contact with the water passing through the pipe body to generate the deoxidationpotentialization and in which the filling amount thereof into the pipe body can be regulated;
at least two high negative electricity generating bodies having a bar shape and installed lengthwisely on the wall surface of the pipe body;
connecting bodies which fix the high negative electricity generating bodies to the wall surfaces of the pipe body; and
an induction body installed in the front side porous plate of the pipe body, for dispersing and inducing the water introduced from an water inlet towards the front side porous plate.

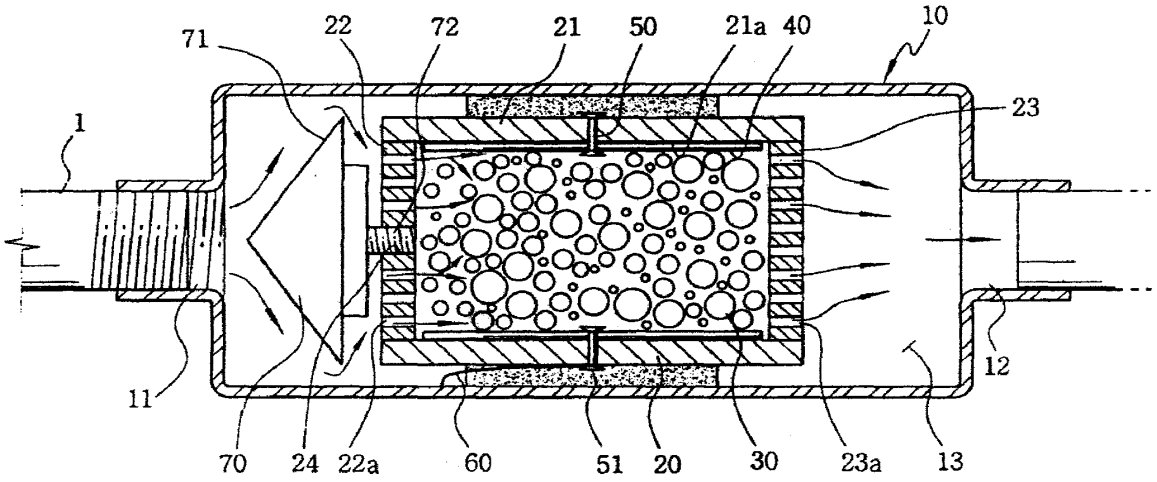
[2] The water disposal plant according to claim 1, wherein the water disposal plant further comprises a housing having an inner space in which the pipe body is installed and having a water inlet and a water outlet so that the water is introduced and discharged, and the pipe body is separated from the inner side wall of the housing by a predetermined distance by an interval maintaining member, and lead wires are connected to the housing and the connecting members to potentialize the negative electricity.

[3] The water disposal plant according to claim 1, wherein the cathode generating bodies are made of a mixture of zinc, copper, and silver and are formed so as to have a small regular or irregular granule shape, and the high negative electricity generating body is made of magnesium and has a bar shape of a predetermined length.

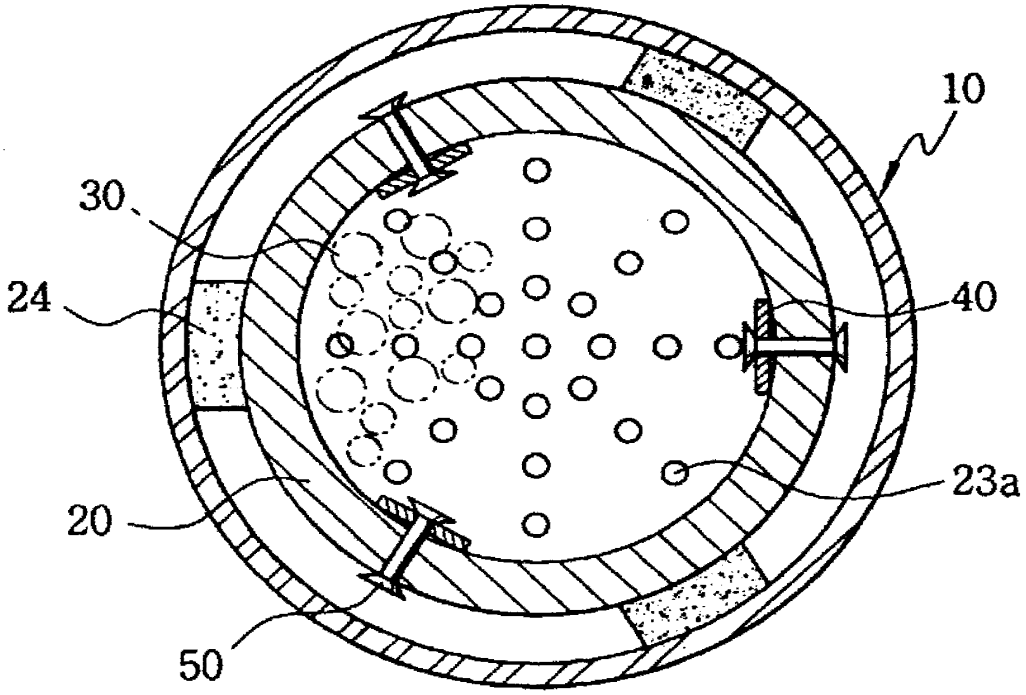
[4] The water disposal plant according to claim 1, wherein the front surface of the induction body has a cone shape to disperse and induce the water, and an interval regulating member of a screw engagement type is provided on the rear surface of the induction body to regulate the interval between the induction body and the pipe body and thus to regulate the flow rate of the water.

[5] The water disposal plant according to claim 1, wherein the pipe body is installed in a fuel tank of a vehicle or a boiler, and the water on the bottom of the tank is deoxidated by the specific gravity to increase the amount of hydrogen.

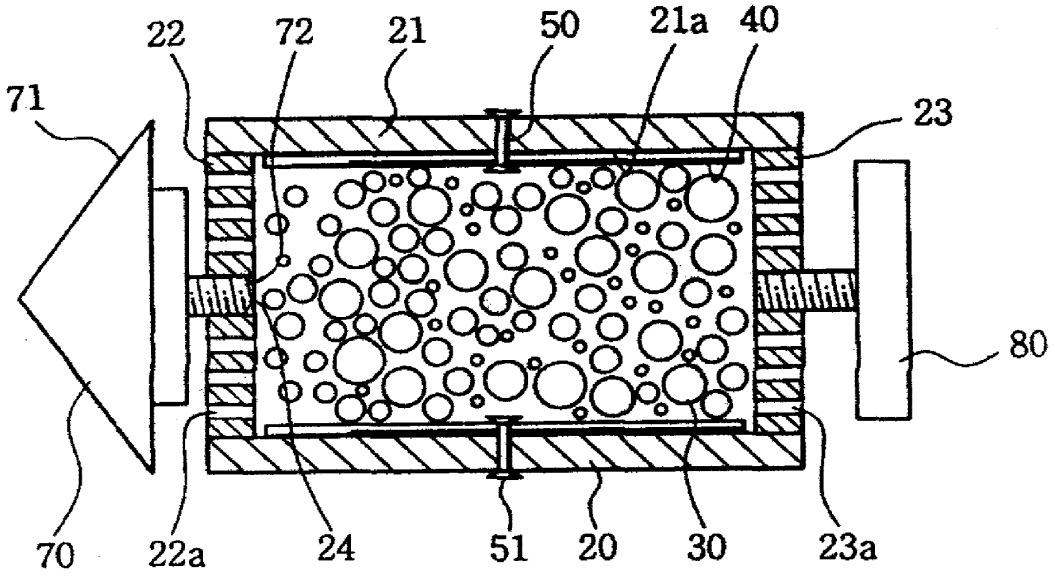
[Fig. 1]


71
22
72
21
50
21a
40
10
1
23
11
12
70
24
22a
60
51
20
30
23a
13

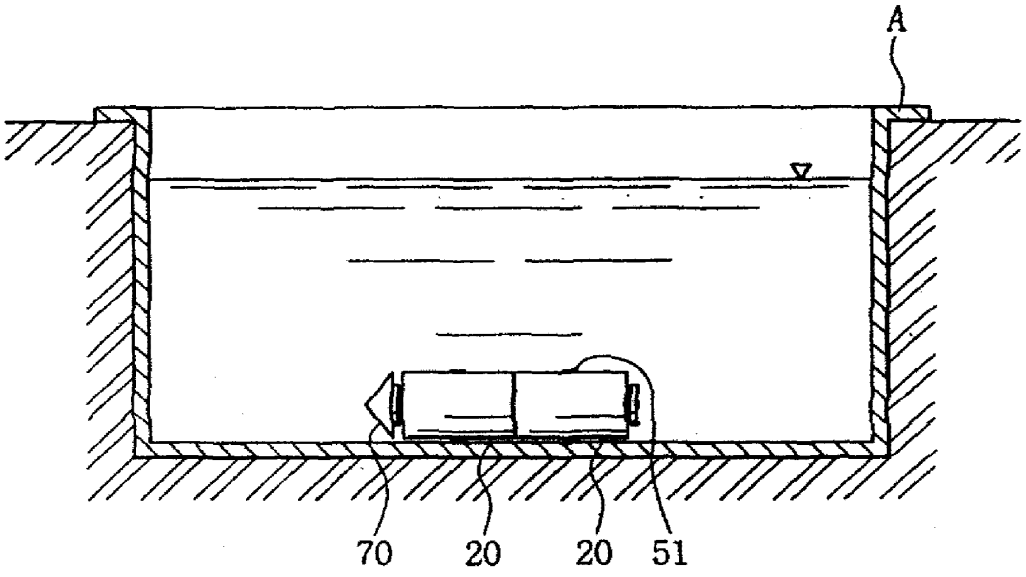
[Fig. 2]


10
30
24
40
23a
20
50

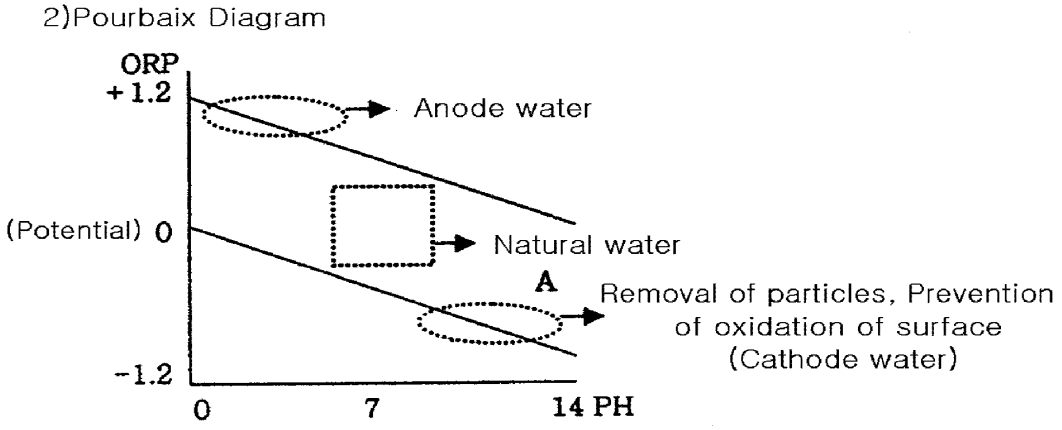
[Fig. 3]



[Fig. 4]



[Fig. 5]


2)Pourbaix Diagram
ORP
+1.2
(Potential) 0
-1.2
0
7
14 PH
Anode water
Natural water
A
Removal of particles, Prevention
of oxidation of surface
(Cathode water)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2004/003407

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 C02F 1/46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B01D, C02F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Patents and applications for invention since 1975
Korean Utility models and applications for Utility models since 1975
Japanese Utility models and application for Utility models since 1975

Electronic data base consulted during the intertnational search (name of data base and, where practicable, search terms used)
eKIPASS, Delphion, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2003-334560 A (Japanorgano Co. Ltd.) 25 November 2003 see the whole document	1-5
A	JP 9-57273 A (Taizan KK) 4 March 1997 see the whole document	1-5
A	JP 2003-225667 A (Daikin Ind. Ltd.) 12 August 2003 see the whole document	1-5
A	JP 9-225473 A (Yasuda Mitsuaki) 2 September 1997 see the whole document	1-5
A	US 4865747 (Aqua-D Corp.) 12 September 1989 see the whole document	1-5
A	US 5788857 A (Nalco Chemical Company) 4 August 1998 see the whole document	1-5
P, A	KR 2004-79264 A (Seung Gwang Co. Ltd.) 14 September 2004 see the whole document	1-5

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
30 MARCH 2005 (30.03.2005)	**31 MARCH 2005 (31.03.2005)**

Name and mailing address of the ISA/KR	Authorized officer
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Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR2004/003407

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2003-334560 A	25-11-2003	US 20030213695 A1 EP 1364709 A3	20-11-2003 14-01-2004
JP 9-57273 A	04-03-1997	NONE	
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KR 2004-79264 A	14-09-2004	NONE	

Sending number : 9-5-2011-020733698
Dispatched date : 2011.04.18
Submission due date : 2011.06.18

YOUR INVENTION PARTNER

KIPO

Notification of Reason for Refusal

Applicant.	Name.	Sang-Jin Lee(applicant code: 419980351859)
	Address.	Secure Information
Agent.	Name.	
	Address.	
Inventor.	Name.	Sang-Jin Lee
	Address.	Secure Information
Application No.		10-2008-0038583
Title of Invention		cooling system

1. Because of having the reason for refusal like the examination result next about this application and notifying of this according to the article 63 of Patent Act in case it has the opinion or the correction is needed it wants to the submission due date opinion (the reply, and the Written Reply) to submit the Amendment [form of attached document No.9 of Enforcement Regulation of Patent Act].

2. The request for an extension of designated period can be applied about the submission due date by unit of the January to 4 month and if necessary, 2 month or greater is summed up in 4 month range and it can request the extension. The Written Substantiation describing the proprietary is additionally attached in the time for to postponing the designated period to the generation (the guideline reference of the lower part) of the inevitable proprietary in excess of 4 month and the Request for Extension of Designated Period has to be submitted.

[Examination result]

☐Subject of examination claim:

Claim 1-8.

☐ The law articles in connection with the part in which it has the reason for refusal of this application.

[The detailed reason for refusal]

1. The application cannot be granted for a patent since it cannot satisfy the requisite according to the article 42(3) of Patent Act due to deficiency in the description of the detailed description of the invention as pointed out below.

- Follows -

Because the element means "both sides energy generation factor" written in the detailed description of the invention is not clear and the operation relation is not clear and it is clear so that a person skilled in the art easily performs in the technical field in which this invention belongs and the specifically the detailed description of the invention is not written whether it makes and it accelerates with the molecule activity between the atom.

2. The application cannot be granted for a patent since it cannot satisfy the requisite according to the article 42(4)(2) of Patent Act due to deficiency in the description of claim 3 of the patent claim, and claim 5 to claim 8 as pointed out below.

- Follows -

a. The statement content of claim is vague like the next.

1) Claim 3.

The operation relation with the element it is not clear and dissimilar because as to 'both sides energy generation factor', the element means is vague.

2) Claim 5.

In 'the housing of the porosity comprised of the hollow tube shape in which both ends is opened', it is vague where "porosity" is formed at the housing.

3) Claim 6.

The paper in which "unevenness" is formed in the hollow tube inside where is vague.

4) Claim 7 and claim 8.

'in the crosswise of the thermal medium flow' indicates the where it is vague.

Therefore, the invention in which claim 3 , and claim 5-8 try to be protected is vague.

3. Patent cannot be received according to the article 29(2) of Patent Act since claim 1 of the patent claim of this application, claim 2 , and the invention in claim 4 are the person having ordinary skill in the art to which the invention pertains easily invents like the lower part before the application.

- Follows -

Cited invention 1:1999-0057253 A(1999.07.15)

Cited invention 2:10-2005-0064534 A(2005.06.29)

1) Claim 1 related.

Claim 1 can be contrasted with the cited invention 1 like the lower part table.

Claim 1.		Cited invention 1.	The configuration 1 it is vacant.
	Water tub.	The lower part water jacket (7) and upper portion water jacket (6)	Essentially identity.
Configuration 2.	Radiator.	Radiator (1)	Identity.
Configuration 3.	Pump.	Pump (3)	Identity.
Configuration 4.	Cooling fan.	The fan equipped between the radiator	Identity.

		and combustion chamber.	
Configuration 5.	The cathode generating body positioned in the heat medium oil.	None.	Difference.

If it looks into about the difference of the configuration 5 , the difference having the cathode generating body built-in as to claim 1, is in the fluid path to the cited invention 1. But with the configuration of the cited invention 1 is changed a design to the purpose using the technical feature including the water-treatment apparatus (1) on the conduit line there is no technical difficulty according to the same and since it is within the range that is moreover predictable with functional effect this corresponds the anti-corrosion etc. to the simple design change in the cited invention 2 about the water-treatment apparatus.

Therefore, claim 1 can be invented by the normal technical engineer based on the cited invention 1 and cited invention 2.

2) Claim 2 related.

The matter limited in claim 2 is substantially the same in the cited invention 2 includes the lead line (60) in the water-treatment apparatus (1).

Therefore, claim 2 can be invented by the normal technical engineer based on the cited invention 1 and cited invention 2.

3) Claim 4 related.

Claim 4 limits the position in which the cathode generating body is equipped and the normal technical engineer as to the this, is only the simple design change item which it appropriately chooses in the process of applying the water-treatment apparatus (1) of the cited invention 2 to the cited invention 1.

Therefore, claim 4 can be invented by the normal technical engineer based on the cited invention 1 and cited invention 2.

The list of reference in submission of the Amendment.

It wants to refer to this since it was difficult due to the deficiency in the description to specify the invention and claim 3 , and claim 5-8 did not determine patent available requisite (the novelty and inventive step).

[Appendix]

The appendix 1 10-1999-0057253 A (1999.07. 15.) one copy.

The appendix 2 10-2005-0064534 A (2005.06. 29.) one copy.

Appendix 3 standard specification one copy.

Appendix 4 standard specification making method one copy. end.

2011.04.18

KIPO Machinery Metals and Construction Examination Bureau.

Turbine group examination part.
Examiner. Gil-Nam Kim
Examiner. On-Gi Baek

Espacenet

Bibliographic data: JPH10246595 (A) — 1998-09-14

OIL COOLER FOR VEHICLE

Inventor(s): ICHIHARA TAKAYUKI ± (ICHIHARA TAKAYUKI)

Applicant(s): TENNEX KK ± (TENNEX:KK)

Classification: **- international:** ***F01P11/06; F01P11/08; F28D1/06; F28D9/00; F28F19/00; F28F19/06; F28F3/08;*** (IPC1-7): F01P11/06; F01P11/08; F28D1/06; F28F19/00; F28F3/08

- cooperative: **F28D9/0043**; **F28F19/06**; F28D2021/0089; F28F2250/104

Application number: JP19970067417 19970305

Priority number(s): JP19970067417 19970305

Abstract of JPH10246595 (A)

PROBLEM TO BE SOLVED: To prevent lowering of strength or oil leakage by preventing corrosion even when a thin aluminum plate is employed for an element of an oil cooler. SOLUTION: An element 12 comprising unit members of first and second thin aluminum plates 12a, 12b sandwiching a fin plate 12c stacked in multistage is contained on the inside of a thick case aluminum cover 11 having a cooling water take-in port 11b on one side and oil inlet 11c and outlet 11d on the opposite sides of upper wall. The elements 11 are coupled to the upper wall of the cover 11 and a window 11e of specified area is made in the center of the upper wall. A sacrifice anode body 20 of magnesium alloy, or the like, is fixed replaceably to the part of the window 11e and applied with an aluminum cover 19 and the a partitioner 13 is fixed to the underside of the cover 11 thus obtaining an oil cooler Oe. The oil cooler Oe is secured to a cast iron engine block Eb at a plurality of positions of the lower flange part thereof.

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CLAIMS JPH10246595

1. Inside a cover having a thick aluminum casting, having an inlet for cooling water at one side wall and having inlets and outlets for oil at both side portions of the upper wall, and having a flange portion around the open end portion, thin aluminum , An element in which unit members having fin plates interposed between a pair of upper and lower opposing plates are stacked in multiple stages is accommodated and the element is caused to flow into each unit member from the inlet of the cover and let out from the outlet In an oil cooler to be connected to an upper wall of the cover and to be assembled to an engine block made of cast iron at a plurality of places of the flange portion, a window hole having a predetermined width is provided in an upper wall or a side wall of the cover, Sacrificial anode body made of a metal with a lower corrosion potential was removably attached via an aluminum lid plate replaceably attached Oil cooler for the vehicle to be.

2. 2. The oil cooler for a vehicle according to claim 1, wherein a water detection sensor is embedded in the sacrificial anode body and connected to a notifying member on the vehicle body so that a predetermined wear of the anode body can be detected .

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DESCRIPTION JPH10246595

[0001] BACKGROUND OF THE INVENTION 1. Field of the Invention The present invention relates to an oil cooler which is useful not only to reduce the weight of a vehicle but also to prevent corrosion.

[0002] In a diesel engine mounted on a bus, a truck, a construction vehicle and the like, an oil cooler Oc is mounted on the side surface of the engine block Eb as shown in FIG. 4, and this oil cooler Oc faces the water jack around the cylinder, circulating by the pump P from the radiator R So as to take in the cooling water to be brought into contact with the sliding portion of the engine and the oil to be lubricated fed to the bearing portion so as to face the flow so that the temperature of the oil is maintained at a predetermined level.

[0003] As shown in FIG. 5, the oil cooler Oc is composed of a hat-shaped cover 1 whose lower side is opened and an element 2 accommodated therein. The cover 1 is made of an aluminum casting having a wall thickness of about 5 to 10 mm Die cast), has a flat rectangular or elliptical shape, has a flange portion 1a around the open end portion, a cooling water intake port 1b is provided on one side wall, and an oil inlet 1c is provided on the upper wall with cooling water On the opposite side of the intake 1b and the outlet 1d on the same side.

[0004] On the other hand, the element 2 is a multi-plate type made of a stainless steel plate having a wall thickness of about 0.3 mm to 0.4 mm and has a planar shape the same as that of the cover 1, and has a downward dish-like first plate 2 a and an upward dish-like second A plate 2b and a fin-shaped plate 2c having a corrugated shape arranged between the two plates. The first plate 2a has an upward pipe portion 2a1 aligned with the oil inlet 1c or the outlet 1d of the cover 1 at both side portions in the longitudinal direction On the other hand, the second plate 2b has a downward pipe portion 2b1 on both sides in the longitudinal direction except for the lowermost stage of the second plate 2b And has a collar 2 b 2 in its periphery and a number of protrusions 2 b 3 on its lower surface.

[0005] The first plate 2 a and the second plate 2 b face each other while interposing the fin plate 2 c therebetween to form a unit member for heat exchange, and the downward pipe portion 2 b 1 of the second plate 2 b of the upper stage member is provided with The upward pipe portion 2a1 of the first plate 2a of the unit member is fitted in and the spacer ring 4 made of stainless steel is fitted on the outside of the unit so as to be stacked in plural stages and placed in the upward pipe portion 2a1 of the uppermost first plate 2a Is fitted with a flange 5 for cover coupling which is made of stainless steel and has a planar rhombic shape and reinforcing plates 6 are attached to the lower surfaces of both side portions of the lowermost second plate 2b and the whole is brazed It is an element 2.

[0006] Such an element 2 is accommodated in the cover 1, and a sealing gasket 8 is interposed on flanges 5 on both sides, and the element 2 is assembled to the upper wall of the cover 1 with a plurality of galvanized iron bolts 7 etc., and the cover 1, a partition plate 3 made of a stainless steel plate for cooling water guide is screwed to the oil cooler Oc, and this oil cooler Oc is fixed to the gasket 8 at a plurality of places around the cover open end of the flange portion 1a , And is attached to the engine block Eb by a bolt 7 with the washer 7a interposed.

[0007] The oil sucked up from the oil pan flows into each unit member of the element 2 from the inlet 1 c of the cover 1 while the cooling water on the radiator side is introduced from the intake port 1 b on the opposite side, Heat exchanges with the oil by flowing through the gap and the surroundings, and the cooled oil is sent from the outlet 1 d to the sliding portion and the bearing portion of the engine, and the cooling water flows from the outlet 3 a provided in the partition plate 3 to the cylinder It flows to the circumference.

[0008] Recently, in the trucks and construction vehicles, in order to reduce the weight and cost of the vehicle in relation to the problem of overloading, to make the oil cooler for the diesel engine mounted be made of aluminum However, in the case where the entire oil cooler is made of aluminum, in an environment where cooling water at a high temperature (about 80 ° C.) is present, bolts are supplied to an engine block made of cast iron, the aluminum oil cooler being a different metal And the problem of electrochemical corrosion, so-called galvanic corrosion, must be taken into consideration. Even if the cover is made of aluminum, an oxide film is formed on the surface during casting, it is hard to corrode, and the wall thickness Therefore, even if corrosion occurs, the influence is small, whereas corrosion occurs concentrating on the element consisting of a plate material (cold rolling) of 1 mm or less Stainless steel plate is used exclusively for elements because there is a risk of lowering the strength and oil leakage.

[0009] In view of the above, an object of the present invention is to provide a vehicle that can be lightweight without causing corrosion and causing no deterioration in strength and oil leak even if aluminum is used as an element of the oil cooler in an environment where cooling water is present To make it an issue.

[0010] SUMMARY OF THE INVENTION In view of the above-mentioned problems, the present invention provides an aluminum casting which is made of a thick aluminum casting, has an inlet for cooling water at one side wall and oil inlet and outlet at both side portions of the upper wall , An element made of thin aluminum and made of thin aluminum and having a fin plate interposed between a pair of upper and lower plates facing each other is stacked in multiple stages inside a cover having a flange portion around the open end portion, An oil cooler connected to an upper wall of the cover so as to allow oil to flow in from the entrance of the cover into the cover and flow out therefrom and to be assembled to an engine block made of cast iron at a plurality of places on the flange portion, A window hole of a predetermined width is provided in the side wall, and a sacrificial anode body made of a metal having a corrosion potential lower than that of aluminum is exchangeably taken in the window hole portion And a water detection sensor was embedded in the sacrificial anode body and connected to a notifying member on the vehicle body so as to be able to detect a predetermined consumption of the anode body .

[0011] DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS FIG. 1 shows an example of an oil cooler Oc according to the present invention, in which the cover 11 is made of an aluminum casting (die casting) having a thickness of about 5 to 10 mm and has a flat rectangular or elliptical cap shape And a flange portion 11a is provided around the open end portion, a cooling water intake port 11b is provided on one side wall, and an oil inlet 11c is provided on the upper wall on the side opposite to the cooling water inlet port 11b And an outlet 11 d are provided on the same side.

[0012] On the other hand, the element 12 accommodated inside the cover is a multi-plate type made of a cold-rolled aluminum plate having a wall thickness of about 0.6 mm to 1 mm, the planar shape thereof is the same as that of the cover 11, a downward dish shape Shaped first plate 12a and an upwardly dish shaped second plate 12b and a porous corrugated fin plate 12c disposed between the first plate 12a and the second plate 12b. The first plate 12a has oil inlets 11c Or an upward pipe portion 12a1 which is aligned with the outlet 11d and has a collar 12a2 in its periphery and the other plate has a projecting portion 12a3 for space maintenance on the upper surface and the other portion of the second plate 12b Except that a downward pipe portion 12b1 coinciding with the inlet and outlet of oil is provided on both side portions in the longitudinal direction and a flange 12b2 is provided in the periphery and numerous Have a child 12b3.

[0013] The first plate 12a and the second plate 12b face each other while interposing the fin plate 12c therebetween to form a unit member for heat exchange, and the downward pipe portion 12b1 of the second plate 12b of the upper stage member is provided with The upward pipe portion 12 a 1 of the first plate 12 a of the unit member is fitted in and the spacer rings 14 made of aluminum cast are fitted on the outside and stacked in plural stages. In the upward pipe portion 12 a 1 of the uppermost first plate 12 a, Similarly, a rhomboid cover coupling flange 15 made of aluminum casting is fitted and reinforcing plates 16 of the same material are attached to both side portions of the bottom surface of the lowermost second plate 12b, and the whole is brazed An element 12 is formed.

[0014] The element 12 as described above is disposed on the flange 15 on both sides with a gasket 18 for non-metallic sealing and housed in the cover 11, and the washer 17 a is interposed with an ordinary steel bolt 17 plated with zinc to cover the cover 11 To the upper wall.

[0015] A window hole 11 e having a predetermined area such as a rectangular or elliptical shape or a circular shape is formed in the central portion of the upper wall of the cover 11, and in the portion of the window hole 11 e, a corrosion potential Sacrificial anode body 20 of a predetermined size (for example, a rectangular parallelepiped having a length of 100 mm to 150 mm, a width of 50 mm to 60 mm, a wall thickness of about 20 mm to 30 mm) made of a base alloy (low) of a zinc alloy or magnesium alloy The cover 19 is detachably fixed to the lid plate 19 made of aluminum cast by the setscrew 20a and the lid 19 is detachably fixed to the gasket 18 by the usual set screw 19a. Further, the open end of the cover 11 An aluminum partition plate 13 having an outlet 13a is attached by screws of the same material to form one oil cooler Oc There.

[0016] The oil cooler Oc thus formed is disposed at a predetermined position of the engine block Eb by applying a gasket 18 to the lower surface of the flange portion 11a in the vicinity of the open end portion and a plurality of bolts 17 .

[0017] At the time of use, the oil sucked up from the oil pan flows into each unit member of the element 12 from the inlet 11 c of the cover 11, while the cooling water on the radiator side is introduced into the cover 11 from the intake port 11 b on the opposite side, Heat exchanges with the oil by flowing through the gaps and surroundings between the unit members, and the cooled oil is sent from the outlet 11 d to the sliding portion and the bearing portion of the engine, and the cooling water flows through the outlet port 13 a of the partition plate 13 To the water jacket of the engine peripheral surface.

[0018] At that time, inside the oil cooler Oc, the sacrificial anode body 20 made of a metal lower than aluminum relative to the element 12 is disposed in the presence of cooling water, so that corrosion current flows from the anode body 20 It flows through the cooling water to the element 20 side and returns from the element 20 to the anode body 20 through the cover 11 so that the anode body 20 is gradually consumed and corrosion of the element 20 is reliably prevented. Then, when a predetermined period (for example, 1 to 3 years) has elapsed according to the material, size, and the like of the sacrificial anode body 20, the anode body 20 is removed from the cover 11 and replaced with a new one.

[0019] In this case, as shown in FIG. 2, a water detection sensor 21 in which an electrode 22 is enclosed in an insulating material such as nylon is buried in the sacrificial anode body 20 through the cover plate 19, and the amplifier 23 is connected to a monitor lamp 24, and when the anode body 20 is exhausted and becomes thin and the tip of the electrode 22 comes into contact with the cooling water, if the monitor lamp 24 is turned on, the replacement timing of the sacrificial anode body 20 is automatically known It is convenient.

[0020] The sacrificial anode body 20 is provided not only with the upper wall of the cover 11 but also with a window hole 11e of a predetermined size on the side wall in the longitudinal direction (perpendicular to the sheet of paper) as shown in FIG. 3, and is attachable / detachable to this part through the cover plate 19 , And it is more effective to use a magnesium-based alloy having a lower corrosion potential for the sacrificial anode body 20.

[0021] As described above, since the element 12 is positively corroded by the sacrificial anode body 20, the partition plate 13 provided at the open end portion of the cover 11 is not made of aluminum, and as long as it does not affect the weight of the oil cooler Oc, stainless steel It may be made of a steel plate or a coated iron plate. However, although the partition plate 13 guides the cooling water to flow intensively in the cover 11, it is not necessary to provide it. In addition, a buzzer may be used as a notifying member instead of the monitor lamp.

[0022] As described above, according to the present invention, a multi-plate type element made of a thin aluminum plate is housed inside a cover made of a thick aluminum casting, the element is joined at a plurality of places on the cover upper wall and the cover As an oil cooler for a vehicle to be assembled to a cast iron engine block at a plurality of places in the flange portion around the open end portion, a window hole having a predetermined width is provided in the upper wall or the side wall of the cover, and in this window hole portion , A sacrificial anode body made of a metal having a corrosion potential lower than that of aluminum is detachably attached via an aluminum cover plate that is replaceably attached to the element. Therefore, in an environment where cooling water is present, aluminum , It is possible to reliably prevent the corrosion, which contributes to reduction in weight of the vehicle without causing strength reduction and oil leakage And than, and, buried water detection sensor in the sacrificial anode material, which if connected to a notification member provided on the vehicle body, can be known automatically ensure the replacement timing of the sacrificial anode body.

[0023] Brief Description of the Drawings

[0024] FIG. 1 is a partial cross-sectional view of an example of an oil cooler according to the present invention.

[0025] Fig. 2 A cross-sectional view of which part of the example in which the water detection sensor is mounted is omitted.

[0026] FIG. 3 is a cross-sectional view of an example in which a sacrificial anode body is provided on a side wall.

[0027] FIG. 4 is a perspective view showing the use state of the oil cooler.

[0028] FIG. 5 is a partial sectional view of a conventional oil cooler.

[0029] Explanation of sign

[0030] 11 cover 11 a flange 11 b intake 11 c inlet 11 d outlet 11 e window hole 12 element 12 a first plate 12 b second plate 12 c fin plate 13 partition plate 15 flange 19 cover plate 20 sacrificial anode body 21 water detection sensor

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Ｆ２８Ｄ	1/06		Ｆ２８Ｄ	1/06	Ａ
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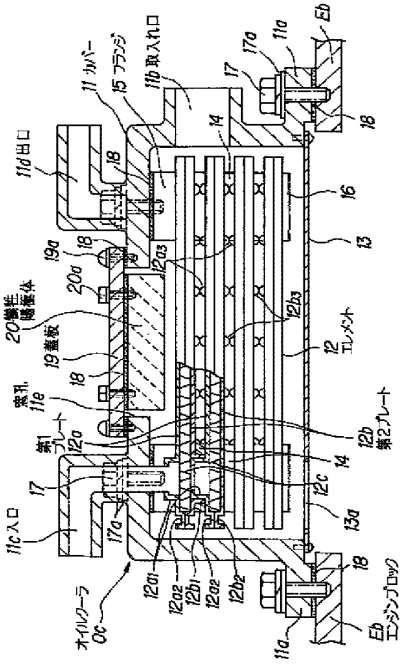
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(54)【発明の名称】　車両用のオイルクーラ

(57)【要約】　（修正有）

【課題】　オイルクーラのエレメントに肉薄なアルミニウム製のプレートを用いたにしても、腐食を生ぜず、強度低下やオイル洩れを招かないようにする。

【解決手段】　肉厚なアルミニウム鋳物製で、一側部に冷却水の取入れ口１１ｂを有し上壁の両側にオイルの入口１１ｃと出口１１ｄを持ち、下側周辺にフランジ部１１ａを備えるカバー１１の内側に、肉薄なアルミニウムの第１プレート１２ａと第２プレート１２ｂとの間にフィンプレート１２ｃを介在させた単位部材を多段に積層したエレメント１２を収容し、エレメント１２をカバー１１の上壁に結合し上壁の中央部には所定広さの窓孔１１ｅを設け、この窓孔１１ｅの部分に、マグネシウム合金等の犠牲陽極体２０を交換自在に取付けアルミニウムの蓋体１９を装着し、カバー１１の下側には仕切板１３を施してオイルクーラＯｃとなし、その下側フランジ部の複数箇所において鋳鉄製のエンジンブロックＥｂに組付ける。



【特許請求の範囲】
【請求項１】　肉厚なアルミニウム鋳物からなり、一側壁に冷却水の取入れ口を有すると共に上壁の両側部にオイルの入口と出口を備え、開放端部周辺にフランジ部を有するカバーの内側に、肉薄なアルミニウムからなり、向き合う上下一対のプレートの間にフィンプレートを介在させた単位部材を多段に積層したエレメントを収容し、該エレメントを、各単位部材中にカバーの入口からオイルを流入させ出口から流出させるようにカバー上壁に結合すると共にフランジ部の複数箇所において鋳鉄製のエンジンブロックに組付けるオイルクーラにおいて、カバーの上壁又は側壁に所定広さの窓孔を設け、その窓孔の部分にアルミニウムより腐食電位の卑な金属からなる犠牲陽極体を交換自在に取付けたアルミニウムの蓋板を介し着脱自在に装着したことを特徴とする車両用のオイルクーラ。
【請求項２】　上記犠牲陽極体に水検知センサを埋設し、これを車体上の報知部材に接続し、陽極体の所定の消耗を検知できるようにしたことを特徴とする請求項１記載の車両用のオイルクーラ。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】この発明は車両の軽量化に役立つと共に腐食を招かないようにしたオイルクーラに関する。
【０００２】バス、トラック及び建設車両等に搭載されるディーゼルエンジンでは図４のようにエンジンブロックＥｂの側面にオイルクーラＯｃを装着し、これをシリンダ回りのウォータジャットに臨ませ、ラジエータＲからポンプＰにより循環させられる冷却水を取入れると共にその流れに対向するようにエンジンの摺動部分や軸受部分に送られる潤滑用のオイルを取入れて熱交換させ、オイルの温度を所定に保つようにしている。
【０００３】そのオイルクーラＯｃを示せば図５のとおりであり、下側が開放された帽子状のカバー１と内部に収容されるエレメント２とからなり、カバー１は肉厚が５～１０ｍｍ程度のアルミニウム鋳物（ダイカスト）製で、平面長方形又は楕円形をなし、開放端部周辺にフランジ部１ａを備え、一側壁には冷却水の取入れ口１ｂが設けられ、上壁にはオイルの入口１ｃが冷却水の取入れ口１ｂの反対側にあり、出口１ｄが同じ側にあるように設けられている。
【０００４】一方、エレメント２は肉厚０．３ｍｍないし０．４ｍｍ程度のステンレス鋼板からなる多板式のもので、平面形状をカバー１と同じくし、下向き皿状の第１プレート２ａと上向き皿状の第２プレート２ｂ及び両者の間に配設される多孔波形のフィンプレート２ｃからなり、第１プレート２ａは長手方向の両側部にカバー１のオイル入口１ｃ又は出口１ｄに整列する上向きパイプ部$２ａ_{1}$を備えると共に周辺につば$２ａ_{2}$を持ち、最上段以外のものは上面に多数のスペース維持用の突子$２ａ_{3}$を有し、又第２プレート２ｂは最下段のものを除いて長手方向両側部に下向きパイプ部$２ｂ_{1}$を備えると共に周辺につば$２ｂ_{2}$を持ち、かつ下面には多数の突子$２ｂ_{3}$を有している。
【０００５】そして、内側にフィンプレート２ｃを介在させながら第１プレート２ａと第２プレート２ｂを向い合せて熱交換用の単位部材となし、上段の単位部材の第２プレート２ｂの下向きパイプ部$２ｂ_{1}$に下段の単位部材の第１プレート２ａの上向きパイプ部$２ａ_{1}$を嵌挿し、かつその外側にステンレス鋼製のスペーサリング４を嵌め合せつつ複数段積層し、最上段の第１プレート２ａの上向きパイプ部$２ａ_{1}$には同じくステンレス鋼製で平面菱形状のカバー結合用のフランジ５を嵌合し、最下段の第２プレート２ｂの両側部下面に補強用のプレート６を添設し、それら全体がろう付けされてエレメント２をなしている。
【０００６】このようなエレメント２がカバー１内に収容され、両側のフランジ５上にシール用のガスケット８を介在させてカバー１の上壁に複数の亜鉛メッキした鉄製のボルト７等により組付けられ、カバー１の開放端部には冷却水ガイド用のステンレス鋼板製の仕切板３がビス止めされてオイルクーラＯｃをなし、このオイルクーラＯｃはカバー開放端部周辺のフランジ部１ａの複数箇所においてガスケット８，座金７ａ介在のもとにボルト７によりエンジンブロックＥｂに取付けられている。
【０００７】その使用時にはオイルパンから吸い上げられたオイルがカバー１の入口１ｃからエレメント２の各単位部材中に流入する一方、ラジエータ側の冷却水が反対側の取入れ口１ｂから導入され、各単位部材同士の間隙および周囲を流れてオイルとの熱交換が行われ、冷却されたオイルは出口１ｄからエンジンの摺動部や軸受部に送られ、冷却水は仕切板３に設けられた流出口３ａからシリンダ周面に流れていく。
【０００８】
【発明が解決しようとする課題】　最近、トラックや建設車両では過積載の問題に関連して車両の軽量化やコスト低減のため、搭載されているディーゼルエンジン用のオイルクーラをアルミニウム製とすることが望まれているが、オイルクーラ全体をアルミニウムとした場合、高温（８０℃程度）な冷却水が存在する環境で、アルミニウム製のオイルクーラが異なる金属である鋳鉄製のエンジンブロックにボルトを介し接触することになり、電気化学的な腐食いわゆるガルバニ腐食の問題を考慮しなければならず、そして、カバーはアルミニウムとしても鋳造時に表面に酸化皮膜ができて、腐食しにくく、しかも肉厚なため腐食が生じても影響は小さいのに対し、１ｍｍ以下のプレート材（冷間圧延）からなるエレメントに集中して腐食が生じ、強度低下やオイル洩れを起こす恐れがあることからエレメントには専らステ

ンレス鋼板が用いられている。
【０００９】そこで、この発明は冷却水が存在する環境で、オイルクーラのエレメントにアルミニウムを用いたにしても、腐食を生ぜず、強度低下やオイル洩れを招くことなく、車両の軽量化に役立つようにすることを課題にする。
【００１０】
【課題を解決するための手段】上記課題のもとにこの発明は、肉厚なアルミニウム鋳物からなり、一側壁に冷却水の取入れ口を有すると共に上壁の両側部にオイル入口と出口を備え、開放端部周辺にフランジ部を有するカバーの内側に、肉薄なアルミニウムからなり、向き合う上下一対のプレートの間にフィンプレートを介在させた単位部材を多段に積層したエレメントを収容し、該エレメントを、各単位部材中にカバーの入口からオイルを流入させ出口から流出させるようにカバー上壁に結合すると共にフランジ部の複数箇所において鋳鉄製のエンジンブロックに組付けるオイルクーラにおいて、カバーの上壁又は側壁に所定広さの窓孔を設け、その窓孔の部分に、アルミニウムより腐食電位の卑な金属からなる犠牲陽極体を交換自在に取付けたアルミニウムの蓋板を介し着脱自在に装着したこと、並びに上記犠牲陽極体に水検知センサを埋設し、これを車体上の報知部材に接続し、陽極体の所定の消耗を検知できるようにしたことを特徴としている。
【００１１】
【実施の形態】図１はこの発明に係るオイルクーラＯｃの一例を示すものであり、カバー１１は肉厚が５～１０ｍｍ程度のアルミニウム鋳物（ダイカスト）製で、平面長方形又は楕円形の帽子状をなし、開放端部周辺にフランジ部１１ａを備え、一側壁には冷却水の取入れ口１１ｂが設けられ、上壁にはオイルの入口１１ｃが冷却水の取入れ口１１ｂとは反対側に設けられると共に出口１１ｄが同じ側に設けられている。
【００１２】一方、カバーの内側に収容されるエレメント１２は肉厚が０．６ｍｍないし１ｍｍ程度の冷間圧延されたアルミニウム板からなる多板式のもので、平面形状はカバー１１と同じであり、下向き皿状の第１プレート１２ａと上向き皿状の第２プレート１２ｂ及び両者の間に配設される多孔波形のフィンプレート１２ｃからなり、第１プレート１２ａは長手方向の両側部にカバー１１のオイルの入口１１ｃ又は出口１１ｄに整列する上向きパイプ部$12a_1$を備えると共に周辺につば$12a_2$を持ち、かつ最上段以外のものは上面にスペース維持用の突子$12a_3$を有し、又第２プレート１２ｂは最下段のものを除いて長手方向両側部にオイルの入出口に一致する下向きパイプ部$12b_1$を備えると共に周辺につば$12b_2$を持ち、かつ下面には多数の突子$12b_3$を有している。
【００１３】そして、内側にフィンプレート１２ｃを介在させながら第１プレート１２ａと第２プレート１２ｂを向い合せて熱交換用の単位部材となし、上段の単位部材の第２プレート１２ｂの下向きパイプ部$12b_1$に下段の単位部材の第１プレート１２ａの上向きパイプ部$12a_1$を嵌挿し、かつその外側にアルミニウム鋳物製のスペーサリング１４を嵌め合せつつ複数段積層し、最上段の第１プレート１２ａの上向きパイプ部$12a_1$には同じくアルミニウム鋳物製で菱形状のカバー結合用のフランジ１５を嵌合し、最下段の第２プレート１２ｂの下面両側部に同材の補強用のプレート１６を添設し、それら全体がろう付けされてエレメント１２が形成されている。
【００１４】上記のようなエレメント１２が両側のフランジ１５上に非金属製シール用のガスケット１８を配設してカバー１１内に収容され、亜鉛メッキした通常の鉄製ボルト１７により座金１７ａを介在させてカバー１１の上壁に結合される。
【００１５】又、カバー１１の上壁の中央部には平面長方形又は楕円形、円形等の所定広さの窓孔１１ｅが形成され、その窓孔１１ｅの部分には、エレメント１２の上側においてアルミニウムより腐食電位の卑な（低い）亜鉛合金又はマグネシウム合金からなる所定大きさ（例えば直方体のものとして、長さ１００ｍｍないし１５０ｍｍ,幅５０ｍｍないし６０ｍｍ,肉厚２０ｍｍないし３０ｍｍ程度）の犠牲陽極体２０が、通常の止めねじ２０ａによってアルミニウム鋳物製の蓋板１９に交換自在に取付けられて挿入され、蓋体１９がガスケット１８を通常の止めネジ１９ａにより着脱自在に固定され、更にカバー１１の開放端部には流出口１３ａを有するアルミニウム製の仕切板１３が、同材のビスにより取付けられて、一つのオイルクーラＯｃをなしている。
【００１６】このように形成されたオイルクーラＯｃは開放端部周辺のフランジ部１１ａの下面にガスケット１８を施してエンジンブロックＥｂの所定の場所に配設され、複数箇所において座金１７ａ介在のもとにボルト１７により組付けられる。
【００１７】その使用時には、オイルパンから吸い上げられたオイルがカバー１１の入口１１ｃからエレメント１２の各単位部材中に流入する一方、ラジエータ側の冷却水が反対側の取入れ口１１ｂからカバー１１内に導入され、各単位部材同士の間隙及び周囲を流れてオイルとの熱交換が行われ、冷却されたオイルは出口１１ｄからエンジンの摺動部や軸受部に送られ、冷却水は仕切板１３の流出口１３ａからエンジン周面のウォータジャケットに流れていく。
【００１８】その際、オイルクーラＯｃの内側において、冷却水の存在のもとにエレメント１２に相対してアルミニウムより卑な金属からなる犠牲陽極体２０が配設されているので、腐食電流が陽極体２０から冷却水を通ってエレメント２０側に流れ、エレメント２０からカバ

ー１１を通って陽極体２０に戻ることになり、その結果陽極体２０が徐々に消耗してエレメント２０の腐食が確実に防止される。そして、犠牲陽極体２０の材質、大きさ等により予め決められた期間（例えば１～３年）が経過したならば、陽極体２０はカバー１１から外され新しいものと交換される。

【００１９】この場合、図２のように蓋板１９を通じ、ナイロン等の絶縁材に電極２２を封じ込めた水検知センサ２１を犠牲陽極体２０に埋設し、これを増幅器２３を運転室内等に設けたモニタランプ２４に接続し、陽極体２０が消耗して薄くなり電極２２の先端が冷却水に接触したとき、モニタランプ２４を点灯させるようにすれば、犠牲陽極体２０の交換時期が自動的に知れて便利である。

【００２０】犠牲陽極体２０はカバー１１の上壁だけでなく、図３のように長手方向（紙面に垂直）の側壁に所定広さの窓孔１１ｅを設けて、この部分に蓋板１９を介し着脱可能に装着するようにしてもよく、そして、犠牲陽極体２０には腐食電位のより卑なマグネシウム系の合金を用いる方が効果的である。

【００２１】上記のようにエレメント１２は犠牲陽極体２０により積極的に防食されるので、カバー１１の開放端部に設けられる仕切板１３はアルミニウムとすることなく、オイルクーラＯｃの重量に影響しない範囲でステンレス鋼板又は塗装鉄板製のものとしてもよい。しかし、仕切板１３は冷却水をカバー１１内に集中的に流れるようにガイドするものであるが、必ずも設ける必要はない。又、モニタランプに代えてブザーを報知部材としてもよい。

【００２２】

【発明の効果】以上のようにこの発明は肉薄なアルミニウムプレートからなる多板式のエレメントを肉厚なアルミニウム鋳物からなるカバーの内側に収容し、エレメントをカバー上壁の複数箇所において結合すると共にカバー開放端部周辺のフランジ部の複数箇所のおいて鋳鉄製のエンジンブロックに組付ける車両用のオイルクーラとして、カバーの上壁又は側壁に所定広さの窓孔を設け、この窓孔の部分に、アルミニウムより腐食電位の卑な金属からなる犠牲陽極体を交換自在に取付けたアルミニウムの蓋板を介し着脱自在に装着したので、冷却水が存在する環境で、肉薄なプレート材からなるエレメントにアルミニウムを用いたにしても、その腐食を確実に防ぐことができ、強度低下やオイル洩れを招くことなく、車両の軽量化に役立つものであり、そして、犠牲陽極体に水検知センサを埋設し、これを車体上に設けた報知部材に接続しておけば、犠牲陽極体の交換時期を自動的に確実に知ることができる。

【図面の簡単な説明】

【図１】この発明に係るオイルクーラの一例の部分断面図。

【図２】水検知センサを取付けた例の一部を省略した断面図。

【図３】犠牲陽極体を側壁に設けた例の横断面図。

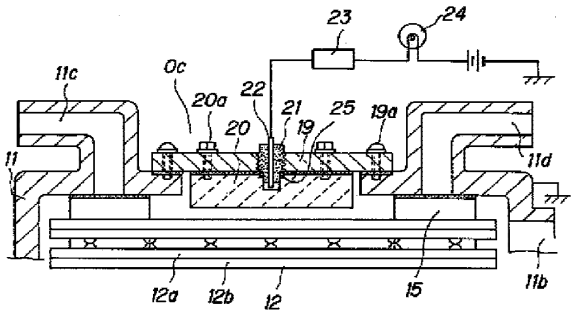
【図４】オイルクーラの使用状態を示す斜視図。

【図５】従来のオイルクーラの部分断面図。

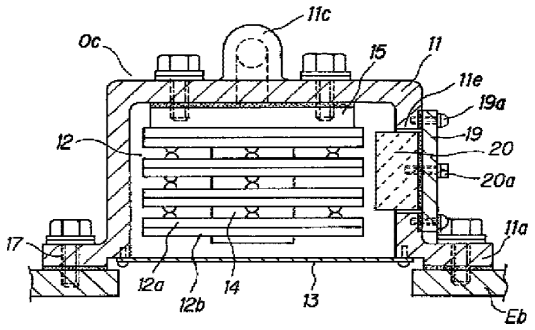
【符号の説明】

１１　カバー
１１ａ　フランジ部
１１ｂ　取入れ口
１１ｃ　入口
１１ｄ　出口
１１ｅ　窓孔
１２　エレメント
１２ａ　第１プレート
１２ｂ　第２プレート
１２ｃ　フィンプレート
１３　仕切板
１５　フランジ
１９　蓋板
２０　犠牲陽極体
２１　水検知センサ

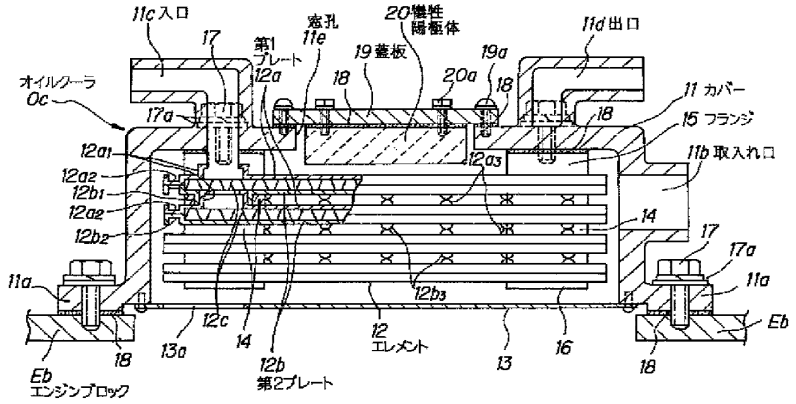
【図２】



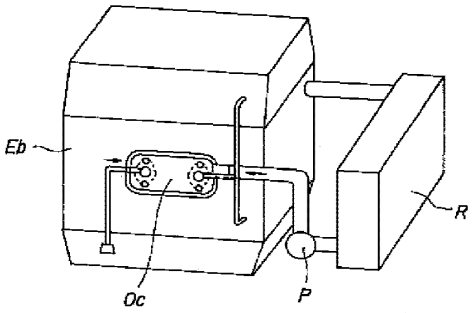
【図３】



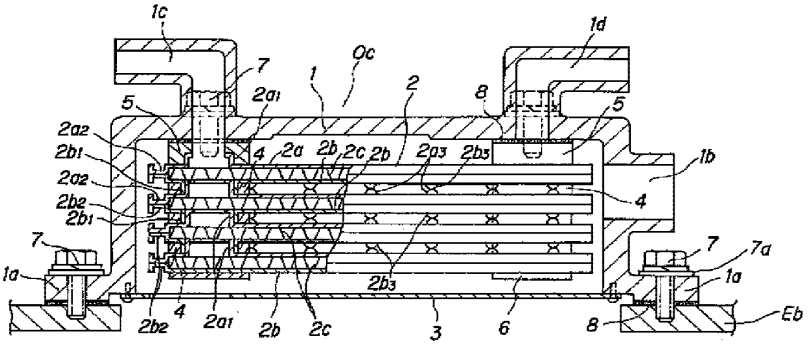
【図１】


11c入口
17
第1プレート
11e
窓孔
20犠牲陽極体
19蓋板
11d出口
19a
20a
18
オイルクーラ
Oc
12a
11 カバー
15 フランジ
17a
12a1
12a2
12b1
12a2
12b2
12a3
11b 取入れ口
14
17
17a
11a
12b3
12c
14
12
エレメント
13a
12b
第2プレート
13
16
Eb
エンジンブロック
Eb

【図４】


Eb
R
Oc
P

【図５】


1c
1d
7
Oc
1
2
8
2a1
5
5
2a2
2b1
4
2a
2b
2c
2b
2a3
2b3
1b
2a2
2b2
2b1
4
7
7
7a
1a
1a
2b3
4
2b2
2a1
2b
2c
3
6
8
Eb

Espacenet

Bibliographic data: CN1225998 (A) — 1999-08-18

Corrosion-proof steel radiator

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Classification: **- international:** ***F28D1/03;*** (IPC1-7): F28D1/03
- cooperative:

Application number: CN1998102419 19980612

Priority number(s): CN1998102419 19980612

Abstract of CN1225998 (A)

The anticorrosive steel-made radiator is characterized by that at least one kind of metal-anode is inserted into the interior of the radiator, at least part of the anode is immersed in the water,a ndbetween the anode and radiator it is metallic contact. Said invention uses the method of sacrificial corrosion to prevent the corrosion of steel-made radiator. It is simple in structure, excellent ininternal anticorrosive performance, and can raise the use effect of steel-made radiator and steel-made connector and prolong their service life.

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CLAIMS CN1225998

1 . A corrosion-resistant steel radiator, which is characterized in that a metal piece with a different material from the radiator is inserted into the steel radiator to form an anode. The potential of the radiator is not less than - | 800 | mV with respect to the body to be protected, and the anode and the radiator There is metal contact between them, and the anode is at least partially immersed in water.

2、The steel radiator according to claim 1, wherein an anode and a radiator are connected to a direct current external power source.

3、Steel radiator according to claim 1 or 2, characterized in that there are other conductors between the anode and the radiator.

4 、 The steel radiator according to claim 1, wherein the material of the anode is selected from the group consisting of magnesium and magnesium alloys, zinc and zinc alloys, and electrode materials such as aluminum and aluminum alloys.

5、The steel radiator according to claim 1 or 2, characterized in that the anode can be made entirely of electrode material as a whole.

6、A steel radiator according to claim 1 or 2, wherein said anode is made of a steel rod as a core and an outer electrode material.

7、The steel radiator according to claim 1, wherein the anode may be one or more rods, sheets or filaments having a circular or rectangular or square cross-section, and the diameter, the thickness or the width thereof is generally not more than 50 mm .

8、The steel radiator according to claim 1, wherein the anode is placed in a heat sink without fixing.

9、The steel radiator according to claim 1, wherein the anode and the radiator are fixed together.

10、The steel radiator according to claim 8, wherein the anode is fixable to the bleed valve.

11 、 The steel radiator according to claim 8, wherein the anode can be fixed on the plug.

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DESCRIPTION CN1225998

Anti-corrosion steel radiator

The present invention relates to a steel radiator capable of preventing corrosion, which is a technical improvement belonging to a heating appliance.

Steel radiator is currently used more of a heating equipment, heating equipment used open tank, the oxygen content of water is generally greater than 0.1mg / liter, it caused the steel radiator and steel parts and joints corrosion , A long time, perforation occurred on the wall, and leaking, some heating area can miss about 80 tons of water a day. Due to internal corrosion, not only affect the use of effects and life expectancy, and the bad parts to be replaced, resulting in varying degrees of economic losses. Moreover, water leakage can damage the furniture, causing other economic losses. Foreign technology is to adopt a closed system, to isolate oxygen, to reduce corrosion, the disadvantage is its large size, difficult maintenance, large investment. Due to the large cost of using foreign technologies, the internal corrosion of steel radiators in China is more serious, affecting the service life and effect of steel radiators.

It is an object of the present invention to provide a steel radiator that incorporates a metal anode and prevents corrosion. The structure of the radiator is simple, the use of sacrificial anode to consume oxygen in the system or absorb oxygen, and make the system gradually alkaline water to achieve the purpose of preservation.

The object of the present invention is achieved by the following technical measures.

Steel in water or aqueous environment, the main corrosion for the electrochemical corrosion. The electrode potential is lower than the iron metal connected to the radiator, forming the original battery, the inserted metal anode slowly dissolved, the radiator steel as a cathode to avoid corrosion, and thus protected, thus forming the anti-corrosion of the present invention Radiator.

In the steel radiator and the radiator inserted into the metal material of different materials constitute the anode, the anode relative to the steel radiator potential of not less than ¦ 800 ¦ mV, between the anode and the radiator must have metal contact, and the anode at least Partially immersed in water, preferably all immersed in water. In order to strengthen the protection effect, the anode and the radiator can also be connected with a DC external power supply. The anodes may be in direct contact with the heat sink to ensure electrical conductivity therebetween, and other conductors may be present between the anode and the heat sink to ensure electrical conductivity therebetween by the connection of other conductors. The material of the anode may be selected from magnesium and magnesium alloys, zinc and zinc alloys, or electrode materials such as aluminum and aluminum alloys. The anode may be made entirely of electrode material as a whole, or may be made of a steel rod as a core and an outer electrode material. The anode may be one or more rods, sheets or filaments having a circular or rectangular or square cross-section and generally not greater than 50 mm in diameter, thickness or width. The anode may be placed unsecured in the heat sink, or the anode and heat sink may be secured together. For example, can be fixed on the deflation valve, or fixed on the plug.

Illustration of the drawing

Figure 1 of the present invention heat sink structure

FIG. 2 is an anode structure diagram of the heat sink used in the present invention

Fig. 3 shows an example of an anode cross-section of a heat sink according to the present invention

The present invention is described in more detail below with reference to a preferred embodiment of the present invention and its accompanying drawings. However, the present invention is not limited in any way by any means within the scope of the embodiments, and any structural change or material without departing from the spirit of the present invention Replacement, should be included in the scope of the present invention. Example

Referring to FIG. 1, which is a structural diagram of a heat sink according to the present invention. The symbols in the figure are radiator body (1), plug (2), anode (3) and bleed valve (4) respectively. It can be seen from the figure that in this embodiment, the anode is soldered inside the radiator with the anode in direct contact with the radiator metal, and the anode can reach all immersed in the water after the radiator enters the water, wherein the anode (3) Structure (2), the middle of the steel core (3-1), the outer part of the anode material (3-2), in this embodiment anode material using magnesium alloy. In this embodiment, the anode is a rod with a circular cross section, which is shown in FIG. 3. In this way, the primary battery composed of the anode and the radiator is gradually dissolved by the magnesium alloy metal anode added into the radiator to protect the radiator metal from corrosion and prolong the service life of the radiator.

The advantages of the anti-corrosion radiator of the present invention are: simple structure, good internal corrosion resistance; due to its use of sacrificial anode method to prevent corrosion of steel radiators, the radiator system, oxygen consumption, the radiator system from acidic to alkaline , And anti-corrosion, increase the service life and effectiveness, reduce economic loss.

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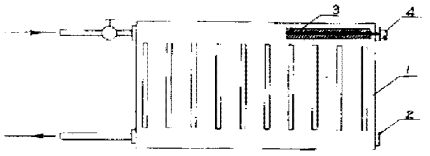
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权利要求书1页 说明书3页 附图页数2页

[54]发明名称 防腐钢制散热器

[57]摘要

本发明涉及一种可以防腐的钢制散热器，特征是散热器内插入至少是一种金属——阳极，阳极至少部分浸放在水中，阳极与散热器间是金属接触。它是利用牺牲阳极法来防止钢制散热器的腐蚀，结构简单，内部防腐性能优良，可以增加钢制散热器及钢制散件接头的使用效果和寿命，减少经济损失。



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权　利　要　求　书

1、一种可以防腐的钢制散热器，其特征在于在其内部插入与散热器不同材质的金属件构成阳极，其相对于被保护体散热器的电位不小于－|800|mV，阳极与散热器之间有金属接触，且阳极至少部分浸入水中。

2、根据权利要求1所述的钢制散热器，其特征在于，阳极与散热器之间可与一直流外接电源相联。

3、根据权利要求1或2所述的钢制散热器，其特征在于，所述阳极和散热器之间存在其它导体。

4、根据权利要求1所述的钢制散热器，其特征在于，所述阳极的材料可选自镁及镁合金、或锌及锌合金、或铝及铝合金等电极材料。

5、根据权利要求1或2所述的钢制散热器，其特征在于，所述阳极可以是整体全由电极材料制成。

6、根据权利要求1或2所述的钢制散热器，其特征在于，所述阳极是由钢棒作为芯，外裹电极材料制成。

7、根据权利要求1的钢制散热器，其特征在于，所述阳极可以是一根或多根截面为圆形或长方形或正方形的棒，片或丝组成，其直径、厚度或宽度一般不大于50mm。

8、根据权利要求1所述的钢制散热器，其特征在于，所述阳极放置在散热器中不加固定。

9、根据权利要求1所述的钢制散热器，其特征在于，所述阳极与散热器固定在一起。

10、根据权利要求8所述的钢制散热器，其特征在于，所述阳极可固定在放气阀上。

11、根据权利要求8所述的钢制散热器，其特征在于，所述阳极可固定在丝堵上。

说　明　书

防腐钢制散热器

本发明涉及一种可以防止腐蚀的钢制散热器，它是属于供暖器材的技术改进。

钢制散热器是目前使用较多的一种供暖设备，供暖设备采用开式水箱，水中含氧量一般大于 0.1mg/升，它引起了钢制散热器及钢制散件和接头处的腐蚀，时间长了，壁面发生穿孔，而漏水，有些供暖小区一天可以漏掉约 80 吨水。由于内部的腐蚀，不仅是影响使用效果和寿命，且坏另件须更换，造成不同程度的经济损失。而且，漏水会损坏家具，引起其它经济损失。国外技术是采取封闭系统，使其隔离氧，来减少腐蚀，缺点是其体积大，维修难，投资大。由于采用国外技术花费大，而国内一般使用钢制散热器的内部腐蚀现象较严重，影响了钢制散热器的使用寿命和效果。

本发明的目的在于提供一种采用加入金属阳极，防止腐蚀的钢制散热器。此散热器结构简单，利用牺牲阳极来消耗系统中的氧或吸收氧，又使系统的水渐呈现碱性达到防腐目的。

本发明的目的是通过以下技术措施来实现的。

钢铁在水或水溶液环境中，主要腐蚀为电化学腐蚀。将电极电位低于铁的金属于散热器连接，构成原电池，插入的金属为阳极而缓慢溶解，散热器的钢铁作为阴极避免了腐蚀，而得到了保护，这样就形成了本发明的防腐蚀的散热器。

在钢制散热器内部插入与散热器不同材质的金属件构成阳极，阳极相对于钢制散热器的电位不少于 $-|800|$mV，阳极与散热器之间必须有金属接触，且阳极至少部分浸入水中，优选全部浸入水中。为了强化保护效果，阳极与散热器之间也可与一直流外接电源相联。所述阳极可与散热器直接接触，来保证它们之间的导电性，也可在阳极和散热器之间存在其它导体，

通过其它导体的连接来保证它们之间的导电性。所述阳极的材料可选自镁及镁合金、或锌及锌合金、或铝及铝合金等电极材料。所述阳极可以是整体全由电极材料制成，也可以是由钢棒作为芯，外裹电极材料制成。所述阳极可以是一根或多根截面为圆形或长方形或正方形的棒，片或丝组成，其直径、厚度或宽度一般不大于 50mm 。阳极可放置在散热器中不加固定，或将所述阳极与散热器固定在一起。比如，可固定在放气阀上，或固定在丝堵上。

附图图面说明

附图 1　本发明散热器结构图

附图 2　本发明散热器所使用阳极结构图

附图 3　本发明散热器阳极截面图例

下面结合本发明一优选实施例及其附图对本发明进行更详细的说明，但本发明并不以任何方式限制在实施例范围内，凡未脱离本发明精神的任何结构上的变动或材料的更换，均应包括在本发明范围内。

实施例

参见附图 1，为本发明散热器的结构图。图中符号分别为散热器体（1），丝堵（2），阳极（3），放气阀（4）。由图可知，此实施例中采用焊接技术，将阳极焊接在散热器内部，阳极金属与散热器金属直接接触，且在散热器进水后，阳极能达到全部浸入水中，其中阳极（3）的结构参见附图（2），中间为钢芯（3－1），外部为阳极材料（3－2），此实施例中阳极材料使用镁合金。此实施例中阳极为截面为圆形的棒，参加附图 3 。这样在由阳极和散热器组成的原电池中，散

热器中加入的镁合金金属阳极被渐渐溶解，保护了散热器金属，使之不受腐蚀，延长了散热器的使用寿命。

本发明防腐散热器的优点是：结构简单，内部防腐性能好；由于其用牺牲阳极法来防止钢制散热器的腐蚀，使散热器系统中氧消耗，散热器系统由酸性逐渐变为碱性，而防腐，增加了使用寿命和效果，减少经济换失。

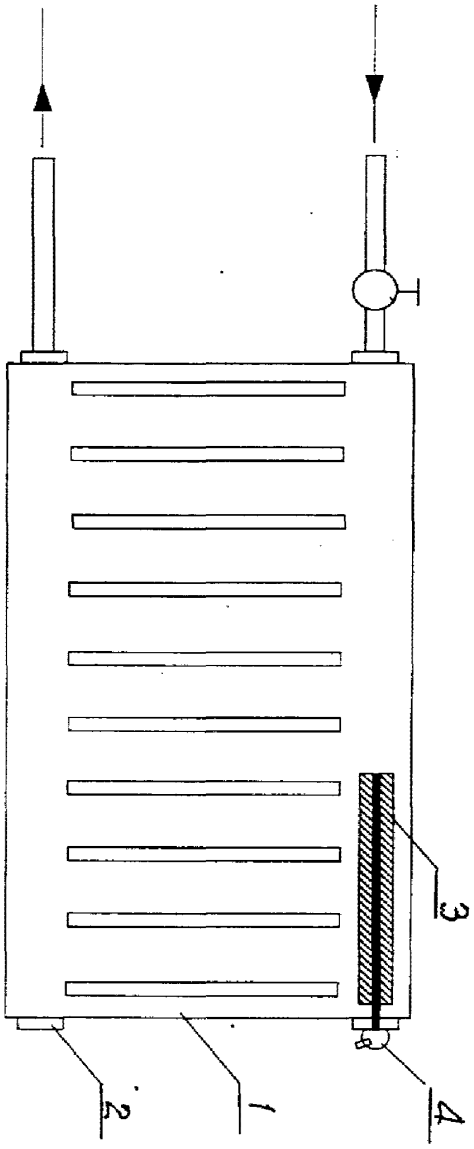


图 1

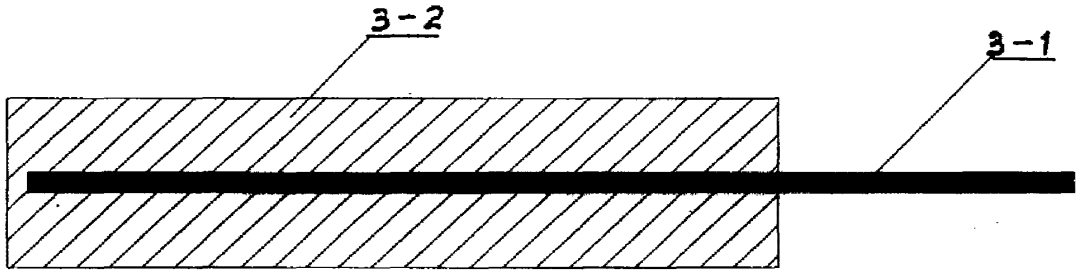


图 2

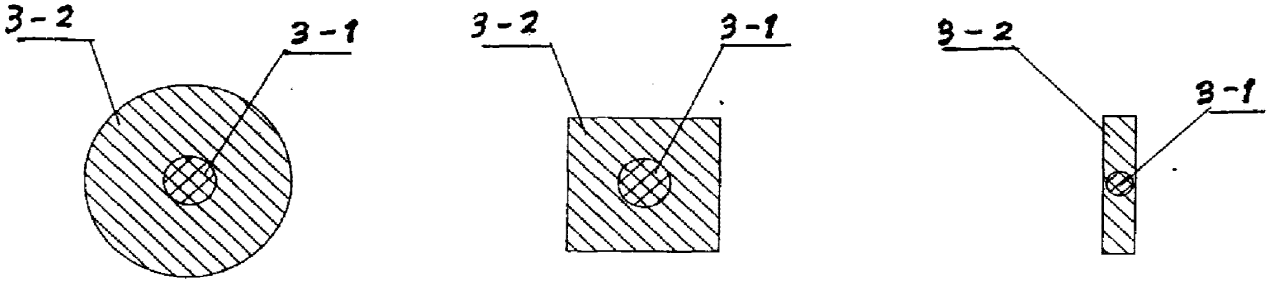


图 3

Espacenet

Bibliographic data: KR20090112853 (A) — 2009-10-29

COOLING SYSTEM

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Classification: **- international:** ***F01P3/04; F01P5/02; F01P5/10***
- cooperative: **F01P11/06**; **F01P3/04**; F01P2011/066; F01P2050/22; F01P5/02; F01P5/10 more

Application number: KR20080038583 20080425 Global Dossier

Priority number(s): KR20080038583 20080425

Abstract of KR20090112853 (A)

PURPOSE: A chiller is provided to increase fuel efficiency and thermal efficiency by removing scale from with interface activity and preventing corrosion of a conduit line. CONSTITUTION: A tub is located around a combustion chamber and has a discharging hole and a collecting hole of a thermal medium. A radiator(14) has the discharging hole and collecting hole of the tub and an inlet and an outlet connecting hoses. A pump forcibly circulates the thermal medium to the tub and radiator. A fan cools the radiator with an air cooling mode.

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CLAIMS KR20090112853

1. It is provided around the combustion chamber and the heating medium is discharged. This water tank has a water recovery tank and has a water tank. The mouth which is connected to the hose by each withdrawal port. And a fan for cooling the heat radiator by a cooling method. The cooling apparatus is characterized in that the heat exchanger is provided with a heat exchanger for circulating the heat medium through the water tank and the radiator, Wherein a cathode generator is embedded in the cathode.

2. The cooling device according to claim 1, further comprising a lead wire electrically connecting the cathode generator and the radiator.

3. The cooling device according to claim 1, wherein a quantum energy generating element is embedded in the cathode generating element.

4. The heat exchanger according to claim 1, wherein the cathode generator is disposed in the mouth of the radiator. A cooling device embedded in any one of the outlets.

5. The cooling device according to claim 1, wherein the cathode-generating member comprises a porous housing having a hollow tube shape having open ends at both ends, a cathode generating element embedded in the housing, and a finishing material covering both ends of the housing.

6. The cooling device according to claim 1, wherein the cathode-generating member has a hollow tube shape and has an uneven surface for increasing the contact area with the heating medium on the inner surface thereof.

7. The cooling device according to claim 1, wherein the cathode generating element is a porous disk-shaped cathode generating element arranged at regular intervals using a nonconductive spacing element in the cross direction of the heat medium flow.

8. 2. The cathode-ray tube according to claim 1, wherein the cathode-generating member is a cathode-ray tube, wherein the cathode-generating elements formed in a porous disc shape are arranged at equal intervals using a non- A cooling device incorporating cathode-forming elements in the form of granules.

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DESCRIPTION KR20090112853

Cooling system

BACKGROUND OF THE INVENTION 1. Field of the Invention The present invention relates to a cooling apparatus for preventing overheating of an internal combustion engine and for maintaining a proper temperature, and more particularly, to a cooling apparatus capable of improving the heat exchange efficiency as well as the fuel consumption by using a cathode system (cathode protection).

The cooling device of the internal combustion engine is mainly a water-cooling type, and includes a water tank and a radiator provided around the combustion chamber as shown in Fig. 1, a pump for forcibly circulating the heat medium (water) through a water tank and a radiator, And a thermostat that raises the heating medium to a proper temperature quickly and immediately after starting. The cooling system of the water-cooling type constituted as described above is a cooling system in which the heat generated in the combustion chamber, which is continuously and repeatedly formed by four strokes of the internal combustion engine leading to suction, compression, explosion and exhaust, is absorbed by the heat medium in the water tank, To prevent overheating of the combustion chamber and to maintain the combustion conditions. However, when the performance of the cooling device is deteriorated, for example, when the heat of the surrounding structures of the engine excessively rises, deformation or the oil film on the inner wall of the combustion chamber (cylinder) is destroyed, As a result, the combustion efficiency is lowered as well as the combustion efficiency such as the knocking or the early ignition is suddenly decreased, and the cooling device plays a very important role in the performance of the engine. As described above, in order to improve the performance of the cooling device and to reduce the weight thereof, an internal combustion engine and a radiator using an aluminum alloy have recently been proposed and popularized. In such an aluminum alloy, corrosion caused by water as a heat medium, A portion having a large ionization tendency is dissolved or a scale such as rust or impurities due to oxidation is adhered to the inner surface of the cooling device, and the heat exchange efficiency is rapidly deteriorated. Thus, the above-mentioned corrosion and rust inhibiting the occurrence of rust. The coolant is protected by using a coolant such as a corrosion-prevention agent, but the removal of the scale can not be solved and the performance of the cooler is degraded. Therefore, although the structure of the heat medium passage or the heat radiator is improved in order to improve the performance of the cooling device, the effect thereof is low and it is not a fundamental solution.

SUMMARY OF THE INVENTION The present invention has been made in view of the above circumstances, and an object of the present invention is to provide a negative electrode generating body (sacrificial anode) which provides a negative electrode protection by giving a constant potential to a suitable position of a heat medium passage of a cooling device, And to provide a cooling device capable of improving the fuel efficiency as well as the heat exchange efficiency by removing scale by interfacial activity. The object of the present invention is achieved by providing a cooling device of a water-cooled type for preventing overheating of an internal combustion engine and maintaining a proper temperature, wherein the cooling device is provided around the combustion chamber and discharges the heating medium. This water tank has a water recovery tank and has a water tank. The mouth which is connected to the hose by each withdrawal port. And a cooling fan for cooling the heat radiator by a cooling method. The cooling device comprises a water tank and a heat radiator, and the cooling water is circulated through the water tank and the radiator in a suitable position By incorporating a cathode generator, it is possible to improve the efficiency of heat exchange and the fuel consumption by removing scales such as corrosion and rust by using the cathode method. The effect of the cooling device of the present invention will be described. The present invention has a cathode generator (sacrificial anode) that provides a constant potential at a suitable position of the flow path of the heat medium, which forms a closed

circulation, to protect the cathode. It is possible to prevent corrosion of pipelines without using rust preventive agents and to remove scales by surface activity, thereby improving heat exchange efficiency and fuel efficiency.

BEST MODE FOR CARRYING OUT THE INVENTION Next, an embodiment of the present invention will be described concretely with reference to the drawings. Fig. 1 shows a cooling apparatus of a general internal combustion engine to which the cooling apparatus according to the present invention is applied. A typical cooling apparatus is provided with a water tank 12 around the combustion chambers 10 and has a water outlet 12a and a water collection port 12b in the water tank 12. [Further, a radiator (14) is provided on the front surface of the water tank (12), and the radiator (14) (12a, 12b) and the hose (13). Outlet 14a. 14b. The heat medium in the water tank 12 and the radiator 14 will be forcibly circulated by the pump and the radiator 14 will be cooled by the air cooling method using the fan 16. In the present invention, a scale such as corrosion or rust is removed in the heat medium circulation duct of the cooling device for cathode ray tube communication at a suitable position of the flow path of the heat medium circulating in the water tank 12 and the radiator 14 of the cooling device constructed as described above And a negative electrode (20). Corrosion of metal is one kind of cell reaction (battery reaction), in which a part having a large ionization tendency is dissolved. Conversely, there is known an electric method for preventing corrosion by applying a potential that is in a floating state to a metal. In order to prevent corrosion by applying a negative current to a target object to be prevented from corrosion, Cathodic protection. In this cathodic method, the external power supply system, the metal with high ionization tendency such as magnesium or zinc, and the object to be protected are electrically connected, and the metal with high ionization tendency is melted and the sacrificial anode method In the present invention, the latter is a sacrificial anode method. 2A and 2B show an example in which the cathode-generating device 20 according to the present invention is embedded in the inlet 14a of the radiator 14 and used. The cathode generator 20 is designed so as not to interfere with the flow rate or flow of the heat medium that is installed and passed through the support structure 11 in the inlet 14a of the heat radiator 14. [

More specifically, the cathode-generating member 20 includes a porous housing 22 made of a stainless steel material having a hollow tube shape having open ends at both ends as shown in FIG. 2B, and a cathode 22, A generating element 24, and a finishing material 26 covering both ends of the housing 22. At this time, the cathode generating element 24 has a substantially rod-like shape, and the outer peripheral surface thereof preferably has an uneven surface such as a screw thread to increase the contact area with the heating medium. Here, the cathode-generating element 24 is preferably made of a material which generates hydrogen by contacting with water, such as magnesium or an alloy containing magnesium as a main component, which performs a reducing action using an electromotive force. Further, a lead wire (30) for electrical connection is provided between the cathode generator (20) and the radiator (14). At this time, the lead wire (30) contacts the upper surface of the radiator (14). The lower cap is mainly made of synthetic resin and is directly connected to the side of the tube 14c which is made of aluminum to negatively channel the channel of the heating medium by making negative electric charges be transmitted to the cathode 14c. More specifically, since the cathode generator 20 has a high ionization tendency, Before the channel is ionized, the cathode generator is first ionized to protect the cathode against the cathode, thereby preventing corrosion and improving durability. The cathode generating element 20 also has at least one or more quantum energy generating elements 28 at both ends of the cathode generating element 24. This quantum energy generating element 28 will function to promote molecular activity between atoms in contact with water. The cathode generator 20 described above can be selectively installed in any one of the inlet or the outlet of the radiator or the outlet 12a or the recovery port 12b and the inside of the hose 13 of the water tank 12 will be. 3 shows another embodiment of the present invention. The cathode-generating member 40 of the present embodiment is formed into a hollow tube shape which is tightly inserted and fixed in the inlet 14a of the radiator 14, And an uneven surface 40a for increasing the contact area with the heating medium. FIG. 4 shows another embodiment of the present invention.

The cathode-generating members 50 of the present embodiment are formed in the form of porous discs and are arranged at regular intervals by using a non-conductive gap-keeping element 52 in the cross direction of the flow of the heat medium. FIG. 5 shows another embodiment of the present invention. In this embodiment, as shown in FIG. 4, cathode-type cathode generating elements 54 are embedded between the porous disc-shaped cathode-generating bodies 50. The water thus contacted with the cathode generator according to the present invention is alkalized due to the potential difference, and thus the alkaline heat medium will act to separate and cause a surfactant effect on the scale adhered in the channel. At this time, the potential difference generated in the electricity generating element 20 is theoretically based on the Nernst Equation. For example, when the partial pressure of hydrogen is 1 bar and the temperature is 25 ° C, the value of the metal potential is -0.6 V or less Is known to reduce hydrogen ions at a sufficient rate upon contact with water. The water is electrolyzed by the electromotive force generated in the cathode-generating member 20 so that the reduction potential is achieved, and the electromagnetic wave generated from the quantum energy generating element 40 promotes molecular activity between water and atoms, So that the effect of further improving the combustion efficiency can be obtained. Such a cooling device of the present invention may be applied to a cooling tower of a building or the like. While the present invention has been particularly shown and described with reference to exemplary embodiments thereof, it is to be understood that the invention is not limited to the disclosed exemplary embodiments.

특허출원서

◎ 참조번호	0001
◎ 출원구분	특허출원
◎ 출원인	
성명	이상진
특허고객번호	4-1998-035185-9
◎ 발명의 국문명칭	냉각장치
◎ 발명의 영문명칭	cooling system
◎ 발명자	
성명	이상진
특허고객번호	4-1998-035185-9

◎ 취지

위와 같이 특허청장에게 제출합니다.출원인 이상진 (인)

◎ 수수료

출원료	0 면 38,000 원
가산출원료	14 면 14,000 원
우선권주장료	0 건 0 원
심사청구료	0 항 0 원
합계	52,000 원
감면사유	개인정보보호를 위해 비공개합니다.
감면후 수수료	15,600 원

특허 명세서

◎ 요약서

요약

이러한 본 발명의 목적은 내연기관의 과열방지와 적온을 유지케 하는 수냉방식의 냉각장치를 제공함에 의해 달성되게 되는데, 이 냉각장치는 연소실의 주위에 구비되고 열매체의 출수.회수구를 가지는 수조를 가지며, 이 수조의 출수.회수구 각각과 호스로 연결되는 입.출구를 갖는 방열기, 그리고 상기 열매체를 상기 수조와 상기 방열기로 강제순환시키는 펌프, 또 상기 방열기를 공냉방식으로 냉각시키기 위한 팬으로 이룬 냉각장치로서, 수조와 방열기로 순환하는 상기 열매체의 유로 적합한 위치에 음극발생체를 내장하여서, 음극방식을 이용해 부식이나 녹 등의 스케일을 제거시키어 열 교환효율을 높이고 연비를 향상시킬 수 있게 된다.

◎ 대표도

2

◎ 명세서

발명의 명칭

냉각장치{cooling system}

발명의 상세한 설명

기술분야

본 발명은 내연기관의 과열방지와 적온을 유지케 하는 수냉방식의 냉각장치에 관한 것으로, 특히 음극방식(음극화보호)을 이용해 열 교환효율은 물론 연비를 향상시킬 수 있는 냉각장치에 관한 것이다.

배경기술

내연기관의 냉각장치는 주로 수냉방식으로서, 도 1에서와 같이 연소실의 주위에 구비되는 수조와 방열기, 그리고 열매체(수)를 수조와 방열기로 강제순환시키는 펌프, 또 방열기를 공냉방식으로 냉각시키기 위한 팬과 시동 직후 열매체를 빠른시간에 적정온도로 상승시키는 서모스탯 등으로 구성되어 있다.

이렇게 구성되는 수냉방식의 냉각장치는 흡입, 압축, 폭발, 배기로 이어지는 내연기관의 4개 행정이 연속적이고 반복적으로 이루는 연소실에서 발생하는 열을 수조내의 열매체가 흡열하여 방열기를 통해 대기로 발산시키는 소기의 냉각작용을 이루어 연소실의 과열을 방지하고 연소조건을 유지케 한 것이다.

그런데 이러한 냉각장치의 성능이 저하되는 경우, 그 일례로 기관의 주변 구조물들의 열이 과도하게 상승하면 변형이나 연소실(실린더) 내벽의 유막이 파괴되어 윤활불량으로 기관을 손상시키거나 연소상태도 나빠지는 결과 노킹이나 조기점화 등으로 출력이 급격히 저하되는 등 연소효율은 물론 연비를 떨어뜨리는 것으로, 냉각장치는 기관의 성능에 매우 중요한 역할을 갖는다.

상기에서와 같이 냉각장치의 성능개선과 경량화를 위하여 근래에 와서는 알루미늄합금을 이용한 내연기관과 방열기가 제시되어 보급되고 있는데, 이러한 알루미늄합금을 이용시 열매체인 물에 의한 부식, 즉 일종의 전지반응이 일어나 이온화 경향이 큰 부분이 용해되거나 산화로 인한 녹이나 불순물 등의 스케일이 냉각장치의 내면에 점착되어 열교환효율을 급격히 떨어뜨리고 있는 것이다.

그리하여 상기에서와 같은 부식이나 녹 발생을 억제하는 방청.방식제 등의 냉각액을 사용하여 냉각장치를 보호케 하고 있으나, 스케일의 제거가 해결되지 못하여 냉각장치의 성능이 저하되고 있는 것이다.

따라서, 냉각장치의 성능 향상을 위해 열매체의 유로 또는 방열기의 구조를 개선하고 있으나, 그 효과가 저조하고 근본적인 해결이 되지 못하고 있는 실정이다.

발명(고안의) 내용

◎ 해결 하고자하는 과제

본 발명은 상기에서와 같은 사정을 고려하여 이루어진 것으로, 그 목적은 냉각장치의 열매체 유로 적합한 위치에 일정한 전위를 주어서 음극화보호를 이루는 음극발생체(희생양극)를 내장하여서, 관로의 부식을 방지하고 계면활성으로 스케일을 제거시키어 열 교환효율은 물론 연비를 향상시킬 수 있는 냉각장치를 제공하는 것이다.

◎ 과제 해결수단

이러한 본 발명의 목적은 내연기관의 과열방지와 적온을 유지케 하는 수냉방식의 냉각장치를 제공함에 의해 달성되게 되는데, 이 냉각장치는 연소실의 주위에 구비되고 열매체의 출수.회수구를 가지는 수조를 가지며, 이 수조의 출수.회수구 각각과 호스로 연결되는 입.출구를 갖는 방열기, 그리고 상기 열매체를 상기 수조와 상기 방열기로 강제순환시키는 펌프, 또 상기 방열기를 공냉방식으로 냉각시키기 위한 팬으로 이룬 냉각장치로서, 수조와 방열기로 순환하는 상기 열매체의 유로 적합한 위치에 음극발생체를 내장하여서, 음극방식을 이용해 부식이나 녹 등의 스케일을 제거시키어 열 교환효율을 높이고 연비를 향상시킬 수 있게 된다.

◎ 효과

본 발명 냉각장치의 효과를 설명하겠다.

본 발명은 폐쇄순환을 이루는 열매체의 유로 적합한 위치에 일정한 전위를 주어서 음극화보호를 이루는 음극발생체(희생양극)를 내장하여서, 별도의 부식.방청제등을 사용하지 않고 관로의 부식을 방지하고 계면활성으로 스케일을 제거시키어 열 교환효율은 물론 연비를 향상시킬 수 있을 것이다.

발명(고안)의 실시를 위한 구체적인 내용

다음 본 발명의 일 실시 예를 도면에 의거하여 구체적으로 설명하겠다. 도 1에는 본 발명에 따른 냉각장치가 적용되는 일반적인 내연기관의 냉각장치를 보고 있다.

통상의 냉각장치는 연소실들(10)의 주위에 수조(12)를 구비하고, 이 수조(12)에 열매체의 출수구(12a)와 회수구(12b)를 갖추고 있다.

또 수조(12)의 전면에는 방열기(14)를 갖는데, 이러한 방열기(14)는 수조(12)의 출수.회수구(12a.12b) 각각과 호스(13)로 연결되는 입.출구(14a.14b)를 갖는다.

그리고 수조(12)와 방열기(14) 내의 열매체는 펌프를 이용해 강제순환시키게 될 것이고, 방열기(14)는 팬(16)을 이용하여 공냉방식으로 냉각시키기게 될 것이다.

본 발명은 상기에서와 같이 구성되는 냉각장치의 수조(12)와 방열기(14)로 순환하는 열매체의 유로 적합한 위치에 냉각장치의 열매체 순환관로내를 음극화보호작용으로 부식이나 녹 등의 스케일을 제거하는 음극발생체(20)를 내장한 것이다.

금속의 부식이란 일종의 전지반응(電池反應)의 하나로서, 일반적으로 이온화 경향이 큰 부분이 용해된다. 역으로, 금속에 마치 부동상태(不動狀態)가 되는 전위를 인가하여 부식을 방지하는 전기방식이 알려져 있는데, 부식을 방지하고자 하는 대상물체에 음극전류를 인가하여 부식을 방지하는 방법을 음극방식(Cathodic protection)이라 한다.

이러한 음극방식에서는 외부전원방식과, 마그네슘이나 아연과 같은 이온화 경향이 큰 금속과 방식 대상물품을 전기적으로 연결해 놓고 이온화 경향이 큰 금속이 용해되고 그 희생으로 말미암아 대상물품을 지키는 희생양극방식을 들을 수 있는데, 본 발명에서는 후자인 희생양극방식을 이용하는 것이다.

도 2a 및 도 2b에는 본 발명에 따른 음극발생장치(20)가 방열기(14)의 입구(14a) 내에 내장되어 사용되는 그 하나 예의 모습을 보이고 있다. 이때 음극발생장치(20)는 방열기(14)의 입구(14a) 내에서 지지구조물(11)에 의지되어 설치되고 통과되는 열매체의 유속 또는 흐름에 지장을 주지 않도록 설계한다.

더 상세하게는, 음극발생체(20)는 도 2b에서와 같이 양단이 개구된 중공의 관 형상으로 이루는 스테인레스스틸재의 다공성 하우징(22)과, 이 하우징(22) 내에 적당한 간격을 유지해 내장되는 음극발생요소(24)와, 그리고 하우징(22)의 양단을 복개하는 마감재(26)로 구성되어 있다. 이때 음극발생요소(24)는 대략 봉형상의 모습을 갖게 되는데, 그 외주면은 열매체와의 접촉면적 증대시키기 위하여 나사산과 같은 요철면을 갖는 것이 바람직할 것이다.

여기서, 음극발생요소(24)는 기전력을 이용한 환원작용을 이루는 마그네슘 또는 마그네슘을 주성분으로 하는 합금 등과 같이 물과 접촉하여 수소를 발생시키는 소재를 선택함이 바람직하다.

또 음극발생체(20)와 방열기(14)의 사이에는 전기적으로 연결을 위한 리드선(30)을 갖는다. 이때 리드선(30)은 방열기(14)의 상.하부캡은 주로 합성수지물로 알루미늄재인 튜브(14c) 측과 직접 연결을 이루어 음전기가 전달되게 하여 열매체의 관로를 음극화시키는, 더 상세하게는 음극발생체(20)는 이온화 경향이 크기 때문에 냉각장치의 관로가 이온화되기 전에 음극발생체가 먼저 이온화되어 관로를 음극보호하여 부식을 방지하고 내구성을 향상시키게 된다.

또한 음극발생체(20)에는 음극발생요소(24)의 양단부에 적어도 하나 이상의 양자에너지발생요소(28)을 갖는다. 이러한 양자에너지발생요소(28)는 물과 접촉하여 원자간의 분자활동을 촉진하는 기능을 수행하게 될 것이다.

상기에서 설명한 음극발생체(20)는 방열기의 입구 또는 출구들 중 어느 하나 또는 수조(12)의 출수구(12a)나 회수구(12b), 그리고 호스들(13) 내측에 선택하여 설치될 수 있을 것이다.

도 3에는 본 발명의 다른 실시 예를 보이고 있는데, 본 실시 예의 음극발생체(40)는 방열기(14)의 입구(14a)에 긴밀히 삽입 고정식으로 설치되는 중공의 관형상으로 이루고 있으며, 그 내면에 열매체와의 접촉면적증대를 위한 요철면(40a)을 갖추어 이루고 있다.

도 4에는 본 발명의 또 다른 실시 예를 보이고 있다. 본 실시 예의 음극발생체들(50)은 다공의 디스크형으로 이루어 열매체 흐름의 교차방향에서 비 전도성의 간격유지요소(52)를 이용해 등 간격으로 배치되어 구성된다.

도 5에는 본 발명의 또 다른 실시 예를 보이고 있다. 본 실시 예는 도 4에서와 같이 다공의 디스크형 음극발생체들(50)의 사이에 알갱이형태의 음극발생요소(54)들을 내장하고 있는 것이다.

이와 같이 구성되는 본 발명 음극발생체에 접촉된 물은 전위차로 인하여 알칼리화되고 이렇게 알칼리화된 열매체는 관로 내에 점착된 스케일에 계면활성효과를 일으켜 분리시키어 주는 작용을 이루게 될 것이다.

이때, 전기발생체(20)에서 발생하는 전위차는 네른스트식(Nernst Equation)에 이론적 근거를 둔 것으로서, 예컨대 수소의 부분압력이 1bar이고 온도가 25℃인 경우 금속전위가 -0.6V이하의 값을 가지는 쌍은 물과 접촉시 수소이온을 충분한 속도로 환원시키는 것으로 알려져 있다.

음극발생체(20)에서 발생하는 기전력에 의해 물이 전기분해되어 환원전위가 이루어지도록 함은 물론 양자에너지발생요소(40)로부터 발생하는 전자파가 물과 원자간의 분자활동을 촉진하여 공명 및 공진현상을 촉진시키고 따라서, 연소효율을 더욱 향상시키는 효과도 얻을 수 있을 것이다.

이러한 본 발명 냉각장치는 건물의 냉각탑 등에도 적용이 가능할 것이다.

이상에서와 같이 본 발명의 일 실시 예에 관해 상세히 설명하였으나, 본 발명은 이에 국한되지 않고 청구범위에 기재된 범위 내에서 변경이 가능할 것이다.

◎ 청구의 범위

◎ 청구항 [1]

연소실의 주위에 구비되고 열매체의 출수.회수구를 가지는 수조를 가지며, 이 수조의 출수.회수구 각각과 호스로 연결되는 입.출구를 갖는 방열기, 그리고 상기 열매체를 상기 수조와 상기 방열기로 강제순환시키는 펌프, 또 상기 방열기를 공냉방식으로 냉각시키기 위한 팬으로 이룬 냉각장치로서,

상기 수조와 상기 방열기로 순환하는 상기 열매체의 유로 적합한 위치에 음극발생체를 내장한 것을 특징으로 하는 냉각장치.

◎ 청구항 [2]

제1항에 있어서,

상기 음극발생체와 상기 방열기의 사이를 전기적으로 연결하는 리드선을 더 포함하는 냉각장치.

◎ 청구항 [3]

제1항에 있어서,

상기 음극발생체에 양자 에너지발생요소가 내장된 것을 포함하는 냉각장치.

◎ 청구항 [4]

제1항에 있어서,

상기 음극발생체를 상기 방열기의 입.출구들 중 어느 하나에 내장한 냉각장치.

◎ 청구항 [5]

제1항에 있어서,

상기 음극발생체는 양단이 개구된 중공의 관형상으로 이루는 다공의 하우징과, 이 하우징에 내장되는 음극발생요소와, 상기 하우징의 양단을 복개하는 마감재로 구성된 냉각장치.

◎ 청구항 [6]

제1항에 있어서,

상기 음극발생체는 중공의 관 형상으로 이루고 그 내면에 열매체와의 접촉면적증대를 위한 요철면을 갖는 냉각장치.

◎ 청구항 [7]

제1항에 있어서,

상기 음극발생체는 다공의 디스크형으로 이룬 음극발생요소들이 상기 열매체 흐름의 교차방향에서 비 전도성의 간격유지요소를 이용해 등 간격으로 배치되어 구성된 냉각장치.

◎ 청구항 [8]

제1항에 있어서,

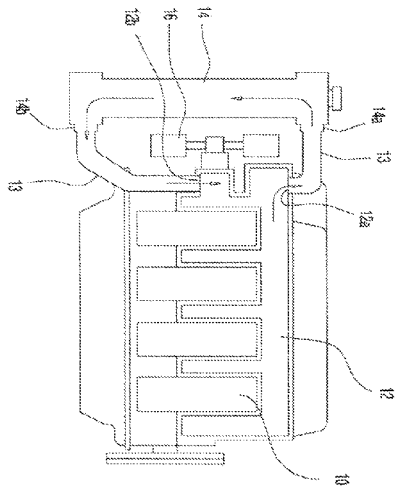
상기 음극발생체는 다공의 디스크형으로 이룬 음극발생요소들이 상기 열매체 흐름의 교차방향에서 비 전도성의 간격유지요소를 이용해 등 간격으로 배치되고, 상기 디스크형의 음극발생요소들 사이에 알갱이형태의 음극발생요소들을 내장한 냉각장치.

◎ 도면

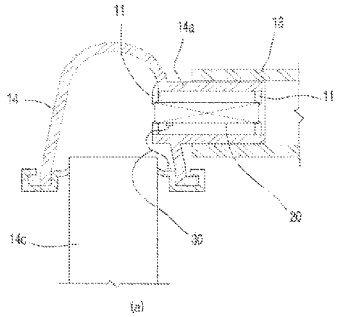
◎

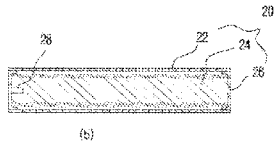
도면



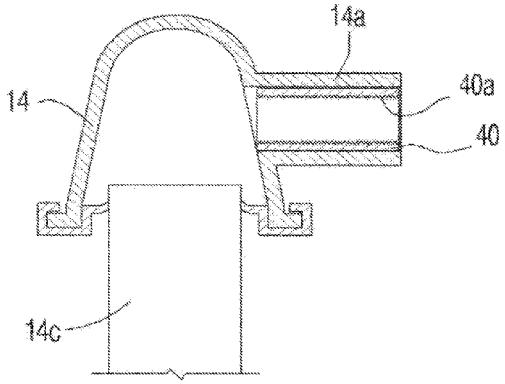

12a
16
14
14a
13
15
13
12a
12
10

[Fig. 2]

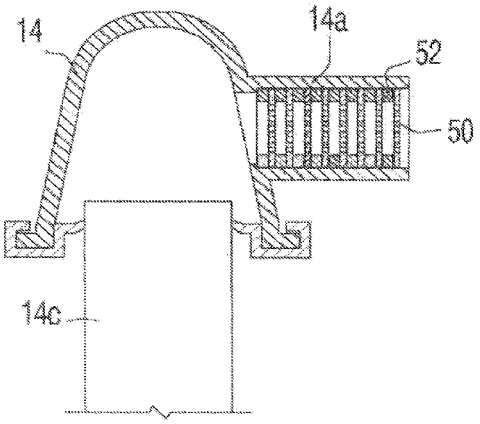

11
14a
13
14
11
30
14c
30
(a)


20
26
22
24
28
(b)

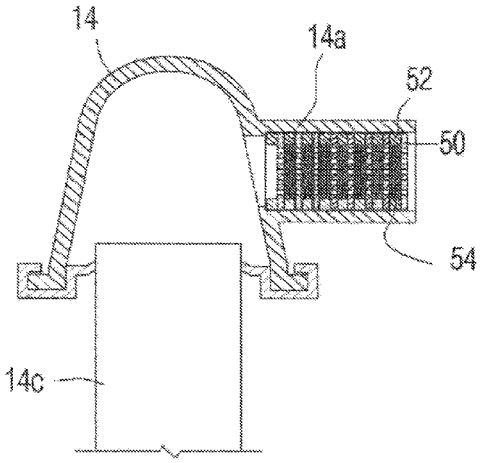
[Fig. 3]


14a
40a
14
40
14c

도면3a



도면3b



Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14452339	PETROSINO, FRANK
	Examiner	Art Unit
	SEAN E VINCENT	3991

CPC- SEARCHED		
Symbol	Date	Examiner
see EAST search history	6-10-15	SV
above up to date	2-9-16	SV

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
see EAST search history	6-10-15	SV
prior prosecution and patent family reviewed	6-10-16	SV
above up to date	2-9-16	SV
SEE EAST SEARCH HISTORY	8-17-17	SV
searches UPDATED, prior prosecution history review UPDATED	1-30-18	SV
(sacrificial anode) (inlet) (radiator) before:priority:20081205 in google patents	1-30-18	SV

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

To: IPTLdocket@velaw.com,sbrown@velaw.com,ggoel@velaw.com
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14452339	CTNF	03/07/2018	PET744/4-001REUS/58000
	892	03/07/2018	PET744/4-001REUS/58000

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UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Frank Petrosino	Art Unit:	3991
Application No.:	14/452,339	Confirmation No.	7313
Filing Date:	08/05/2014	Examiner:	Vincent, Sean E.
		Atty. Docket:	PET744/4-001REUS/58000
Title:	ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE		

RESPONSE TO OFFICE ACTION

VIA EFS WEB

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

Sir:

Applicant respectfully submits this Response to the Nonfinal Office Action of March 7, 2018 (herein "Office Action") and requests favorable action thereon.

This Response is submitted within the three month period. It is believed that no fees are due in connection with this Response; for any fees required in connection with the present communication, the Commissioner is authorized to deduct any such fees from Vinson & Elkins L.L.P. Deposit Account No. 22-0365/PET744/4-001REUS/58000.

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CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. (Original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of aluminum.

3. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of magnesium.

4. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of zinc.

5. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is grounded to a vehicle.

6. (Original) The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. (Original) The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. (Original) The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. (Original) The electrolysis prevention device of claim 1 wherein the wherein the engine heat exchange component is a heater core.

10. (Original) A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. (Original) A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. (**Currently Amended**) A method of preventing corrosion of **a radiator** **[an engine heat exchange component], the method** comprising**:** **[adding or]** installing a sacrificial anode assembly **including a sacrificial anode** within the **radiator** **[heat exchange component], wherein the sacrificial anode is placed within 10 inches of** **[adjacent an]** **a hot liquid** inlet **to the radiator** **[thereof]**.

13. (Original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. (Original) An engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

15. (**Canceled**) **[The method of claim 12, wherein said engine heat exchange component is a radiator.]**

16. (**Currently Amended**) The method of claim 1**[5]**__2__, wherein said sacrificial anode consists essentially of an active metal.

17. (Previously Presented) The method of claim 16, wherein said sacrificial anode consists essentially of aluminum, magnesium, or zinc.

18. (**Currently Amended**) The method of claim 12, wherein __installing the sacrificial anode assembly further comprises:__ **[said sacrificial anode is added or installed]** __installing the sacrificial anode assembly__ in a fitting hole in **[a]** __the__ radiator **[adjacent to said inlet]**.

19. (**Currently Amended**) The method of claim 12, wherein said sacrificial anode is grounded **[to said motor vehicle]**.

20. (**Currently Amended**) The method of claim 12__, wherein installing the sacrificial anode assembly further comprises:__ **[comprising adding or]** installing **[a]** __the__ sacrificial anode assembly within the fluid flow of the __radiator__ **[heat exchange component within 10 inches of the center of an inlet thereof]**.

21. (Previously Canceled)

22. (**Currently Amended**) The method of claim 12, wherein **[said engine heat exchange component]** __the radiator__ comprises **[one or more]** aluminum **[components]**.

23. – 31. (Previously Canceled)

32. (**Canceled**) **[The method of claim 12, wherein the sacrificial anode is installed or added into the heat exchange component within the fluid flow of the heat exchange component.]**

33. (**New**) __The method of claim 12, wherein the hot liquid is coolant.__

34. (**New**) __The method of claim 12, wherein the hot liquid is water.__

35. (**New**) __The method of claim 12, wherein the hot liquid is antifreeze.__

36. (**New**) __The method of claim 12, further comprising installing a second sacrificial anode assembly within the radiator.__

37. (New) **A radiator for use in a motor vehicle, the radiator further comprising:**

a hot liquid inlet to the radiator from an engine of the motor vehicle, the hot liquid inlet providing fluid communication for fluid flow of hot liquid from the engine; and

a sacrificial anode installed within 10 inches of the hot liquid inlet of the radiator.

38. (New) **The radiator of claim 37, wherein the sacrificial anode consists essentially of an active metal.**

39. (New) **The radiator of claim 38, wherein the active metal is at least one of aluminum, magnesium, and zinc.**

40. (New) **The radiator of claim 37 wherein the sacrificial anode is installed in a fitting hole penetrating the radiator.**

41. (New) **The radiator of claim 37 wherein the sacrificial anode is installed onto a surface of the radiator.**

42. (New) **The radiator of claim 37 wherein the sacrificial anode is grounded to the motor vehicle.**

43. (New) **The radiator of claim 37 wherein the radiator comprises aluminum.**

44. (New) **The radiator of claim 37 wherein the radiator enables air-cooling of the hot liquid.**

45. (New) **The radiator of claim 37, further comprising a second sacrificial anode.**

46. (New) **The radiator of claim 37, wherein the hot liquid is coolant.**

47. (New) **The radiator of claim 37, wherein the hot liquid is water.**

48. (New) **The radiator of claim 37, wherein the hot liquid is antifreeze.**

49. (New) **An electrolysis prevention device for preventing corrosion, the electrolysis prevention device comprising:**

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode, the anode holder adapted for installation in an engine radiator within 10 inches of a hot liquid inlet to the engine radiator.

50. (New) **The electrolysis prevention device of claim 49, wherein the sacrificial node comprises aluminum.**

51. (New) **The electrolysis prevention device of claim 49, wherein the sacrificial node comprises magnesium.**

52. (New) **The electrolysis prevention device of claim 49, wherein the sacrificial node comprises zinc.**

53. (New) **The electrolysis prevention device of claim 49, wherein the engine radiator is used in a motor vehicle, and wherein the sacrificial node is grounded to the motor vehicle.**

54. (New) **The electrolysis prevention device of claim 49, wherein the engine radiator comprises aluminum.**

55. (New) **The electrolysis prevention device of claim 49, wherein the anode holder enables the sacrificial anode to be located within fluid flow of the hot coolant inlet.**

56. (New) **The electrolysis prevention device of claim 49, wherein the anode holder is installed in a fitting hole penetrating the engine radiator.**

57. (New) **The electrolysis prevention device of claim 49, wherein the hot liquid is coolant.**

58. (New) **The electrolysis prevention device of claim 49, wherein the hot liquid is water.**

59. (New) **The electrolysis prevention device of claim 49, wherein the hot liquid is antifreeze.**

REMARKS

At the time of the Office Action electronically sent on March 7, 2018, claims 1-20, 22 and 32 were pending in the Application. Claims 21, 23-31 were previously canceled. Claims 12, 16, 18-20, and 22 are amended. Claims 15 and 32 are canceled herein without prejudice to or disclaimer of the claimed subject matter. New claims 33-59 are added. Accordingly, claims 1-14, 16-20, 22, and 33-59 are pending in the application.

Rejections under 35 USC §112

Claim 19 was rejected under 35 U.S.C. §112(b) for being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention. Claim 19 has been amended to correct the lacking antecedent basis for "said motor vehicle". Accordingly, amended claim 19 is now believed to comply with Section 112.

Reconsideration and withdrawal of the rejections under Section 112 are respectfully requested.

Rejections Under 36 USC §102

Claims 12, 15-19 and 32 were rejected under §102(b) as being anticipated by Chinese Patent Application No. 1225998 to Gou Zhangeng ("*Gou*").

Claims 15 and 32. In view of the cancellation of the claims, the rejection of claims 15 and 32 is now moot.

Claims 12 and 16-19. Amended claim 12 recites:

> A method of preventing corrosion of a radiator, the method comprising: installing a sacrificial anode assembly including a sacrificial anode within the radiator, wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator.

Amended claim 12 and its respective dependent claims 16-19 are patentable over *Gou* because the reference does not explicitly or inherently teach each of the features recited in amended claim 12. For example, *Gou* does not explicitly or inherently teach "wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator", as recited in amended claim 12.

Addressing the rejection of claim 12, the Office has cited Figure 1 in *Gou* allegedly anticipating the claim. Although disagreement is respectfully submitted with the rejection, claim 12 has been amended to clarify the claimed subject matter. Figure 1 in *Gou* does not explicitly or inherently teach that "the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator" because in *Gou*, "sacrificial anode 3 mounted on a bleed valve 4" does not explicitly or inherently anticipate "a hot liquid inlet to the radiator", as recited in amended claim 12. A bleed valve is not a hot liquid inlet to a radiator. Thus, there is not any explicit or inherent disclosure in *Gou* that teaches that "the sacrificial anode is placed within 10 inches of a hot liquid inlet", as recited in amended claim 12.

Accordingly, amended claim 12 along with its respective dependent claims are patentable over *Gou*.

Claims 12, 19 and 32 are rejected under §102(b) as being anticipated by U.S. Patent No. 6,109,987 to Watanabe *et al.* ("*Watanabe*").

Claims 32. In view of the cancellation of the claim, the rejection of claim 32 is now moot.

Claims 12 and 19. Amended claim 12, along with its respective dependent claim 19, are patentable over *Watanabe* because the reference does not explicitly or inherently teach each of the features recited in amended claim 12. For example, *Watanabe* does not explicitly or inherently teach "wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator", as recited in amended claim 12.

Watanabe is directed to "A water cooled four-cycle outboard motor" (see *Watanabe*, Abstract) and teaches "a cooling jacket 79" in fluid communication with "a water inlet opening 73 that is disposed so that it will be under the level of water" (*Id.*, col 6, ln 25-67; Figs 1, 6). Accordingly, there is no explicit or inherent teaching in *Watanabe* of "a radiator" as recited in amended claim 12, and thus, Watanabe does not explicitly or inherently anticipate "wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator", as recited in amended claim 12.

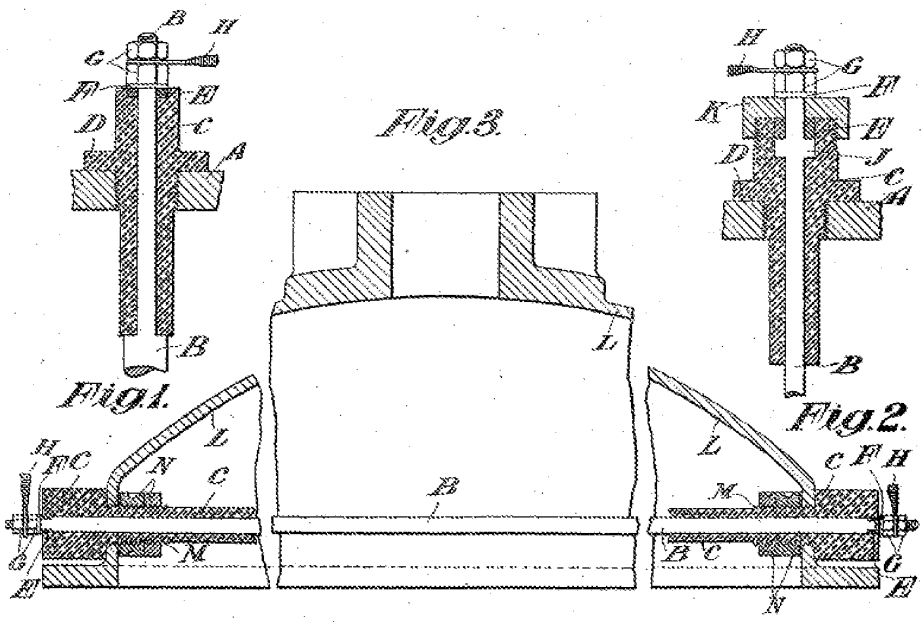
Accordingly, amended claim 12 along with its respective dependent claims are patentable over *Watanabe*.

Claims 12, 15, 20 and 32 are rejected under §102(b) as being anticipated by U.S. Patent No. 1,514,903 to Gush ("*Gush*").

Claims 15 and 32. In view of the cancellation of the claims, the rejection of claims 15 and 32 is now moot.

Claims 12 and 20. Amended claim 12 and its respective dependent claim 20 are patentable over *Gush* because the reference does not explicitly or inherently teach each of the features recited in amended claim 12. For example, *Gush* does not explicitly or inherently teach "wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator", as recited in amended claim 12.

Addressing the rejection of claim 12, the Office has cited *Gush* allegedly disclosing "[t]he top ("L") of a downflow radiator or the cooling water manifold ("O") through which hot water was known to flow from an engine into a radiator" (see Office Action, pg 6). It is respectfully submitted that neither the radiator "L" nor the cooling water manifold "O" in *Gush* inherently or explicitly teaches "wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator". The cooling water manifold "O" appears to be a component of "an internal combustion engine" and not a part of a radiator (see *Gush*, pg 2, col 1, ln 20-29; Figs 4, 5). Furthermore, there is no explicit or inherent disclosure of any "inlet to the radiator" in *Gush* and the depiction of radiator "L" in *Gush* does not explicitly show or describe "a hot liquid inlet to the radiator", as recited in amended claim 12. Neither does Gush ever expressly or inherently disclose that "***the sacrificial anode is placed within 10 inches of a hot liquid inlet*** to the radiator", as recited in amended claim 12, emphasis added. The mere disclosure in Gush of "a rod extending across within the top of a radiator L" (Id., pg 2, col 1, ln 12-15; Fig 3) does not explicitly or inherently anticipate "wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator", as recited in amended claim 12. Figures 1-3 in *Gush* are copied below for reference and it is respectfully submitted that radiator "L" does not explicitly or inherently teach "wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator", as recited in amended claim 12.



Figures 1, 2, and 3 in *Gush*.

Accordingly, amended claim 12 along with its respective dependent claims are patentable over *Gush*.

Reconsideration and withdrawal of the rejections under Section 102 are respectfully requested.

Rejections Under 35 USC §103

Claim 22 is rejected under §103 as being unpatentable over *Gou* in view of U.S. Patent No. 5,649,591 to Green ("*Green*"). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) -- cited from MPEP 2143.03. Accordingly, amended claim 22 is patentable over *Gush* in view of *Green*.

Reconsideration and withdrawal of the rejections under Section 103 are respectfully requested.

New Claims

New claims 33-59 are submitted and are believed allowable. The Office is respectfully requested to enter new claims 33-59 and allow all the pending claims as early as possible.

CONCLUSION

It is believed that this is a full and complete response to all matters raised in the Office Action. Reconsideration and early allowance of all pending claims are respectfully requested.

Should the Examiner have any questions or consider a telephone call helpful, please feel free to contact the undersigned.

Respectfully submitted,

/Stephen C. Stout/

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Attorney for Applicant

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Date: May 2, 2018

Electronic Acknowledgement Receipt	
EFS ID:	32515643
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Stephen Charles Stout/Bobbie Melder
Filer Authorized By:	Stephen Charles Stout
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	02-MAY-2018
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Time Stamp:	16:55:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

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	20180502ResponseNFOA.pdf	469182 3f3ce4c337f3fd37414a72f0e070d09d95633b37	no	12
Warnings:					

Information:	
Total Files Size (in bytes):	469182

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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/452,339	Filing Date 08/05/2014	☐ To be Mailed

ENTITY: ☐ LARGE ☐ SMALL ☒ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	05/02/2018	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 47	Minus	** 22	= 25	X $25 =	625
	Independent (37 CFR 1.16(h))	* 5	Minus	***3	= 2	X $115 =	230
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	855

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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.

LIE
RHONDA BELL

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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000	7313

21586 7590 07/23/2018

VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

EXAMINER
VINCENT, SEAN E

ART UNIT	PAPER NUMBER
3991	

NOTIFICATION DATE	DELIVERY MODE
07/23/2018	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):

IPTLdocket@velaw.com
sbrown@velaw.com
ggoel@velaw.com

Office Action Summary	Application No. 14/452,339	Applicant(s) PETROSINO, FRANK	
	Examiner SEAN E. VINCENT	Art Unit 3991	AIA (First Inventor to File) Status No

-- 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* MONTHS 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 *5-2-18*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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) *1-14,16-20,22 and 33-59* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☒ Claim(s) *1-11,13 and 14* is/are allowed.

7)☒ Claim(s) *12,16-20,22 and 33-59* 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 *8-5-14* 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).

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)).

** 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/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application is being examined under the pre-AIA first to invent provisions.

Reissue Applications

For reissue applications filed before September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the law and rules in effect on September 15, 2012. Where specifically designated, these are "pre-AIA" provisions.

For reissue applications filed on or after September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the current provisions.

Priority

US Patent 8,236,145 (hereafter referred to as "The '145 Patent") claimed priority to US Provisional application No. 61/120,296 filed on Dec. 5, 2008. The Application Data Sheet submitted December 29, 2015 correctly states the domestic priority claim.

Status of the Claims

Original claims 1-11, 13 and 14 from the '145 Patent are presented.

Original claim 12 is proposed to be amended.

New claims 16-20, 22 and 33-59 are proposed to be added by present reissue.

New claims 15, 21 and 23-32 have been canceled.

Objection to improper Claim Format

The amendment filed May 2, 2018 proposes amendments to claims 16-20 and 22 that do not comply with 37 CFR 1.173(b), which sets forth the manner of making amendments in reissue applications. **All new claims should be underlined in their entirety (See MPEP 1453).**

Furthermore, the amendment failed to provide an explanation of support in the disclosure of the patent for the changes made to the claims. Subsequent amendments must include an explanation of support for new claims:

> 37 CFR 1.173(c): Status of claims and support for claim changes. Whenever there is an amendment to the claims pursuant to paragraph (b) of this section, there must also be supplied, on pages separate from the pages containing the changes, the status (i.e., Original, Amended, Previously Amended, New, or Canceled), as of the date of the amendment, of all patent claims and of all added claims, and an explanation of the support in the disclosure of the patent for the changes made to the claims.

Patent owner has been previously advised about improper claim format and lack of an explanation of support for new claims and claim changes in the Final Rejection mailed February 24, 2016. These requirements cannot be waived.

Claim Construction

In col. 6, lines 52-55, the '145 Patent says: “The specific inlet connection 16 varies by vehicle make, model and model year, but the inlet 17 is generally understood to refer to the vicinity of where hot water coming directly from the engine enters into the radiator 11.” Patent Owner’s remarks submitted May 24, 2016 on page 7 profess the intention for the term inlet to indicate an opening in the wall of the heat exchange

component through which hot water from the engine flows. Therefore, the “inlet" will be considered to mean an opening in the wall of the heat exchange component through which hot water from the engine flows.

Claims 50-53 state “the sacrificial node”. The claims will be construed as referring to "the sacrificial anode", but they should be corrected.

Claim Rejections - 35 USC § 112

Previous rejections are withdrawn in light of the most recent amendments.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 36 and 45 are rejected under 35 U.S.C. 112 first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 36 and 45 require installing a second sacrificial anode assembly within the radiator. Patent Owner has provided no indication of support for the installation of a second sacrificial anode. A cursory review of the originally filed specification and drawings reveals no indication of support for a

plurality of sacrificial anodes. Therefore, a person of skill in the art would not have been able to determine that the inventor had possession of methods or radiators employing a second sacrificial anode.

Claim Rejections - 35 USC § 102

The rejections under USC § 102 have been withdrawn in light of the newly submitted amendments.

Claim Rejections - 35 USC § 103

Claims 12, 16-20, 33-42, 44-53 and 55-59 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Gou Zhangeng (CN1225998, hereafter "Gou").

With regard to claims 12 and 37, Gou teaches a radiator 1 (also referred to as the 'heat sink') with a sacrificial anode 3 mounted on a bleed valve 4, both of which are located near the upper inlet of the radiator through a hole fitted for the bleed valve (see figure 1 and the machine translation of page 2 of the Chinese patent). Gou also states that "The anode may be placed unsecured in the heat sink, or the anode and heat sink may be secured together. For example, can be fixed on the deflation valve, or fixed on the plug. "

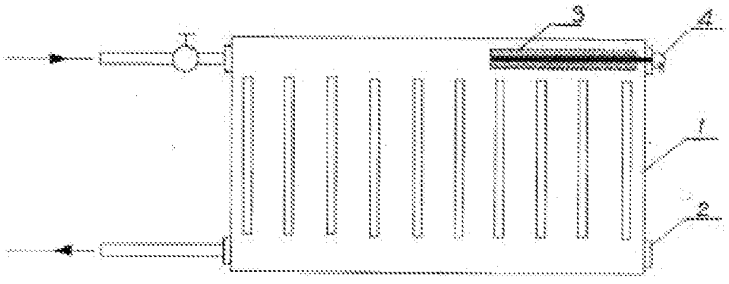


图 1

Gou figure 1 illustrates the anode assembly to be within the fluid flow path of the radiator. Also, page 3 of the translation of Gou, lines 8-9 state "and the anode can reach all immersed in the water after the radiator enters the water" (sic).

Gou does not teach that the anode is within 10 inches of a hot liquid inlet to the radiator. The '145 Patent expresses in col. 7, lines 38-43 that various anode locations within the radiator and that the desirable locations were within 10 inches of the center axis of the inlet connection. However, no reasoning was set forth to define 10 inches as a critical distance. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to locate the anode of Gou within 10 inches of the radiator inlet because the ideal location would have depended on the actual size of the radiator and the Gou anode would not have performed differently from the claimed anode.

With regard to claims 16, 17, 38 and 39, Gou claim 4 discloses a magnesium anode.

With regard to claims 18 and 40, the hole into which the bleed valve of Gou is installed teaches the claimed requirement for said sacrificial anode to be installed in a fitting hole in a radiator adjacent to said inlet.

With regard to claims 19 and 42, the Gou anode being mounted in a hole in a radiator made of steel would necessarily make the anode grounded to a motor vehicle using said radiator for heat exchange. Gou further teaches that the anode is soldered inside the radiator with the anode in direct contact with the radiator metal (page 3, penultimate paragraph).

With regard to claims 33-35 and 46-48, Gou teaches that the hot liquid is water. Official notice is taken that coolant and antifreeze are equivalent to water in the art of radiator cooling.

With regard to claims 36 and 45 Gou does not teach a second sacrificial anode. The ‘145 Patent does not describe a new or unexpected result for the addition of a second sacrificial anode. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a second anode into the radiator of Gou because it would have been a mere duplication of parts (see MPEP 2144.04 V.B.).

With regard to claim 41, Gou teaches that the anode can be secured or unsecured in different locations within the radiator. This satisfies the claim requirement that the anode is installed onto a surface of the radiator.

With regard to claim 44, Gou teaches that its anode prevented corrosion inside of the radiator, thus preserving its effectiveness as a radiator for air-cooling hot liquid.

With regard to claim 49, Gou teaches an electrolysis prevention device comprising a sacrificial anode inside of an engine radiator as described above in the rejection of claims 12 and 37. Gou secures its anode inside the radiator and exemplary securing means such as a bleed valve or a drain plug are taught, but Gou does not explicitly teach an anode holder. As discussed above, it would have been obvious to locate the anode within 10 inches of a hot liquid inlet to the radiator. Since the securing means taught by Gou would perform no differently than the claimed anode holder, the claim requirements are met by Gou.

With regard to claims 50-53, Gou teaches aluminum, magnesium and zinc as possible anode materials.

With regard to claim 55, Gou figure 1 illustrates the anode assembly including any anode holder to be within the fluid flow path of the radiator. Also, page 3 of the translation of Gou, lines 8-9 state "and the anode can reach all immersed in the water after the radiator enters the water" (sic).

With regard to claim 56, the hole into which the bleed valve of Gou is installed fulfulls the claimed requirement for said sacrificial anode and anode holder to be installed in a fitting hole in a radiator adjacent to said inlet.

With regard to claims 57-59, Gou teaches that the hot liquid is water. Official notice is taken that coolant and antifreeze are equivalent to water in the art of radiator cooling.

Claims 12, 20 and 33-36 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Gush (US 1,514,903).

With regard to claim 12, Gush teaches a radiator having an anticorrosion electrode bar extending across the top of the radiator (see figures 1-3 and page 1, lines 90-104 and page 2, lines 12-19 and 35-44). Gush also teaches the application of an anticorrosion electrode to a cooling water manifold (page 2, lines 20-29). The top (“L") of a downflow radiator or the cooling water manifold (“O”) through which hot water was known to flow from an engine into a radiator is taught by Gush to contain anticorrosion electrodes at their centers. Figure 5 of Gush shows electrode P centered between two fluid openings in a triangular shaped manifold. Clearly, the shape of the manifold is dictated by the flow of cooling water downward under the force of gravity from the two upper openings to the single lower opening. Therefore, the electrode P is adjacent the inlet opening of the manifold.

Gush does not explicitly teach that the anticorrosion electrodes are within 10 inches of a hot liquid inlet to the radiator. The ‘145 Patent expresses in col. 7, lines 38-43 that various anode locations within the radiator and that the desirable locations were within 10 inches of the center axis of the inlet connection. However, no reasoning was set forth to define 10 inches as a critical distance. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to locate the anode of Gush within 10 inches of the radiator inlet because the ideal location would have depended on the actual size of the radiator and the Gush anode would not have performed differently from the claimed anode.

With regard to claim 20, the electrode P of Gush is effectively within the fluid flow as illustrated in figure 5.

With regard to claims 33-35, Gush anticipates cooling water. Official notice is taken that coolant and antifreeze are equivalent to water in the art of radiator cooling.

With regard to claim 36 Gush does not teach a second sacrificial anode. The '145 Patent does not describe a new or unexpected result for the addition of a second sacrificial anode. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a second anode into the radiator of Gush because it would have been a mere duplication of parts (see MPEP 2144.04 V.B.).

Claims 22, 43 and 54 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Gou in view of Green (US 5,649,591).

Gou does not teach that the radiator or cooling manifold comprises one or more aluminum components. The problem of electrolytic activity in the presence of aluminum components is discussed by Green in col. 1, lines 33-39 and sacrificial anodes are discussed for solving the problem in col. 1, lines 46-52. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the known sacrificial anode method of Gou to an aluminum containing radiator because Green explains the utility of incorporating sacrificial anodes into modern aluminum-containing devices.

Response to Arguments

Applicant's arguments filed May 2, 2018 have been fully considered but they are not persuasive. The arguments regarding the application of Watanabe, Gou and Gush to anticipation rejections are no longer applicable as those rejections have been withdrawn.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Claims 12, 16-20, 22 and 33-59 are rejected.

Claims 1-11, 13 and 14 are allowable.

Applicant is reminded of the continuing obligation under 37 CFR 1.178(b), to timely apprise the Office of any prior or concurrent proceeding in which Patent No. 8,236,145 is or was involved. These proceedings would include interferences, reissues, reexaminations, and litigation.

Applicant is further reminded of the continuing obligation under 37 CFR 1.56, to timely apprise the Office of any information which is material to patentability of the claims under consideration in this reissue application.

These obligations rest with each individual associated with the filing and prosecution of this application for reissue. See also MPEP §§ 1404, 1442.01 and 1442.04.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN E. VINCENT whose telephone number is (571)272-1194. The examiner can normally be reached on M-F 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Stein can be reached on (571) 272-1544. 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

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/SEAN E VINCENT/
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14452339	PETROSINO, FRANK
	Examiner	Art Unit
	SEAN E VINCENT	3991

CPC- SEARCHED		
Symbol	Date	Examiner
see EAST search history	6-10-15	SV
above up to date	2-9-16	SV

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
see EAST search history	6-10-15	SV
prior prosecution and patent family reviewed	6-10-16	SV
above up to date	2-9-16	SV
SEE EAST SEARCH HISTORY	8-17-17	SV
searches UPDATED, prior prosecution history review UPDATED	1-30-18	SV
(sacrificial anode) (inlet) (radiator) before:priority:20081205 in google patents	1-30-18	SV
searches UPDATED, prior prosecution history review UPDATED	7-6-18	SV

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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Application	Document	Mailroom Date	Attorney Docket No.
14452339	CTFR	07/23/2018	PET744/4-001REUS/58000

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PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

Electronic Acknowledgement Receipt

EFS ID:	33601731
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Gaurav Goel/Bobbie Melder
Filer Authorized By:	Gaurav Goel
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	31-AUG-2018
Filing Date:	05-AUG-2014
Time Stamp:	13:51:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response After Final Action	20180831ResponseFOA.pdf	528965 83c58908ef782697ae95ba4a8e872b1cedd04feb	no	16

Warnings:

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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Frank Petrosino	Art Unit:	3991
Application No.:	14/452,339	Confirmation No.	7313
Filing Date:	08/05/2014	Examiner:	Vincent, Sean E.
		Atty. Docket:	PET744/4-001REUS/58000
Title:	ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE		

RESPONSE TO FINAL OFFICE ACTION

VIA EFS WEB

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

Sir:

Applicant respectfully submits this Response to the Final Office Action dated July 23, 2018 (herein "Office Action") and requests favorable action thereon.

This Response is submitted within the two month period. It is believed that no fees are due in connection with this Response; for any fees required in connection with the present communication, the Commissioner is authorized to deduct any such fees from Vinson & Elkins L.L.P. Deposit Account No. 220365/PET744/4-001REUS/58000.

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CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. (Original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of aluminum.

3. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of magnesium.

4. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of zinc.

5. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is grounded to a vehicle.

6. (Original) The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. (Original) The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. (Original) The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. (Original) The electrolysis prevention device of claim 1 wherein the wherein the engine heat exchange component is a heater core.

10. (Original) A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. (Original) A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. (Previously Presented) A method of preventing corrosion of a radiator, the method comprising: installing a sacrificial anode assembly including a sacrificial anode within the radiator, wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator.

13. (Original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. (Original) An engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

15. (Previously Canceled)

16. (Currently Amended) The method of claim 12, wherein said sacrificial anode consists essentially of an active metal.

17. (Previously Presented) The method of claim 16, wherein said sacrificial anode consists essentially of aluminum, magnesium, or zinc.

18. (Previously Presented) The method of claim 12, wherein installing the sacrificial anode assembly further comprises: installing the sacrificial anode assembly in a fitting hole in the radiator.

19. (Currently Amended) The method of claim 12, wherein said sacrificial anode is grounded.

20. (Previously Presented) The method of claim 12, wherein installing the sacrificial anode assembly further comprises: installing the sacrificial anode assembly within the fluid flow of the radiator.

21. (Previously Canceled)

22. (Previously Presented) The method of claim 12, wherein the radiator comprises aluminum.

23. – 32. (Previously Canceled)

33. (New) The method of claim 12, wherein the hot liquid is coolant.

34. (New) The method of claim 12, wherein the hot liquid is water.

35. (New) The method of claim 12, wherein the hot liquid is antifreeze.

36. (New) The method of claim 12, further comprising installing a second sacrificial anode assembly within the radiator.

37. (New) A radiator for use in a motor vehicle, the radiator further comprising:

a hot liquid inlet to the radiator from an engine of the motor vehicle, the hot liquid inlet providing fluid communication for fluid flow of hot liquid from the engine; and

a sacrificial anode installed within 10 inches of the hot liquid inlet of the radiator.

38. (New) The radiator of claim 37, wherein the sacrificial anode consists essentially of an active metal.

39. (New) The radiator of claim 38, wherein the active metal is at least one of aluminum, magnesium, and zinc.

40. (New) The radiator of claim 37 wherein the sacrificial anode is installed in a fitting hole penetrating the radiator.

41. (New) The radiator of claim 37 wherein the sacrificial anode is installed onto a surface of the radiator.

42. (New) The radiator of claim 37 wherein the sacrificial anode is grounded to the motor vehicle.

43. (New) The radiator of claim 37 wherein the radiator comprises aluminum.

44. (New) The radiator of claim 37 wherein the radiator enables air-cooling of the hot liquid.

45. (New) The radiator of claim 37, further comprising a second sacrificial anode.

46. (New) The radiator of claim 37, wherein the hot liquid is coolant.

47. (New) The radiator of claim 37, wherein the hot liquid is water.

48. (New) The radiator of claim 37, wherein the hot liquid is antifreeze.

49. (New) An electrolysis prevention device for preventing corrosion, the electrolysis prevention device comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode, the anode holder adapted for installation in an engine radiator within 10 inches of a hot liquid inlet to the engine radiator.

50. (New) The electrolysis prevention device of claim 49, wherein the sacrificial anode comprises aluminum.

51. (New) The electrolysis prevention device of claim 49, wherein the sacrificial anode comprises magnesium.

52. (New) The electrolysis prevention device of claim 49, wherein the sacrificial anode comprises zinc.

53. (New) The electrolysis prevention device of claim 49, wherein the engine radiator is used in a motor vehicle, and wherein the sacrificial anode is grounded to the motor vehicle.

54. (New) The electrolysis prevention device of claim 49, wherein the engine radiator comprises aluminum.

55. (New) The electrolysis prevention device of claim 49, wherein the anode holder enables the sacrificial anode to be located within fluid flow of the hot coolant inlet.

56. (New) The electrolysis prevention device of claim 49, wherein the anode holder is installed in a fitting hole penetrating the engine radiator.

57. (New) The electrolysis prevention device of claim 49, wherein the hot liquid is coolant.

58. (New) The electrolysis prevention device of claim 49, wherein the hot liquid is water.

59. (New) The electrolysis prevention device of claim 49, wherein the hot liquid is antifreeze.

REMARKS

At the time of the Office Action electronically sent on July 23, 2018, claims 1-14, 16-20, 22, and 33-59 were pending in the Reissue Application. Claims 15, 21, and 23-32 were previously canceled. New claims 33-59 were previously proposed to be added. Accordingly, claims 1-14, 16-20, 22, and 33-59 remain pending in the application. The previously issued patent, U.S. Pat. No. 8,236,145, is referred to throughout these Remarks as the "'145 Patent."

Objection to the Claims

The claims were objected to for improper claim format in a Reissue Application according to 37 C.F.R. § 1.173. The status and explanation of support for the previously amended claims is provided below. Furthermore, new claims 33-59 have been underlined in their entirety, and claims 50-53 have been corrected to recite "anode" as indicated by the Office.

Claims 1-11 (Original)

Claim 12 (Previously Amended) The amendments to previous claim 12 are supported at least at col 7, ln 29-43 of U.S. Patent No. 8,236,145.

Claims 13-14 (Original)

Claim 15 (Previously Canceled)

Claim 16 (Previously Amended) Claim 16 was previously amended to refer to claim 12 instead of canceled claim 15.

Claim 17 (Previously Presented)

Claim 18 (Previously Amended) The amendments to previous claim 18 are supported at least at col 7, ln 50 to col 8, ln 16 of U.S. Patent No. 8,236,145.

Claim 19 (Previously Amended) The amendments to previous claim 19 are supported at least at col 6, ln 21-25 of U.S. Patent No. 8,236,145.

Claim 20 (Previously Amended) The amendments to previous claim 20 are supported at least at col 7, ln 1-4 of U.S. Patent No. 8,236,145.

Claim 21 (Previously Canceled)

Claim 22 (Previously Amended) The amendments to previous claim 22 are supported at least at col 7, ln 43-45 of U.S. Patent No. 8,236,145.

Claims 23-32 (Previously Canceled)

Claims 33-35 (New) Claims 33-35 are supported at least at col 7, ln 3-4 of U.S. Patent No. 8,236,145.

Claim 36 (New) Claim 36 is supported at least at col 7, ln 38-40 of U.S. Patent No. 8,236,145.

Claim 37 (New) Claim 37 is supported at least at col 6, ln 52-55 and col 7, ln 29-43 of U.S. Patent No. 8,236,145.

Claims 38-39 (New) Claims 38-39 are supported at least at col 6, ln 16-19 of U.S. Patent No. 8,236,145.

Claim 40 (New) Claim 40 is supported at least at col 7, ln 50 to col 8, ln 16 of U.S. Patent No. 8,236,145.

Claim 41 (New) Claim 41 is supported at least at col 7, ln 43-45 of U.S. Patent No. 8,236,145.

Claim 42 (New) Claim 42 is supported at least at col 6, ln 21-25 of U.S. Patent No. 8,236,145.

Claim 43 (New) Claim 43 is supported at least at col 7, ln 43-45 of U.S. Patent No. 8,236,145.

Claim 44 (New) Claim 44 is supported at least at col 1, ln 34-45 of U.S. Patent No. 8,236,145.

Claim 45 (New) Claim 45 is supported at least at col 7, ln 38-40 of U.S. Patent No. 8,236,145.

Claims 46-48 (New) Claims 46-48 are supported at least at col 7, ln 3-4 of U.S. Patent No. 8,236,145.

Claim 49 (New) Claim 49 is supported at least at col 6, ln 52-55, col 6, ln 16-19, and col 7, ln 29-43 of U.S. Patent No. 8,236,145.

Claims 50-52 (New) Claims 50-52 are supported at least at col 6, ln 16-19 of U.S. Patent No. 8,236,145.

Claim 53 (New) Claim 53 is supported at least at col 6, ln 21-25 of U.S. Patent No. 8,236,145.

Claim 54 (New) Claim 54 is supported at least at col 7, ln 43-45 of U.S. Patent No. 8,236,145.

Claim 55 (New) Claim 55 is supported at least at col 6, ln 52-55 of U.S. Patent No. 8,236,145.

Claim 56 (New) Claim 56 is supported at least at col 7, ln 50 to col 8, ln 16 of U.S. Patent No. 8,236,145.

Claims 57-59 (New) Claims 57-59 are supported at least at col 7, ln 3-4 of U.S. Patent No. 8,236,145.

The Office is respectfully requested to enter the claim amendments submitted herein and to withdraw the objection to the claims.

Rejections under 35 U.S.C. § 112

Claims 36 and 45 were rejected under pre-AIA 35 U.S.C. §112, first paragraph for failing to comply with the written description requirement. The Office asserts that there is no support for "a second sacrificial anode assembly" or "a second sacrificial anode" as recited in claims 36 and 45, respectively. Disagreement is respectfully submitted.

The '145 Patent discloses and provides support for the claimed "second sacrificial anode assembly" and "second sacrificial anode." For example, the '145 Patent discloses, referring to Figure 4A, that "[t]he device 12 may be attached to the interior of the radiator 11 **at any of a variety of locations 44** in the vicinity of the inlet 17." Col. 7, ln. 38-40 (emphasis added). Figure 4A, accordingly, depicts a plurality of locations 44 for attaching the device. In addition to that disclosure in the '145 patent, the Federal Circuit has repeatedly stated that, absent a clear intent to limit to the singular, otherwise singular articles, e.g., "a," "an," "the," or "said," are construed as meaning "one or more." *See, e.g., Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342-43 (Fed. Cir. 2008). Here, as a result, the disclosure should be understood to include more than one assembly or anode, especially in view of Figure 4A depicting a plurality of locations for attaching the assembly and anode.

Accordingly, claims 36 and 45 comply with Section 112, first paragraph, and reconsideration and withdrawal of the rejections under Section 112 are respectfully requested.

Rejections Under 35 U.S.C. § 103

I. The Pending Claims Are Patentable Over *Guo*

Claims 12, 16-20, 33-42, 44-53, and 55-59 were rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Chinese Patent Application No. 1225998 to Guo Zhangeng ("*Guo*"). As explained below, those claims are not obvious in view of *Guo*.

A. Independent Claims 12, 37, and 49 and their Respective Dependent Claims

Independent claims 12, 37, and 49, and their respective dependent claims, are patentable over *Guo,* because the *Guo* does not teach or suggest each of the features recited in those claims. Each of those claims require a sacrificial anode placed "within 10 inches of a hot liquid inlet" to the radiator. In particular, the claims recite, with added emphasis:

> 12. A method of preventing corrosion of a radiator, the method comprising:
>
> installing a sacrificial anode assembly including a sacrificial anode within the radiator, **wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator**.
>
> 37. A radiator for use in a motor vehicle, the radiator further comprising:
>
> a hot liquid inlet to the radiator from an engine of the motor vehicle, the hot liquid inlet providing fluid communication for fluid flow of hot liquid from the engine; and,
>
> **a sacrificial anode installed within 10 inches of the hot liquid inlet of the radiator**.
>
> 49. An electrolysis prevention device for preventing corrosion, the electrolysis prevention device comprising:
>
> a sacrificial anode made of an active metal; and
>
> an anode holder supporting the sacrificial anode, the anode holder adapted for installation in an engine radiator **within 10 inches of a hot liquid inlet to the engine radiator**.

Guo does not teach or suggest that a sacrificial anode is placed "within 10 inches of a hot liquid inlet" as recited in independent claims 12, 37, and 49. Indeed, in explaining the rejection over *Guo*, the Office admits that "Gou [sic] does not teach that the anode is within 10 inches of a hot liquid inlet to the radiator." Office Action at 6.

The Office asserts that it nonetheless would have been obvious "to locate the anode of Gou [sic] within 10 inches of the radiator inlet because the ideal location would have depended on the

actual size of the radiator and the Gou [sic] anode would not have performed differently from the claimed anode." Office Action at 6. Disagreement is respectfully submitted.

The statements by the Office regarding *Guo* are improper and cannot support an obviousness rejection under Section 103, because they are not supported by any evidence and appear to be the subjective opinion of the Examiner. For example, the Office does not explain how the "ideal location" would have been evaluated, i.e., by what measure. Nor does the Office explain how any such "ideal location" would have been determined from the "actual size of the radiator," in view of the disclosure of *Guo*. The Office also fails to explain how any such "ideal location" derived from *Guo* would be "within 10 inches of a hot liquid inlet" as recited by independent claims 12, 37, and 49.

Furthermore, even if the Office's vague arguments could be credited, they are misplaced because *Guo* is directed to "heating equipment" of the type typically installed for indoor heating. *Guo* (translation) at 3. For example, *Guo* describes the radiators there as "leaking . . . about 80 tons of water a day" and that "water leakage can damage the furniture." *Id.* Therefore, the assertion by the Office that "the ideal location would have depended on the actual size of the radiator and the Gou anode would not have performed differently from the claimed anode" is also factually incorrect.

For at least these reasons, *Guo* does not teach or suggest that the sacrificial anode is placed "within 10 inches of a hot liquid inlet" to the radiator as recited in independent claims 12, 37, and 49. If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending from it is also nonobvious. *In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *see also* MPEP 2143.03. Claims 16-20, 22, and 33-36 depend from claim 12. Claims 38-48 depend from claim 37. Claims 50-59 depend from claim 49. The Office has failed to present a *prima facie* case of obviousness against independent claims 12, 37, and 49, and accordingly, those claims, along with their respective dependent claims, are patentable over *Guo*.

B. Claims 19 and 42

Claims 19 and 42 are also patentable over *Guo* for an additional reason. Regarding claims 19 and 42, the Office asserts that "the Gou anode being mounted in a hole in a radiator made of steel would necessarily make the anode grounded to a motor vehicle using said radiator for heat exchange." Office Action at 7. Disagreement is respectfully submitted. As noted above, there is

simply no teaching or suggestion in *Guo* of a motor vehicle using a radiator and the assertion by the Office is in error.

C. Claims 33-35, 46-48, and 57-59

Claims 33-35, 46-48, and 57-59 are also patentable over *Guo* for an additional reason. These claims further require the "hot liquid" to be "coolant," "water," or "antifreeze." The Office asserts, regarding those claims, that "Gou teaches that the hot liquid is water. Official notice is taken that coolant and antifreeze are equivalent to water in the art of radiator cooling." Office Action at 7, 8. Disagreement is respectfully submitted. As explained above, contrary to the assertion by the Office, *Guo* is directed to heating equipment for indoor spaces, which is substantially different, including in the use of the type of liquid used in the system. It is respectfully submitted that *Guo* does not teach or suggest that coolant and antifreeze are equivalent to water.

D. Claims 36 and 45

Claims 36 and 45 are also patentable over *Guo* for an additional reason. As explained above with respect to the Office's Section 112 rejection, claims 36 and 45 are supported by the '145 patent. The Office admits that *Guo* "does not teach a second sacrificial anode." Office Action at 7. Therefore, claims 36 and 45 are patentable over *Guo*.

E. Claim 44

Claim 44 is also patentable over *Guo* for an additional reason. Claim 44 is directed to a radiator that "enables air-cooling of the hot liquid." The Office has asserted that "Gou teaches that its anode prevented corrosion inside of the radiator, thus preserving its effectiveness as a radiator for air-cooling hot liquid." Office Action at 7. Disagreement is respectfully submitted. As explained above, *Guo* does not teach or suggest "a radiator for air-cooling hot liquid" but instead, is directed to "heating equipment" that is substantially different.

II. Claims 22, 43, and 54 Are Patentable Over *Guo* and *Green*

Dependent claims 22, 43, and 54 were rejected under pre-AIA 35 U.S.C. §103(a) as being unpatentable over *Guo* in view of U.S. Patent No. 5,649,591 to Green ("*Green*"). Those claims depend from independent claims 12, 37, and 49 respectively. As explained above, claims 12, 37, and 49 are patentable over *Guo* because *Guo* does not teach or suggest a sacrificial anode placed "within 10 inches of a hot liquid inlet" to the radiator. The Office does not rely on *Green* to teach or suggest that element of the claims. The Office has therefore failed to present a *prima facie* case

of obviousness against dependent claims 22, 43, and 54, and accordingly, those claims are patentable over the combination of Guo and Green. *See In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious); *see also* MPEP 2143.03.

III. Claims 12, 20 and 33-36 Are Patentable over *Gush*

Claim 12, and its dependent claims 20 and 33-36 were rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 1,514,903 to Gush ("*Gush*"). Those claims are not obvious in view of *Gush*, because *Gush* does not teach or suggest each of the features recited in the claims. As explained above, claim 12 requires a sacrificial anode, "wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator." *Gush* does not teach or suggest a sacrificial anode "placed within 10 inches of a hot liquid inlet to the radiator." The Office admits that Gush "does not explicitly teach that the anticorrosion electrodes are within 10 inches of a hot liquid inlet to the radiator." Office Action at 9.

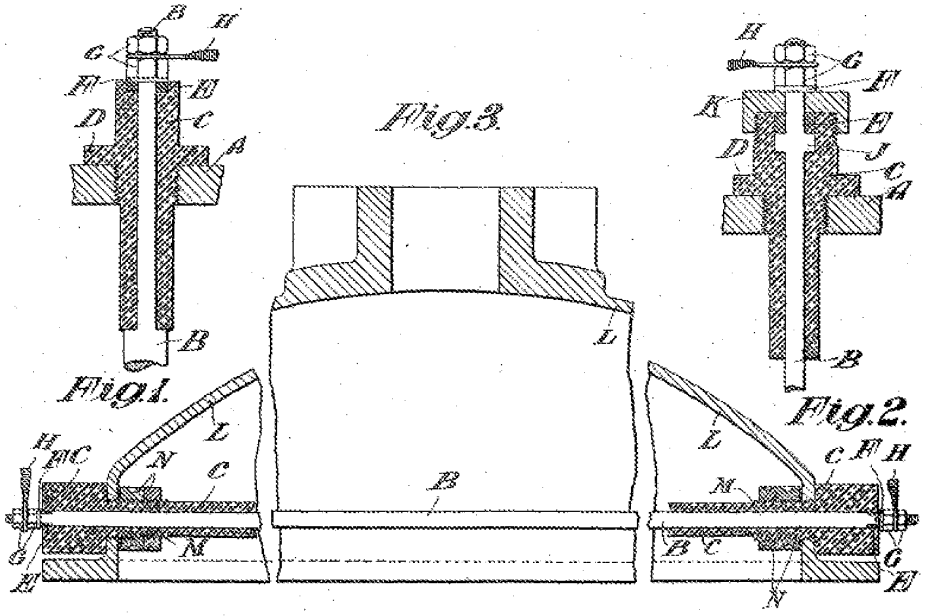
Despite conceding that *Gush* does not explicitly disclose a sacrificial anode placed within 10 inches of a hot liquid inlet to the radiator, the Office asserts that it nonetheless would have been obvious "to locate the anode of Gush within 10 inches of the radiator inlet because the ideal location would have depended on the actual size of the radiator and the Gush anode would not have performed differently from the claimed anode." Office Action at 9. Disagreement is respectfully submitted.

The statements by the Office regarding *Gush* are improper and cannot support an obviousness rejection under Section 103, because they are not supported by any evidence and appear to be the subjective opinion of the Examiner. For example, the Office does not explain how the "ideal location" would have been evaluated, i.e., by what measure. Nor does the Office explain how any such "ideal location" would have been determined from the "actual size of the radiator," in view of the disclosure of *Gush*. The Office also fails to explain how any such "ideal location" derived from *Gush* would be "within 10 inches of a hot liquid inlet" as recited by independent claims 12.

Furthermore, even if the Office's vague arguments could be credited, they appear to be premised on an unfounded reading of the disclosure of *Gush*. The Office appears to assert that the electrode "B" in Figure 3 or the electrode "P" in Figure 5 are located near a hot liquid inlet to the radiator or cooling water manifold, and then reasons from there that one of skill in the art could

determine an "ideal location" for the anode that would render obvious positioning a sacrificial anode "within 10 inches of the a hot liquid inlet to the radiator" as claimed. Office Action at 9. For example, the Office cited *Gush* as allegedly disclosing "[t]he top ('L') of a downflow radiator or the cooling water manifold ('O') through which hot water was known to flow from an engine into a radiator." Office Action at 9. Disagreement is respectfully submitted.

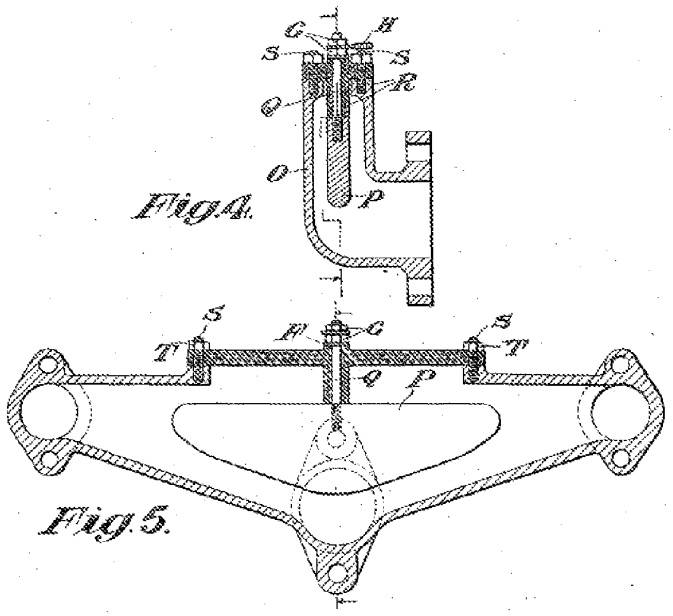
Gush does not teach, for either the radiator "L" or the cooling water manifold "O," the location of "a hot liquid inlet to the radiator" as recited in claim 12. Indeed, the description in *Gush* does not even mention a "hot liquid inlet," much less identify where such an inlet would be in the figures relied on by the Office in making its obviousness rejection. Figure 3 in *Gush*, copied below for reference, shows "a longitudinal section through the upper portion of the radiator of a motor vehicle." *Gush* at 1, ln 80-83. Figure 3 shows "the top of a radiator L." *Id.* at 2, ln 13-14. But *Gush* does not describe Figure 3 as disclosing a "hot liquid inlet."



At the time of the invention of *Gush*, it was well known that a filling opening for the radiator was typically located at the top center of the radiator at the time of the invention of *Gush*, and the location of this radiator cap was also used as a central front ornament of the vehicle. For this reason, it is respectfully submitted that the upper central opening in the radiator "L" shown in Figure 3 of *Gush* is a filling opening for the radiator and not a hot liquid inlet to the radiator. Therefore, the apparent assertion by the Office that the top opening in Figure 3 of *Gush* is one

"through which hot water was known to flow from an engine into a radiator" is in error and is not supported by the disclosure of *Gush*.

The Office's assertions with respect to the cooling water manifold of Figures 4 and 5 are similarly misplaced. To begin with, the Office appears to use the terms "radiator" and "cooling water manifold" as equivalent elements, which is in error. Contrary to the assertion by the Office, a cooling water manifold, as disclosed by *Gush*, is not a "radiator" as claimed and is not a heat exchange device. Furthermore, there is no description or disclosure in *Gush* of "a hot liquid inlet to the radiator" in connection with the cooling water manifold of Figures 4 and 5, copied below for reference.



For at least these reasons, *Gush* does not teach or suggest "a hot liquid inlet to the radiator," as recited in claim 12. If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending from it is also nonobvious. *In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *see also* MPEP 2143.03. Claims 20 and 33-36 depend from claim 12. The Office has failed to present a *prima facie* case of obviousness against claim 12. Accordingly, claim 12, along with its dependent claims 20 and 33-36 are patentable over *Gush*.

CONCLUSION

It is believed that this is a full and complete response to all matters raised in the Office Action. Reconsideration and early allowance of all pending claims are respectfully requested.

Should the Examiner have any questions or consider a telephone call helpful, please feel free to contact the undersigned.

Respectfully submitted,

/Stephen C. Stout/

Stephen C. Stout
Reg. No. 61,326
Attorney for Applicant

Vinson & Elkins L.L.P.
1001 Fannin Street, Suite 2500
Houston, TX 77002-6760
512.542.8929
Date: August 31, 2018

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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000	7313

21586 7590 09/11/2018

VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

EXAMINER	
VINCENT, SEAN E	

ART UNIT	PAPER NUMBER
3991	

NOTIFICATION DATE	DELIVERY MODE
09/11/2018	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):

IPTLdocket@velaw.com
ggoel@velaw.com
sbrown@velaw.com

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 14/452,339	**Applicant(s)** Petrosino, Frank	
	Examiner SEAN E VINCENT	**Art Unit** 3991	**AIA Status** No

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

THE REPLY FILED 31 August 2018 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☑ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:
   a) ☑ The period for reply expires 3 months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection.The current period for reply expires ____ months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.
   Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANTS FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37CFR 41.37(a).

AMENDMENTS

3. ☑ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☑ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☑ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: See explanation below (See 37CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicants reply has overcome the following rejection(s): _____
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☑ For purposes of appeal, the proposed amendment(s):(a) ☑ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____
9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____.
13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
14. ☐ Other: _____.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:
    Claim(s) allowed:1-11 and 13-14.
    Claim(s) objected to:_____.
    Claim(s) rejected:12,16-20,22 and 33-59.
    Claim(s) withdrawn from consideration:_____.

/Sean E Vincent/ Patent Reexam Specialist, Art Unit 3991	

The amendment filed August 31,2018 proposes the addition of NEW claims 16-20 and 22 that do not comply with 37 CFR 1.173(b), which sets forth the manner of making amendments in reissue applications. NEW claims are claims that were not present in the patent to be reissued. NEW claims must be underlined.

The same amendment proposes amendments to original claim 12 but lacks the proper markings.

Patent Owner is reminded of the treatment of the December 29, 2015 amendment described on pages 3 and 4 of the Final Rejection mailed February 24, 2016 and the subsequent warnings provided in office actions mailed August 25, 2016 and July 23, 2018. A close review of MPEP 1453 is suggested.

Further consideration or search is required to review arguments concerning what, if any, differences exist between radiators for heating and radiators for cooling (remarks, page 11) as they pertain to amended claim 12 in view of Gou.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Frank Petrosino	Art Unit:	3991
Application No.:	14/452,339	Confirmation No.	7313
Filing Date:	08/05/2014	Examiner:	Vincent, Sean E.
		Atty. Docket:	PET744/4-001REUS/58000
Title:	ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE		

RESPONSE TO FINAL OFFICE ACTION

VIA EFS WEB

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

Sir:

Applicant respectfully submits this Response to the Final Office Action dated July 23, 2018 (herein "Office Action") and requests favorable action thereon.

This Response is submitted within the two month period. It is believed that no fees are due in connection with this Response; for any fees required in connection with the present communication, the Commissioner is authorized to deduct any such fees from Vinson & Elkins L.L.P. Deposit Account No. 220365/PET744/4-001REUS/58000.

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To: IPTLdocket@velaw.com,sbrown@velaw.com,ggoel@velaw.com
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 21586

Sep 11, 2018 03:40:08 AM

Dear PAIR Customer:

VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 21586 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14452339	CTAV	09/11/2018	PET744/4-001REUS/58000

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

UNITED STATES PATENT AND TRADEMARK OFFICE

USPTO Automated Interview Request (AIR)

Sep 12 2018

This paper requesting to schedule and/or conduct an interview is appropriate because:

This submission is requested to be accepted as an authorization for this interview to communicate via the internet. Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned concerning scheduling of the interview via video conference, instant messaging, or electronic mail, and to conduct the interview in accordance with office practice including video conferencing.

Name(s):
GAURAV GOEL

S-signature:
/GAURAV GOEL/

Registration Number:
56804

U.S. Application Number:
14452339

Confirmation Number:
7313

E-mail Address:
ggoel@velaw.com

Phone Number:
5125428456

Proposed Time of Interview:
9-19-2018 2:00 PM ET

Alternative Proposed Time(s) of Interview:
9-19-2018 3:00 PM ET

Alternative Proposed Time(s) of Interview:
9-19-2018 4:00 PM ET

Prefered Interview Type:
Telephonic

I am the applicant or applicant's representative for this application.

Topic for Discussion:
Discussion of the teachings of Guo and Gush as argued in the recently filed response.

UNITED STATES
PATENT AND TRADEMARK OFFICE

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/452,339	Filing Date 08/05/2014	☐ To be Mailed

ENTITY: ☐ LARGE ☐ SMALL ☒ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	08/31/2018	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 47	Minus	** 47	= 0	X $25 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	***5	= 0	X $115 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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.

LIE
TYWANA LOVELACE

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.

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	14452339	Filing Date	2014-08-05	Docket Number (if applicable)	PET744/4-001REUS	Art Unit	3991
First Named Inventor	Frank Petrosino			Examiner Name	Sean E. Vincent		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on .....
- ☐ Other .....

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other .....

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months ..... (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other .....

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 220365

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

Signature of Registered U.S. Patent Practitioner			
Signature	/Gaurav Goel/	Date (YYYY-MM-DD)	2018-10-04
Name	Gaurav Goel	Registration Number	56604

This collection of information is required by 37 CFR 1.114. 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.

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

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 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 (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 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.

Electronic Patent Application Fee Transmittal	
Application Number:	14452339
Filing Date:	05-Aug-2014
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Filer:	Gaurav Goel
Attorney Docket Number:	PET744/4-001REUS/58000
Filed as Micro Entity	
Filing Fees for Utility under 35 USC 111(a)	

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($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	3820	1	475	475
		Total in USD ($)		**475**

Electronic Acknowledgement Receipt	
EFS ID:	33923852
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Gaurav Goel
Filer Authorized By:	
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	04-OCT-2018
Filing Date:	05-AUG-2014
Time Stamp:	18:15:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$475
RAM confirmation Number	100518INTEFSW00005028220365
Deposit Account	220365
Authorized User	Yvonne Shumaker
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 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	Request for Continued Examination (RCE)	20181004RCE.pdf	1532309 2a88d3a6d10ef0d97b1bcbc0aefd2cd846f8693b	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Amendment Submitted/Entered with Filing of CPA/RCE	20181004ResponseFOA.pdf	534205 c770ae49b744ae38b82b71e6f95e2e106d25169e	no	16
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30211 4493d56faff00eb4a4adfbda8d54a6b5768e8610	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2096725		

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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Frank Petrosino	Art Unit:	3991
Application No.:	14/452,339	Confirmation No.	7313
Filing Date:	08/05/2014	Examiner:	Vincent, Sean E.
		Atty. Docket:	PET744/4-001REUS/58000
Title:	ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE		

RESPONSE TO FINAL OFFICE ACTION MAILED JULY 23, 2018
FILED WITH A REQUEST FOR CONTINUED EXAMINATION (RCE)

VIA EFS WEB

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

Sir:

This paper is a complete response to the Final Office Action mailed on July 23, 2018 and in response to an Advisory Action mailed September 11, 2018. This paper is also filed with a Request for Continued Examination (RCE). Filed herewith is authorization to charge the requisite fees of $475.00 [Fee Code 3820]. It is believed that no further fees are due. For any additional fees required in connection with the present communication, the Commissioner is authorized to deduct any such fees from the Vinson & Elkins LLP Deposit Account No. 22-0365, Attn: PET744/4-001REUS/58000.

A listing of all claims is on pages 2 through 6.

Remarks are on pages 7 through 9.

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CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. (Original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of aluminum.

3. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of magnesium.

4. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of zinc.

5. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is grounded to a vehicle.

6. (Original) The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. (Original) The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. (Original) The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. (Original) The electrolysis prevention device of claim 1 wherein the wherein the engine heat exchange component is a heater core.

10. (Original) A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. (Original) A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. (**Amended**) A method of preventing corrosion of **a radiator [an engine heat exchange component], the method** comprising**: [adding or]** installing a sacrificial anode assembly **including a sacrificial anode** within the **radiator [an engine heat exchange component adjacent an inlet thereof], wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator**.

13. (Original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. (Original) An engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

15. (New) The method of claim 12, wherein said sacrificial anode consists essentially of an active metal.

16. (New) The method of claim 15, wherein said sacrificial anode consists essentially of aluminum, magnesium, or zinc.

17. (New) The method of claim 12, wherein installing the sacrificial anode assembly further comprises: installing the sacrificial anode assembly in a fitting hole in the radiator.

18. (New) The method of claim 12, wherein said sacrificial anode is grounded.

19. (New) The method of claim 12, wherein installing the sacrificial anode assembly further comprises: installing the sacrificial anode assembly within the fluid flow of the radiator.

20. (New) The method of claim 12, wherein the radiator comprises aluminum.

21. (New) The method of claim 12, wherein the hot liquid is coolant.

22. (New) The method of claim 12, wherein the hot liquid is water.

23. (New) The method of claim 12, wherein the hot liquid is antifreeze.

24. (New) The method of claim 12, further comprising installing a second sacrificial anode assembly within the radiator.

25. (New) A radiator for use in a motor vehicle, the radiator further comprising:

a hot liquid inlet to the radiator from an engine of the motor vehicle, the hot liquid inlet providing fluid communication for fluid flow of hot liquid from the engine; and

a sacrificial anode installed within 10 inches of the hot liquid inlet of the radiator.

26. (New) The radiator of claim 25, wherein the sacrificial anode consists essentially of an active metal.

27. (New) The radiator of claim 26, wherein the active metal is at least one of aluminum, magnesium, and zinc.

28. (New) The radiator of claim 25 wherein the sacrificial anode is installed in a fitting hole penetrating the radiator.

29. (New) The radiator of claim 25 wherein the sacrificial anode is installed onto a surface of the radiator.

30. (New) The radiator of claim 25 wherein the sacrificial anode is grounded to the motor vehicle.

31. (New) The radiator of claim 25 wherein the radiator comprises aluminum.

32. (New) The radiator of claim 25 wherein the radiator enables air-cooling of the hot liquid.

33. (New) The radiator of claim 25, further comprising a second sacrificial anode.

34. (New) The radiator of claim 25, wherein the hot liquid is coolant.

35. (New) The radiator of claim 25, wherein the hot liquid is water.

36. (New) The radiator of claim 25, wherein the hot liquid is antifreeze.

37. (New) An electrolysis prevention device for preventing corrosion, the electrolysis prevention device comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode, the anode holder adapted for installation in an engine radiator within 10 inches of a hot liquid inlet to the engine radiator.

38. (New) The electrolysis prevention device of claim 37, wherein the sacrificial anode comprises aluminum.

39. (New) The electrolysis prevention device of claim 37, wherein the sacrificial anode comprises magnesium.

40. (New) The electrolysis prevention device of claim 37, wherein the sacrificial anode comprises zinc.

41. (New) The electrolysis prevention device of claim 37, wherein the engine radiator is used in a motor vehicle, and wherein the sacrificial anode is grounded to the motor vehicle.

42. (New) The electrolysis prevention device of claim 37, wherein the engine radiator comprises aluminum.

43. (New) The electrolysis prevention device of claim 37, wherein the anode holder enables the sacrificial anode to be located within fluid flow of the hot coolant inlet.

44. (New) The electrolysis prevention device of claim 37, wherein the anode holder is installed in a fitting hole penetrating the engine radiator.

45. (New) The electrolysis prevention device of claim 37, wherein the hot liquid is coolant.

46. (New) The electrolysis prevention device of claim 37, wherein the hot liquid is water.

47. (New) The electrolysis prevention device of claim 37, wherein the hot liquid is antifreeze.

REMARKS

At the time of the Office Action electronically sent on July 23, 2018, claims 1-14, 16-20, 22, and 33-59 were pending in the Reissue Application. The claims have been corrected for reissue numbering and amendment practice according to 37 C.F.R. 1.173. Accordingly, claim 12 is amended, and claims 15-47 are new claims in the Reissue Application. The previously issued patent, U.S. Pat. No. 8,236,145, is referred to throughout these Remarks as the "'145 Patent."

Objection to the Claims

The claims were objected to for improper claim format in a Reissue Application according to 37 C.F.R. § 1.173. The status and explanation of support for the previously amended claims is provided below.

Claims 1-11 (Original)

Claim 12 (Amended) The amendments to previous claim 12 are supported at least at col 7, ln 29-43 of U.S. Patent No. 8,236,145.

Claims 13-14 (Original)

Claim 15 (New) Claim 15 is supported at least at col 6, ln 16-19 the '145 patent.

Claim 16 (New) Claim 16 is supported at least at col 6, ln 16-19 the '145 patent.

Claim 17 (New) Claim 17 is supported at least at col 7, ln 50 to col 8, ln 16 of the '145 patent.

Claim 18 (New) Claim 18 is supported at least at col 6, ln 21-25 of the '145 patent.

Claim 19 (New) claim 19 is supported at least at col 7, ln 1-4 of the '145 patent.

Claim 20 (New) Claim 20 is supported at least at col 7, ln 43-45 of the '145 patent.

Claims 21-23 (New) Claims 21-23 are supported at least at col 7, ln 3-4 of the '145 patent.

Claim 24 (New) Claim 24 is supported at least at col 7, ln 38-40 of of the '145 patent.

Claim 25 (New) Claim 25 is supported at least at col 6, ln 52-55 and col 7, ln 29-43 of the '145 patent.

Claims 26-27 (New) Claims 26-27 are supported at least at col 6, ln 16-19 of the '145 patent.

Claim 28 (New) Claim 28 is supported at least at col 7, ln 50 to col 8, ln 16 of the '145 patent.

Claim 29 (New) Claim 29 is supported at least at col 7, ln 43-45 of the '145 patent.

Claim 30 (New) Claim 30 is supported at least at col 6, ln 21-25 of the '145 patent.

Claim 31 (New) Claim 31 is supported at least at col 7, ln 43-45 of the '145 patent.

Claim 32 (New) Claim 32 is supported at least at col 1, ln 34-45 of the '145 patent.

Claim 33 (New) Claim 33 is supported at least at col 7, ln 38-40 of the '145 patent.

Claims 34-36 (New) Claims 34-36 are supported at least at col 7, ln 3-4 of the '145 patent.

Claim 37 (New) Claim 37 is supported at least at col 6, ln 52-55, col 6, ln 16-19, and col 7, ln 29-43 of the '145 patent.

Claims 38-40 (New) Claims 38-40 are supported at least at col 6, ln 16-19 of the '145 patent.

Claim 41 (New) Claim 41 is supported at least at col 6, ln 21-25 of the '145 patent.

Claim 42 (New) Claim 42 is supported at least at col 7, ln 43-45 of the '145 patent.

Claim 43 (New) Claim 43 is supported at least at col 6, ln 52-55 of the '145 patent.

Claim 44 (New) Claim 44 is supported at least at col 7, ln 50 to col 8, ln 16 of the '145 patent.

Claims 45-47 (New) Claims 45-47 are supported at least at col 7, ln 3-4 of the '145 patent.

The Office is respectfully requested to enter the claim amendments submitted herein and to withdraw the objection to the claims.

Rejections under 35 U.S.C. § 112

Claims 36 and 45 were rejected under pre-AIA 35 U.S.C. §112, first paragraph for failing to comply with the written description requirement. The Office asserts that there is no support for "a second sacrificial anode assembly" or "a second sacrificial anode" as now recited in claims 24 and 33, respectively. Disagreement is respectfully submitted.

The '145 Patent discloses and provides support for the claimed "second sacrificial anode assembly" and "second sacrificial anode." For example, the '145 Patent discloses, referring to Figure 4A, that "[t]he device 12 may be attached to the interior of the radiator 11 **at any of a variety of locations 44** in the vicinity of the inlet 17." Col. 7, ln. 38-40 (emphasis added). Figure 4A, accordingly, depicts a plurality of locations 44 for attaching the device. In addition to that disclosure in the '145 patent, the Federal Circuit has repeatedly stated that, absent a clear intent to limit to the singular, otherwise singular articles, e.g., "a," "an," "the," or "said," are construed as

meaning "one or more." *See, e.g., Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342-43 (Fed. Cir. 2008). Here, as a result, the disclosure should be understood to include more than one assembly or anode, especially in view of Figure 4A depicting a plurality of locations for attaching the assembly and anode.

Accordingly, claims 24 and 33 comply with Section 112, first paragraph, and reconsideration and withdrawal of the rejections under Section 112 are respectfully requested.

Rejections Under 35 U.S.C. § 103

I. The Pending Claims Are Patentable Over *Guo*

Claims 12, 16-20, 33-42, 44-53, and 55-59 were rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Chinese Patent Application No. 1225998 to Guo Zhangeng ("*Guo*"). As explained below, those claims are not obvious in view of *Guo*.

A. Independent Claims 12, 37, and 49 as rejected and their Respective Dependent Claims (now Claims 12, 25, and 37)

Independent claims 12, 25, and 37, and their respective dependent claims, are patentable over *Guo,* because the *Guo* does not teach or suggest each of the features recited in those claims. Each of those claims require a sacrificial anode placed "within 10 inches of a hot liquid inlet" to the radiator. In particular, the claims recite, with added emphasis:

> 12. A method of preventing corrosion of a radiator, the method comprising:
>
> installing a sacrificial anode assembly including a sacrificial anode within the radiator, **wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator**.
>
> 25. A radiator for use in a motor vehicle, the radiator further comprising:
>
> a hot liquid inlet to the radiator from an engine of the motor vehicle, the hot liquid inlet providing fluid communication for fluid flow of hot liquid from the engine; and,
>
> **a sacrificial anode installed within 10 inches of the hot liquid inlet of the radiator**.
>
> 37. An electrolysis prevention device for preventing corrosion, the electrolysis prevention device comprising:
>
> a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode, the anode holder adapted for installation in an engine radiator **within 10 inches of a hot liquid inlet to the engine radiator**.

Guo does not teach or suggest that a sacrificial anode is placed "within 10 inches of a hot liquid inlet" as recited in independent claims 12, 37, and 49. Indeed, in explaining the rejection over *Guo*, the Office admits that "Gou [sic] does not teach that the anode is within 10 inches of a hot liquid inlet to the radiator." Office Action at 6.

The Office asserts that it nonetheless would have been obvious "to locate the anode of Gou [sic] within 10 inches of the radiator inlet because the ideal location would have depended on the actual size of the radiator and the Gou [sic] anode would not have performed differently from the claimed anode." Office Action at 6. Disagreement is respectfully submitted.

The statements by the Office regarding *Guo* are improper and cannot support an obviousness rejection under Section 103, because they are not supported by any evidence and appear to be the subjective opinion of the Examiner. For example, the Office does not explain how the "ideal location" would have been evaluated, i.e., by what measure. Nor does the Office explain how any such "ideal location" would have been determined from the "actual size of the radiator," in view of the disclosure of *Guo*. The Office also fails to explain how any such "ideal location" derived from *Guo* would be "within 10 inches of a hot liquid inlet" as recited by independent claims 12, 25, and 37.

Furthermore, even if the Office's vague arguments could be credited, they are misplaced because *Guo* is directed to "heating equipment" of the type typically installed for indoor heating. *Guo* (translation) at 3. For example, *Guo* describes the radiators there as "leaking . . . about 80 tons of water a day" and that "water leakage can damage the furniture." *Id.* Therefore, the assertion by the Office that "the ideal location would have depended on the actual size of the radiator and the Gou anode would not have performed differently from the claimed anode" is also factually incorrect.

For at least these reasons, *Guo* does not teach or suggest that the sacrificial anode is placed "within 10 inches of a hot liquid inlet" to the radiator as recited in independent claims 12, 25, and 37. If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending from it is also nonobvious. *In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *see also* MPEP 2143.03. Claims 16-20, 22, and 33-36 depend from claim 12. Claims 26-36 depend from claim 25. Claims 38-47 depend from claim 37. The Office has failed to present a *prima facie* case of

obviousness against independent claims 12, 25, and 37, and accordingly, those claims, along with their respective dependent claims, are patentable over *Guo*.

B. Claims 19 and 42 as rejected (now Claims 18 and 30)

Claims 18 and 30 are also patentable over *Guo* for an additional reason. Regarding claims 18 and 30, the Office asserts that "the Gou anode being mounted in a hole in a radiator made of steel would necessarily make the anode grounded to a motor vehicle using said radiator for heat exchange." Office Action at 7. Disagreement is respectfully submitted. As noted above, there is simply no teaching or suggestion in *Guo* of a motor vehicle using a radiator and the assertion by the Office is in error.

C. Claims 33-35, 46-48, and 57-59 as rejected (now Claims 21-23, 34-36, and 45-47)

Claims 21-23, 34-36, and 45-47 are also patentable over *Guo* for an additional reason. These claims further require the "hot liquid" to be "coolant," "water," or "antifreeze." The Office asserts, regarding those claims, that "Gou teaches that the hot liquid is water. Official notice is taken that coolant and antifreeze are equivalent to water in the art of radiator cooling." Office Action at 7, 8. Disagreement is respectfully submitted. As explained above, contrary to the assertion by the Office, *Guo* is directed to heating equipment for indoor spaces, which is substantially different, including in the use of the type of liquid used in the system. It is respectfully submitted that *Guo* does not teach or suggest that coolant and antifreeze are equivalent to water.

D. Claims 36 and 45 as rejected (now Claims 24 and 33)

Claims 24 and 33 are also patentable over *Guo* for an additional reason. As explained above with respect to the Office's Section 112 rejection, claims 36 and 45 are supported by the '145 patent. The Office admits that *Guo* "does not teach a second sacrificial anode." Office Action at 7. Therefore, claims 36 and 45 are patentable over *Guo*.

E. Claim 44 as rejected (now Claim 32)

Claim 32 is also patentable over *Guo* for an additional reason. Claim 32 is directed to a radiator that "enables air-cooling of the hot liquid." The Office has asserted that "Gou teaches that its anode prevented corrosion inside of the radiator, thus preserving its effectiveness as a radiator for air-cooling hot liquid." Office Action at 7. Disagreement is respectfully submitted. As explained above, *Guo* does not teach or suggest "a radiator for air-cooling hot liquid" but instead, is directed to "heating equipment" that is substantially different.

II. Claims 22, 43, and 54 Are Patentable Over *Guo* and *Green* (now Claims 20, 31, and 42)

Dependent claims 20, 31, and 42 were rejected under pre-AIA 35 U.S.C. §103(a) as being unpatentable over *Guo* in view of U.S. Patent No. 5,649,591 to Green ("*Green*"). Those claims depend from independent claims 12, 25, and 37 respectively. As explained above, claims 12, 25, and 37 are patentable over *Guo* because *Guo* does not teach or suggest a sacrificial anode placed "within 10 inches of a hot liquid inlet" to the radiator. The Office does not rely on *Green* to teach or suggest that element of the claims. The Office has therefore failed to present a *prima facie* case of obviousness against dependent claims 20, 31, and 42, and accordingly, those claims are patentable over the combination of Guo and Green. *See In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious); *see also* MPEP 2143.03.

III. Claims 12, 20 and 33-36 Are Patentable over *Gush* (now Claims 12, 19, and 21-23)

Claim 12, and its dependent claims 20 and 33-36 (now claims19 and 21-23) were rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 1,514,903 to Gush ("*Gush*"). Those claims are not obvious in view of *Gush*, because *Gush* does not teach or suggest each of the features recited in the claims. As explained above, claim 12 requires a sacrificial anode, "wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator." *Gush* does not teach or suggest a sacrificial anode "placed within 10 inches of a hot liquid inlet to the radiator." The Office admits that Gush "does not explicitly teach that the anticorrosion electrodes are within 10 inches of a hot liquid inlet to the radiator." Office Action at 9.

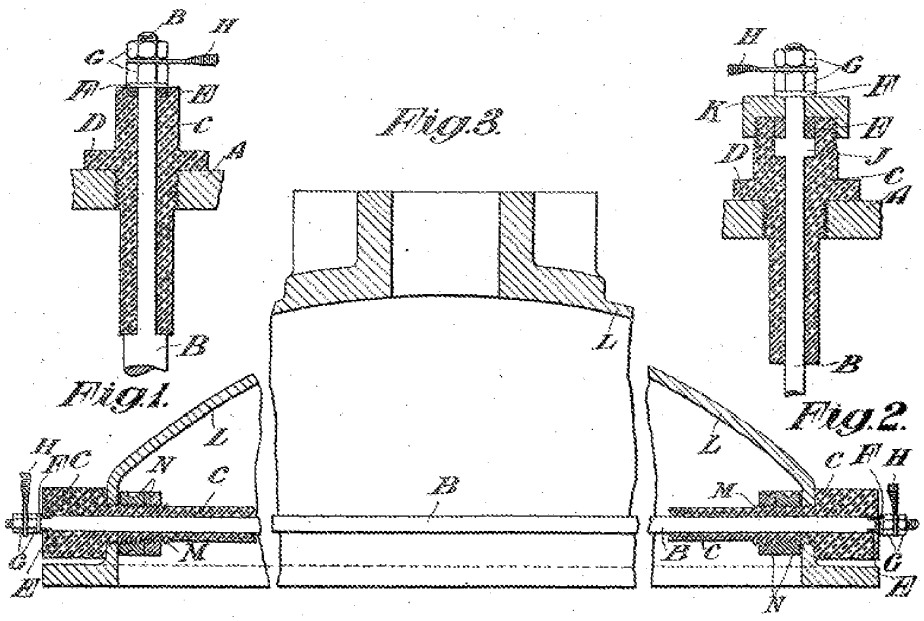
Despite conceding that *Gush* does not explicitly disclose a sacrificial anode placed within 10 inches of a hot liquid inlet to the radiator, the Office asserts that it nonetheless would have been obvious "to locate the anode of Gush within 10 inches of the radiator inlet because the ideal location would have depended on the actual size of the radiator and the Gush anode would not have performed differently from the claimed anode." Office Action at 9. Disagreement is respectfully submitted.

The statements by the Office regarding *Gush* are improper and cannot support an obviousness rejection under Section 103, because they are not supported by any evidence and appear to be the subjective opinion of the Examiner. For example, the Office does not explain how the "ideal location" would have been evaluated, i.e., by what measure. Nor does the Office

explain how any such "ideal location" would have been determined from the "actual size of the radiator," in view of the disclosure of *Gush*. The Office also fails to explain how any such "ideal location" derived from *Gush* would be "within 10 inches of a hot liquid inlet" as recited by independent claim 12.

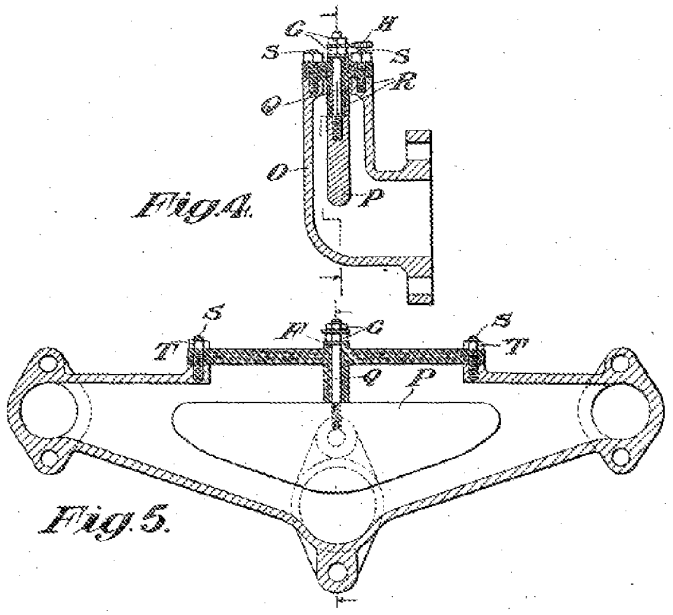
Furthermore, even if the Office's vague arguments could be credited, they appear to be premised on an unfounded reading of the disclosure of *Gush*. The Office appears to assert that the electrode "B" in Figure 3 or the electrode "P" in Figure 5 are located near a hot liquid inlet to the radiator or cooling water manifold, and then reasons from there that one of skill in the art could determine an "ideal location" for the anode that would render obvious positioning a sacrificial anode "within 10 inches of the a hot liquid inlet to the radiator" as claimed. Office Action at 9. For example, the Office cited *Gush* as allegedly disclosing "[t]he top ('L') of a downflow radiator or the cooling water manifold ('O') through which hot water was known to flow from an engine into a radiator." Office Action at 9. Disagreement is respectfully submitted.

Gush does not teach, for either the radiator "L" or the cooling water manifold "O," the location of "a hot liquid inlet to the radiator" as recited in claim 12. Indeed, the description in *Gush* does not even mention a "hot liquid inlet," much less identify where such an inlet would be in the figures relied on by the Office in making its obviousness rejection. Figure 3 in *Gush*, copied below for reference, shows "a longitudinal section through the upper portion of the radiator of a motor vehicle." *Gush* at 1, ln 80-83. Figure 3 shows "the top of a radiator L." *Id.* at 2, ln 13-14. But *Gush* does not describe Figure 3 as disclosing a "hot liquid inlet."



At the time of the invention of *Gush*, it was well known that a filling opening for the radiator was typically located at the top center of the radiator at the time of the invention of *Gush*, and the location of this radiator cap was also used as a central front ornament of the vehicle. For this reason, it is respectfully submitted that the upper central opening in the radiator "L" shown in Figure 3 of *Gush* is a filling opening for the radiator and not a hot liquid inlet to the radiator. Therefore, the apparent assertion by the Office that the top opening in Figure 3 of *Gush* is one "through which hot water was known to flow from an engine into a radiator" is in error and is not supported by the disclosure of *Gush*.

The Office's assertions with respect to the cooling water manifold of Figures 4 and 5 are similarly misplaced. To begin with, the Office appears to use the terms "radiator" and "cooling water manifold" as equivalent elements, which is in error. Contrary to the assertion by the Office, a cooling water manifold, as disclosed by *Gush*, is not a "radiator" as claimed and is not a heat exchange device. Furthermore, there is no description or disclosure in *Gush* of "a hot liquid inlet to the radiator" in connection with the cooling water manifold of Figures 4 and 5, copied below for reference.



For at least these reasons, *Gush* does not teach or suggest "a hot liquid inlet to the radiator," as recited in claim 12. If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending from it is also nonobvious. *In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *see also* MPEP 2143.03. Claims 20 and 33-36 depend from claim 12. The Office has failed to present a *prima facie* case of obviousness against claim 12. Accordingly, claim 12, along with its dependent claims 20 and 33-36 are patentable over *Gush*.

CONCLUSION

It is believed that this is a full and complete response to all matters raised in the Office Action. Reconsideration and early allowance of all pending claims are respectfully requested.

Should the Examiner have any questions or consider a telephone call helpful, please feel free to contact the undersigned.

Respectfully submitted,

/Stephen C. Stout/

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PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/452,339	Filing Date 08/05/2014	☐ To be Mailed

ENTITY: ☐ LARGE ☐ SMALL ☒ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **10/04/2018**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 47	Minus	** 47	= 0	X $25 =	0
Independent (37 CFR 1.16(h))	* 5	Minus	***5	= 0	X $115 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					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.

LIE
RHONDA BELL

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.**
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000	7313

21586 7590 12/10/2018

VINSON & ELKINS, L.L.P.
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1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

EXAMINER	
VINCENT, SEAN E	

ART UNIT	PAPER NUMBER
3991	

NOTIFICATION DATE	DELIVERY MODE
12/10/2018	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):

IPTLdocket@velaw.com
ggoel@velaw.com
sbrown@velaw.com

Office Action Summary	Application No. 14/452,339	Applicant(s) Petrosino, Frank	
	Examiner SEAN E VINCENT	Art Unit 3991	AIA Status No

-- 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 MONTHS 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 10/4/18.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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) 1-47 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) 1-47 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).

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)).

** 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/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

The present application is being examined under the pre-AIA first to invent provisions.

Reissue Applications

For reissue applications filed before September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the law and rules in effect on September 15, 2012. Where specifically designated, these are "pre-AIA" provisions.

For reissue applications filed on or after September 16, 2012, all references to 35 U.S.C. 251 and 37 CFR 1.172, 1.175, and 3.73 are to the current provisions.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 4, 2018 has been entered.

Priority

US Patent 8,236,145 (hereafter referred to as "The '145 Patent") claimed priority to US Provisional application No. 61/120,296 filed on Dec. 5, 2008. The Application Data Sheet submitted December 29, 2015 correctly states the domestic priority claim.

Status of the Claims

Original claims 1-11, 13 and 14 from the '145 Patent are presented.

Original claim 12 is proposed to be amended.

New claims 15-47 are proposed to be added by present reissue.

Reissue Claim Format

The claim amendments submitted 10/04/2018 are in proper format. Applicant is notified that any subsequent amendment to the specification and/or claims must comply with 37 CFR 1.173(b). See MPEP § 1453.

Reissue Declaration

The reissue declaration filed May 24, 2016 is defective (see 37 CFR 1.175 and MPEP § 1414) because of the following:

The error statement includes "…claims dependent on claim 12, specifically claims 15-20, 21 and 32." In the most recent claim amendments, renumbering of the claims has resulted in claim 32 being dependent from claim 25, not claim 12.

Claim Rejections - 35 USC § 251

Claims 1-47 are rejected as being based upon a defective reissue declaration under 35 U.S.C. 251 as set forth above. See 37 CFR 1.175.

The nature of the defect(s) in the declaration is set forth in the discussion above in this Office action.

Claim Construction

All of the claims require an "inlet" or "inlet connection". In col. 6, lines 52-55, the '145 Patent says: "The specific inlet connection 16 varies by vehicle make, model and model year, but the inlet 17 is generally understood to refer to the vicinity of where hot water coming directly from the engine enters into the radiator 11." Patent Owner's remarks submitted May 24, 2016 on page 7 profess the intention

for the term inlet to indicate an opening in the wall of the heat exchange component through which hot water from the engine flows. In the same submission, Patent Owner agrees that the fill cap is a different structure. Therefore, the “inlet" will be considered to mean an opening in the wall of the claimed radiator through which hot water from the engine flows.

Claim Rejections - 35 USC § 103

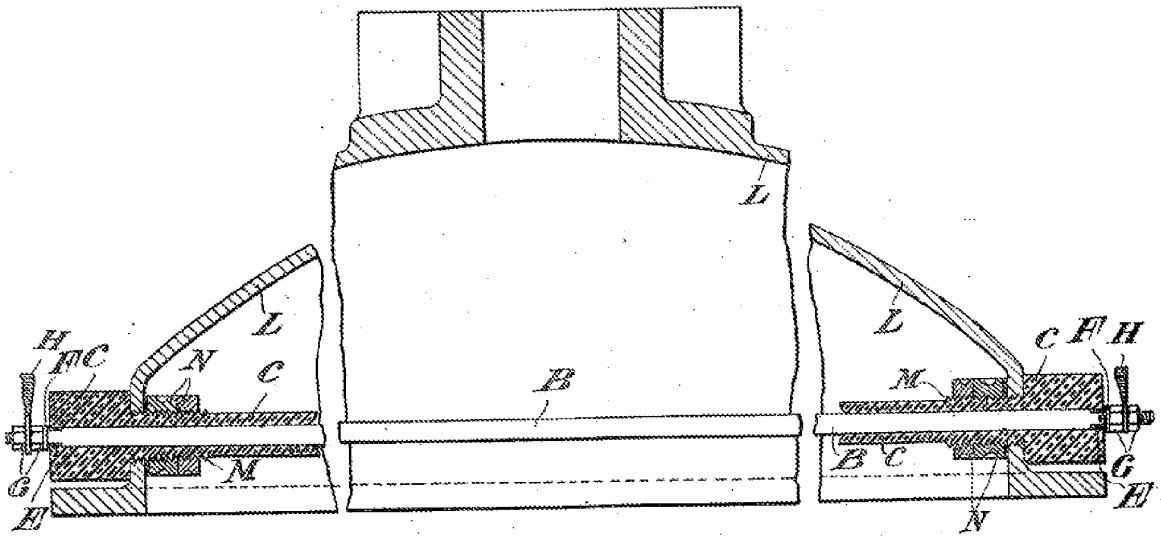
The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Claims 12, 17, 19, 21-25, 28 and 32-36 are rejected under pre-AIA 35 U.S.C. 103(a) as obvious over Gush (US 1,514,903) in view of Fahnestock, Murray; "Radiator Repairs"; Ford Care and Home Repair, How to Enjoy Your Ford Car, 1922 Edition (Hereafter “Fahnestock”).

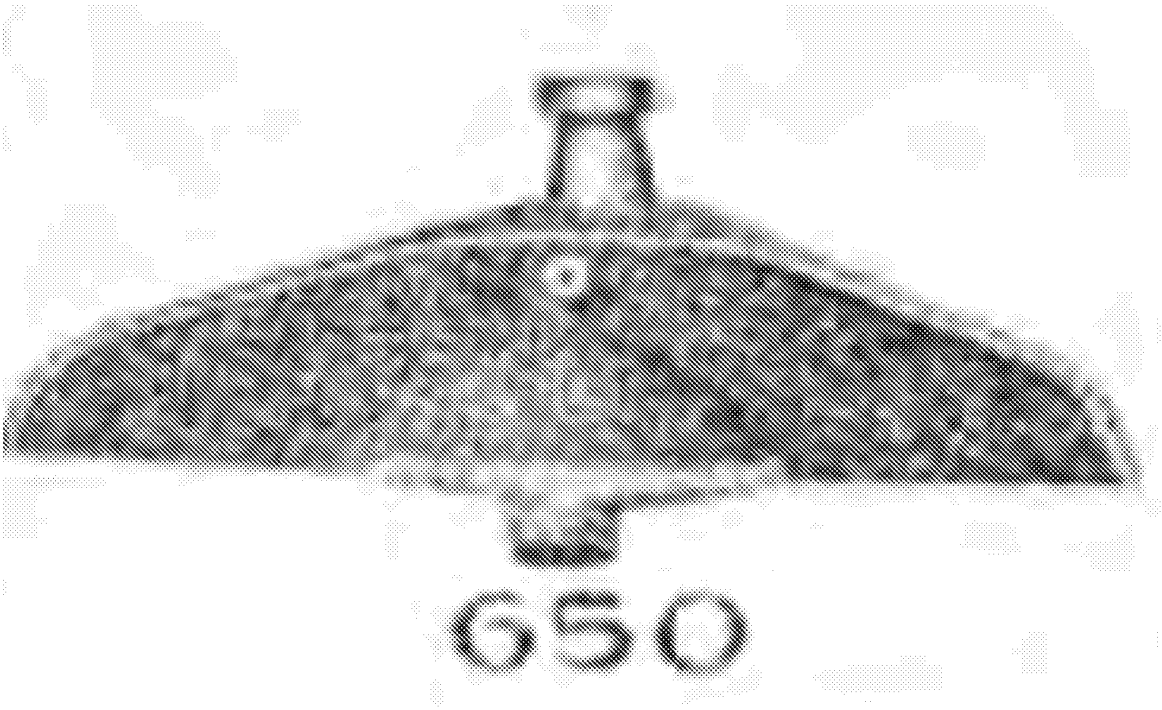
With regard to claim 12, Gush teaches a radiator having an anticorrosion electrode bar extending across the top of the radiator (see figures 1-3 and page 1, lines 90-104 and page 2, lines 12-19 and 35-44). Figure 3 is described in Gush as “a longitudinal section through the upper portion of the radiator of a motor vehicle showing the application of the invention thereto.” (page 1, lines 80-83) The top (“L") of a downflow radiator through which hot water was known to flow from an engine into a radiator is shown but the rest of the radiator is not shown.

Fig. 3.

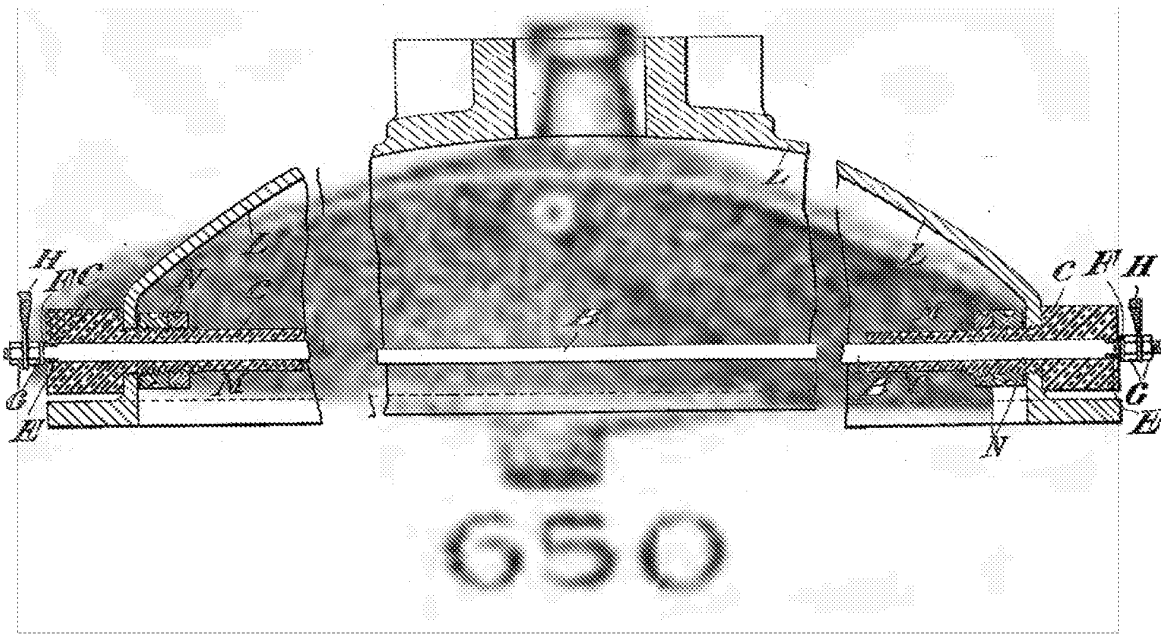


Gush teaches that the primary goal of its invention is to provide a way to install anticorrosion electrodes into radiators that don't normally have removable end plates or cover plates. (page 1, lines 36-45 and 64-74) Gush does not explicitly teach that the anticorrosion electrodes are within 10 inches of a hot liquid inlet to the radiator. The 1924 filing date of the Gush reference would indicate that its intention for use in water cooling apparatus of internal combustion engines would be relevant to vehicles in use in 1922. One common vehicle in use during that time period was the Ford Model T.

As taught by Fahnestock, a radiator for a Ford Model T such as one in use during the time frame of Gush is known to have a downflow design with a hot water inlet near the center of the bottom of the top tank. The top tanks of the 1916 and earlier as well as the 1917-1922 type of ford radiator closely resemble Figure 3 of Gush. The blown up illustrations on pages 3 and 5 of Fahnestock show an "inlet connection to header" and "inlet connection to top tank bottom" respectively. Details of both top tank configurations are clearer from illustrations of the separate inlets 629 and 630 and complete top tanks 649 and 650 listed on page 4 "nomenclature" and shown on page 6. A top tank circa 1922 would look like 650:



The Ford Model T represents an example of a vehicle commonly in use when Gush was filed, and a person of ordinary skill in the art would recognize that the upper portion of a radiator shown in Gush figure 3 closely resembles the upper portion of the Fahnestock radiator. Fahnestock also teaches on page 2 that corrosion of the inside of Model T radiators was a known problem that may necessitate radiator repairs. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to install the Gush electrode into the top tank of a Fahnestock radiator because Gush teaches that such a modification would protect motor vehicle radiators from internal corrosion. When Gush Figure 3 is overlaid upon Fahnestock 650, the relative locations of the Gush electrode and the Fahnestock inlet are clear:



Neither Gush nor Fahnestock explicitly teach that the sacrificial electrode must be placed within 10 inches of the hot liquid inlet to the radiator. It would have been obvious to place the Gush electrode within ten inches of the inlet of Fahnestock because the maximum distance between the two structures would have been a mere matter of design choice taking into consideration the width and depth of the vehicle radiator. In fact, when the hot liquid inlet is at the center of the bottom of the top tank as shown by Fahnestock, the inlet and the center of the electrode bar would have necessarily been less than ten inches from each other. Otherwise, the top of the Gush radiator would have to be at least ten inches deep with the inlet at the back of the radiator and the electrode at the front of the radiator. The '145 Patent expresses in col. 7, lines 38-43 various anode locations within the radiator and that the desirable locations were within 10 inches of the center axis of the inlet connection. However, no reasoning was set forth to define 10 inches as a critical distance.

With regard to claim 17, Gush teaches at page 2, lines 35-44 that electrodes would be inserted into suitable apertures in radiators of internal combustion engines.

With regard to claim 19, the electrode B of Gush is within the fluid flow as shown by figure 3.

With regard to claims 21-23, Gush teaches cooling water. Fahnestock discusses antifreeze as a coolant. It would have been obvious to employ water or antifreeze as a coolant because both were well known in the art as shown by Fahnestock.

With regard to claim 25, Gush teaches a radiator as set forth in the rejection of claim 12 above.

With regard to claim 28, Gush teaches at page 2, lines 35-44 that electrodes would be inserted into suitable apertures in radiators of internal combustion engines.

With regard to claim 32, Gush, Fahnestock or any teaching of a radiator for an internal combustion engine would necessarily enable air-cooling of hot liquid therein.

With regard to claims 34-36, Gush teaches cooling water. Fahnestock discusses antifreeze as a coolant. It would have been obvious to employ water or antifreeze as a coolant because both were well known in the art as shown by Fahnestock.

With regard to claims 24 and 33, Gush does not teach a second sacrificial anode. The '145 Patent does not describe a new or unexpected result for the addition of a second sacrificial anode. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a second anode into the radiator of Gush because it would have been a mere duplication of parts (see MPEP 2144.04 V.B.).

Claims 15, 16, 18, 26, 27, 30, 37-41 and 43-47 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Gush in view of Fahnestock as applied to claims 12 and 25 above and further in view of Guo Zhangeng (CN1225998, hereafter "Guo").

With regard to claims 15, 16, 26 and 27, Gush in view of Fahnestock makes obvious the method of claim 12 and the radiator of claim 25 as set forth above. Gush does not teach that the electrode disclosed is made of an active metal or made of one of aluminum, magnesium and zinc. In an analogous

teaching, Guo teaches a radiator 1 (also referred to as the 'heat sink') with a sacrificial anode 3 mounted on a bleed valve 4, both of which are located near the upper inlet of the radiator through a hole fitted for the bleed valve (see figure 1 and the machine translation of page 2 of the Chinese patent). Guo also states that "The anode may be placed unsecured in the heat sink, or the anode and heat sink may be secured together. For example, can be fixed on the deflation valve, or fixed on the plug. "

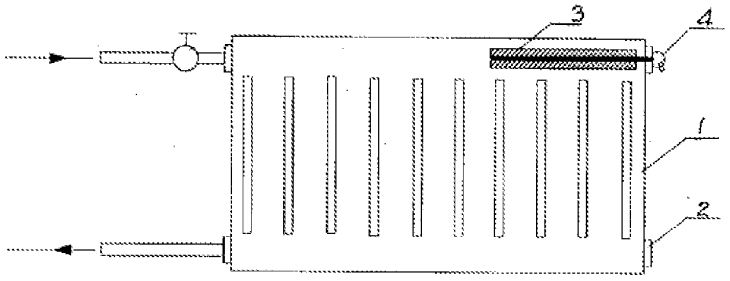


图 1

Guo figure 1 illustrates the anode assembly to be within the fluid flow path of the radiator. Also, page 3 of the translation of Guo, lines 8-9 state "and the anode can reach all immersed in the water after the radiator enters the water" (sic). Guo claim 4 teaches a magnesium, zinc or aluminum anode. It would have been obvious to utilize a magnesium, zinc or aluminum electrode in Gush because Guo teaches that these active materials were useful for protecting steel radiators.

With regard to claims 18 and 30, Gush does not explicitly teach that the electrode is grounded or grounded to the motor vehicle. A "lead H" is taught by Gush to be secured to either end of the electrode bar and furthermore "taken to a suitable source of electricity" (page 1, lines 105-109). The Gush electrode bar is mounted in an insulating sleeve C (see page 2, lines 12-19). Guo teaches that the anode is soldered inside the radiator with the anode in direct contact with the radiator metal (page 3, penultimate paragraph). It would have been obvious to connect the electrode of Gush in a grounded fashion to the vehicle in which it was installed because an electric circuit must be established for the

electrode to function in a protective manner. Gush is unclear where the circuit is completed, but Guo's anode is deliberately in electrical contact with the radiator itself. In either mounting, some other means of completing an electric circuit is necessary and if the radiator is mounted in a vehicle, the vehicle's body and frame is the most obvious means.

With regard to claim 37, Gush in view of Fahnestock teaches the electrode bar "B" used as an electrolysis prevention device as set forth in the rejection of claims 12 and 25 above. Furthermore, Gush teaches mounting the ends of the electrode bar in sleeves "C" shown in figures 1-3 and discussed in page 1, line 89 to page 2, line 19. The Gush sleeves support the electrode and the sleeves are adapted for installation in an engine radiator as claimed. Gush does not specify the metal of which the electrode bar is made or that it is an 'active metal'. Guo teaches in claim 4 sacrificial anodes made of magnesium, zinc or aluminum. It would have been obvious to use one of the Guo metals to make the Gush electrode because Guo teaches that these active materials were useful for protecting steel radiators.

With regard to claims 38-40, Gush does not teach that the electrode disclosed is made of an active metal or made of one of aluminum, magnesium and zinc. Guo teaches aluminum, magnesium and zinc as possible anode materials. It would have been obvious to use one of the Guo metals to make the Gush electrode because Guo teaches that these active materials were useful for protecting steel radiators.

With regard to claim 41, Gush does not explicitly teach that the electrode is grounded or grounded to the motor vehicle. A "lead H" is taught by Gush to be secured to either end of the electrode bar and furthermore "taken to a suitable source of electricity" (page 1, lines 105-109). The Gush electrode bar is mounted in an insulating sleeve C (see page 2, lines 12-19). Guo teaches that the anode is soldered inside the radiator with the anode in direct contact with the radiator metal (page 3, penultimate paragraph). It would have been obvious to connect the electrode of Gush in a grounded

fashion to the vehicle in which it was installed because an electric circuit must be established for the electrode to function in a protective manner. Gush is unclear where the circuit is completed, but Guo's anode is deliberately in electrical contact with the radiator itself. In either mounting, some other means of completing an electric circuit is necessary and if the radiator is mounted in a vehicle, the vehicle's body and frame is the most obvious means.

With regard to claim 43, the electrode "B" of Gush is effectively within the fluid flow as illustrated in figure 3.

With regard to claim 44, the sleeves "C" of Gush which correspond to the claimed anode holder are inserted into suitable apertures in radiators of internal combustion engines as taught at page 2, lines 35-44.

With regard to claims 45-47, Gush and Guo both teach that the hot liquid is water. Fahnestock discusses antifreeze as a coolant. It would have been obvious to employ water or antifreeze as a coolant because both were well known in the art as shown by Fahnestock.

Claims 20 and 31 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Gush in view of Fahnestock as applied to claims 12 and 25 above and further in view of Green (US 5,649,591).

With regard to claims 20 and 31, Gush and Fahnestock do not teach that the radiators comprise one or more aluminum components. The problem of electrolytic activity in the presence of aluminum components is discussed by Green in col. 1, lines 33-39 and sacrificial anodes are discussed for solving the problem in col. 1, lines 46-52. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the known sacrificial anode method and arrangement of Gush to an aluminum containing radiator because Green explains the utility of incorporating sacrificial anodes into modern aluminum-containing devices.

Claim 42 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Gush in view of Fahnestock and Guo as applied to the rejection of claim 37 above, and further in view of Green.

With regard to claim 42, Gush, Fahnestock and Guo do not teach that the radiator comprises one or more aluminum components. The problem of electrolytic activity in the presence of aluminum components is discussed by Green in col. 1, lines 33-39 and sacrificial anodes are discussed for solving the problem in col. 1, lines 46-52. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the known sacrificial anode arrangements of Gush and Guo to an aluminum containing radiator because Green explains the utility of incorporating sacrificial anodes into modern aluminum-containing devices.

Response to Arguments

Applicant's arguments filed October 4, 2018 have been fully considered but are moot in view of the new grounds of rejection.

Conclusion

Claims 1-47 are rejected.

Applicant is reminded of the continuing obligation under 37 CFR 1.178(b), to timely apprise the Office of any prior or concurrent proceeding in which Patent No. 8,236,145 is or was involved. These proceedings would include interferences, reissues, reexaminations, and litigation.

Applicant is further reminded of the continuing obligation under 37 CFR 1.56, to timely apprise the Office of any information which is material to patentability of the claims under consideration in this reissue application.

These obligations rest with each individual associated with the filing and prosecution of this application for reissue. See also MPEP §§ 1404, 1442.01 and 1442.04.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN E VINCENT whose telephone number is (571)272-1194. The examiner can normally be reached on 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean Witz can be reached on 571-272-0927. 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.

/SEAN E VINCENT/
Patent Reexamination Specialist
Central Reexamination Unit 3991
Conferees:

/ TERRENCE TILL /
Patent Reexamination Specialist
Central Reexamination Unit 3991

/JEAN WITZ/
Supervisory Patent Reexamination Specialist
Central Reexamination Unit 3991

Notice of References Cited	Application/Control No. 14/452,339	Applicant(s)/Patent Under Reexamination Petrosino, Frank	
	Examiner SEAN E VINCENT	Art Unit 3991	Page 1 of 1

U.S. PATENT DOCUMENTS

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

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Fahnestock, Murray; "Radiator Repairs"; Ford Care and Home Repair, How to Enjoy Your Ford Car, 1922 Edition; Trade Press Publishing Co., Milwaukee, Wis., 1922. pp. 2-8. (Year: 1922)
	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.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/452,339	Petrosino, Frank
	Examiner	Art Unit
	SEAN E VINCENT	3991

CPC - Searched*		
Symbol	**Date**	**Examiner**
see EAST search history	6-10-15	SV
above up to date	2-9-16	SV

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

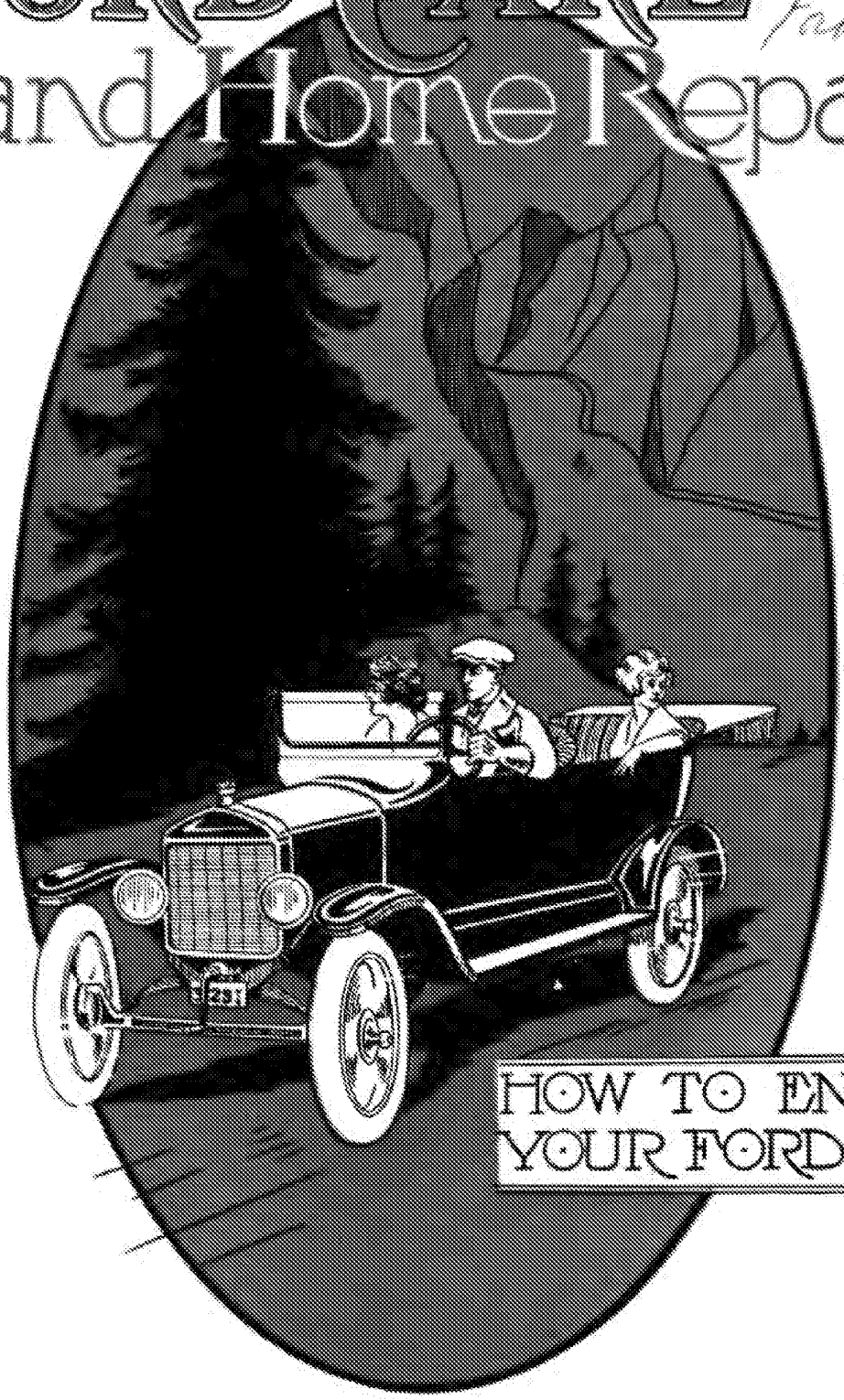
Search Notes		
Search Notes	**Date**	**Examiner**
see EAST search history	6-10-15	SV
prior prosecution and patent family reviewed	6-10-16	SV
above up to date	2-9-16	SV
SEE EAST SEARCH HISTORY	8-17-17	SV
searches UPDATED, prior prosecution history review UPDATED	1-30-18	SV
(sacrificial anode) (inlet) (radiator) before:priority:20081205 in google patents	1-30-18	SV
searches UPDATED, prior prosecution history review UPDATED	7-6-18	SV
all above up to date	11/27/2018	SV
google search "auto restoration parts supply"	11/29/2018	SV

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/452,339	Petrosino, Frank
	Examiner	Art Unit
	SEAN E VINCENT	3991

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

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FORD CARE and Home Repair



HOW TO ENJOY YOUR FORD CAR

1922 Edition

Preface

THE purpose of this book is to explain in a simple way how Ford owners can make some of the necessary repairs and adjustments of various parts of the Ford car. It is not intended to be a complete manual of car repair, but a valuable handbook on car economy, telling the driver how to operate his car at a saving and with the least probability of trouble. When complicated repairs are required, the car owner will always find it most economical and satisfactory to go to a first class repairman.

The several chapters in this book are reprinted from articles which have appeared in FORD OWNER and DEALER and reveal the character of the technical material which has made this magazine one of the most valuable and authoritative motor publications ever known.

While this book is confined exclusively to repair subjects, the monthly magazine, FORD OWNER and DEALER, covers many other departments of value and entertainment to anyone interested in the Ford car. Each issue contains more than two hundred pages full of features of interest including accounts of Ford tours, new Ford ideas and activities of the Ford Motor Co., short stories, helpful hints to Ford owners, "Questions and Answers," Fordson tractor articles, Ford speedster building, racing, etc., with many splendid illustrations.

If this little book proves interesting and instructive then you will surely find the big illustrated magazine, FORD OWNER and DEALER, a hundred times more valuable.

Practically all of these article were written by our own Technical Editor, Murray Fahnestock, who writes exclusively for the FORD OWNER and DEALER.

Regular subscribers may obtain a copy of "Ford Care and Home Repairs" for ten cents.

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Radiator Repairs

By Murray Fahnestock.

In this particular article, we shall attempt to describe the location of leaks and the repair of Ford radiators from the point of view of the individual car owner, who has but few tools, still less equipment, and but limited knowledge and experience of radiator repairing.

In some future article we hope to describe the repairing of radiator with tools, equipment, knowledge and skill from the point of view of the Ford car repairman, who makes a specialty of the quick and profitable repair of Ford and Fordson tractor radiators.

Of course, the repairman will get all the more DIFFICULT kinds of radiator repairing, for which he will charge accordingly. While the majority of repairs, to be described in this article, are those which are most easily and most simply made, without the necessity of taking the entire radiator apart.

THERE is always more radiator repairing to be done in the spring and early summer for two chief reasons. The first of these reasons being the bursting of radiators, due to the freezing and the expansion of the water. The second reason is due to the fact that the use of some anti-freeze solutions has a corrosive effect on the tubes and tanks of the radiator and these leaks become most noticeable when the radiator is put into service in the early spring months.

The repair of radiators is particularly interesting in the spring, as that is the time when radiators are most frequently overhauled in putting the car into condition for a summer of pleasant use. And, as overheating is most prevalent during the hot summer months, it is necessary that these leaks be eliminated for summer driving. Otherwise, leakage of the water will result in lowering the cooling solution to such an extent that the engine will overheat and cause trouble on long summer drives.

The spring is also a good time for the car owner to test and, if possible, repair the radiator of his own car. If he cannot repair the radiator, then the spring months, when the repairmen are not quite so busy as later in the summer, is a good time to take the radiator to be completely overhauled, if the inspection by the car owner finds this to be desirable and necessary.

As some anti-freeze solutions leave more or less of a deposit or scale on the inside of the radiator and tubes, it is also a good plan to have the radiator cleaned out, if trouble from this source is suspected.

Some of the causes of radiator troubles are due to the **unequal distribution** of the anti-freeze solution, when the calcium-chloride solutions are mixed up. If the solution is stronger at one part than at another, this concentrated solution may have a tendency to corrode the radiator tubes and cause trouble.

Another cause of radiator troubles is the clogging of the overflow pipe of the radiator by either dirt or sediment, or perhaps by freezing. If this overflow pipe becomes clogged and the radiator cap fits tightly, then a frozen radiator, or even the steam developed in the top part of the cylinder head during hard driving, may cause a considerable pressure on the inside of the cooling system.

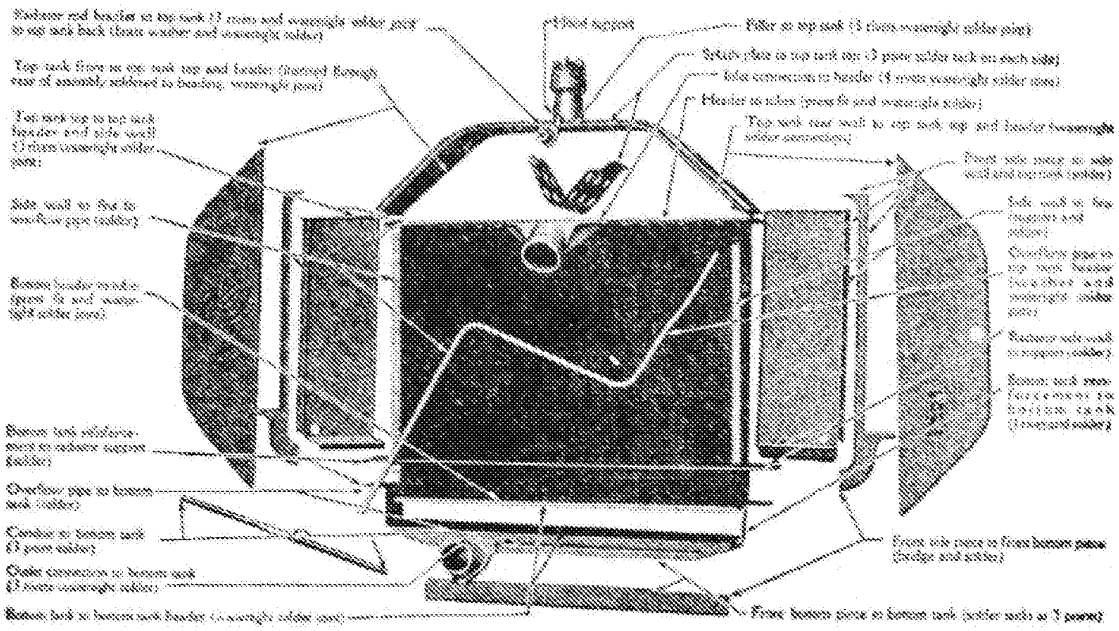
If this pressure exceeds 10 or 15 pounds to the square inch, it is quite easily possible that this may find some leaks in the cooling system at soldered joints which are not overly strong, or may split or burst some of the tubes.

Clogged Tubes.

Another cause of leaking radiators is the clogging of one or more of the tubes. When this occurs, the water ceases to circulate in that particular tube. And it is possible that the anti-freeze solution may not replace the water in that particular tube. Or, if the radiator is drained, it is probable that the water may not be drained from that particular tube. Consequently, a cold spell may cause the bursting of one or more clogged tubes, and for this reason it is particularly desirable to have a clean radiator for use during the winter months.

There are 95 vertical tubes in the radiator of the Ford car. These tubes are of copper. As these tubes are in five layers, from front to rear, that means that there are nine rows of tubes across the front of the radiator, and that the tubes are five rows deep in the radiator.

The important fact about this is, that if the leakage should occur in one of the inner rows of tubes, then it is very difficult to reach these inner tubes for soldering and repairing. When troubles develop in one of the inner rows of tubes, it is quite frequently necessary to take the radiator to a skilled repairman to have this leaking tube either soldered or replaced. In fact, even the repairman will usually replace the tube, rather than attempt to solder a tube in one of the inner rows.



1916 and Earlier Ford Radiator.

As the clogging of one or two tubes will only restrict the efficiency of the cooling system by about 1% per tube, it follows that, if it were easy to plug the tops and bottoms of these tubes, this would be a good method for repairing the tubes for temporary use during the summer.

However, as it is necessary to unsolder the top and bottom tanks of the radiator, in order to obtain access to the ends of the tubes, this makes a rather difficult repair and it is far more easy to describe the manner in which the tubes can be plugged, than to actually do the work.

Cleaning Radiator.

One of the methods which tends to lengthen the life of the radiator in general use, when no anti-freeze solution is used, is to drain the radiator occasionally to remove the sediment which accumulates from the water. This will also remove bits of metal, and rust and scale, which come from the water pockets of the cylinder head. It is sometimes advisable to wash out the radiator, including the cooling system of the engine, by means of a solution composed of a half pound of lye dissolved in about five gallons of water.

The radiator should first be drained. And then filled with this solution. And the engine driven for about five minutes with a retarded spark in order to heat the cooling solution. The heat hastens the chemical activity of the lye, and enables the radiator to be cleaned out more quickly.

After this, the radiator and the cooling system should be drained and refilled with clean, fresh water, and then the engine should be again run for a few minutes and this water drained out. Finally, the radiator can be filled, with the expectation that no further corrosion of the cooling system from the lye will take place.

It is a good plan to examine the radiator tubes occasionally to make sure that none of the radiator tubes are dented or pinched, as this will cause the easy clogging of the tubes by mud or sediment, or by the freezing of the water in cold weather.

Paint Restricts Radiation.

It is important that the tubes and fins of the radiator be not covered with a heavy coat of paint, as paint seriously interferes with the free and easy radiation of the heat. If the tubes and fins of the radiator are painted at all, this should only be done by using a thin, dead-black paint; such as is made by mixing lampblack and turpentine.

Enamel, or light-colored paints interfere with the radiation of the heat, and should never be used. The practice of painting the core of the radiator with an aluminum or gold paint seriously interferes with the cooling of the radiator, and the efficiency of the engine.

The manner in which the removable radiator shell of the 1917 and later radiators is painted does not make any particular difference, as this shell is insulated by an air space from the core of the radiator, and does not have any practical effect on the cooling of the radiator and the radiation of heat.

On the 1915 and earlier radiators, the manner in which the tanks are painted, does have some effect on the cooling, as the side and top tanks on these earlier radiators were in close metallic contact with the radiator tanks and core.

The horizontal fins, between the radiator tubes, should be kept clean and evenly spaced, so as to allow the air to pass freely through the core of the radiator. If these fins become bent, they can be straightened by the use of wide, flat-nose pliers, or by the use of a special tool which is made for just this

purpose, and consists of a number of flat strips of metal, placed at a particular distance.

1916 Ford Radiators.

There are two types of radiators in general use on Ford cars. The earlier type of radiator, of the "angular" design, was used on 1916 and earlier Ford cars. Most of these radiators have been replaced by the 1917 and later type radiator of the stream line type, as used on Ford cars of 1917 and later models. However, there are still many of these old brass radiators in use on Ford trucks and commercial cars, so that it is necessary to know how to repair them, as well as to know how to repair the later models.

Referring to the picture of the 1916 type radiator, showing the parts dissembled; it will be found that the radiator filler spout is fastened to the top tank of the radiator, and the bracket which holds the front end of the radiator to dash rod is also soldered and riveted to the same plate.

Beneath this top plate of the radiator is the "splash" plate, which is soldered to the top plate of the radiator. This splash plate is to prevent, to some extent, the splashing of the water from one side of the radiator to the other, and to distribute the water from the inlet hose connection to all the tubes more equally.

This splash plate sometimes becomes loose from its soldered connections in the radiator, and then tends to rattle around in the radiator when the water level is low. This will do no particular harm, except for the fact that a loose splash plate is apt to cut through the radiator overflow pipe, down where the radiator pipe passes through the bottom plate of the top tank of the radiator. If this occurs, then it will be impossible to keep the water level in the radiator higher than this leak in the overflow pipe, as all the water will tend to run out through the overflow pipe as soon as this level is reached.

To prevent this trouble with splash plates, it has been suggested that the splash plate be doubled up by means of pliers, and pulled out through the top filler opening of the radiator. This suggestion is only offered for what it is worth, and is usually more easily said than done.

In order to obtain access to the top of the tubes of the radiator for repairing, it is necessary to remove the plate from the back of the top tank of the radiator. This allows access to the entire interior of the top tank, and also to the top ends of the tubes. For a complete overhauling, when some of the tubes are to be replaced by new ones, then it is desirable to remove the entire tank from the radiator. But this is usually beyond the ability of the individual car owner. And if such repairs are necessary, the radiator should be taken to a competent repairman.

When making repairs at the bottom of the radiator, it is only necessary to remove the front plate from the bottom tank, but this does not give much space in which to work, so that it is rather difficult to solder or repair the bottom ends of the tubes.

In the 1917 and later radiators, the repairing is sometimes a little easier to accomplish because there is a radiator shell which is easy to remove, and which permits access to the tubes and fins of the radiators, and covers up any rough soldering of the different parts.

Radiator Nomenclature.

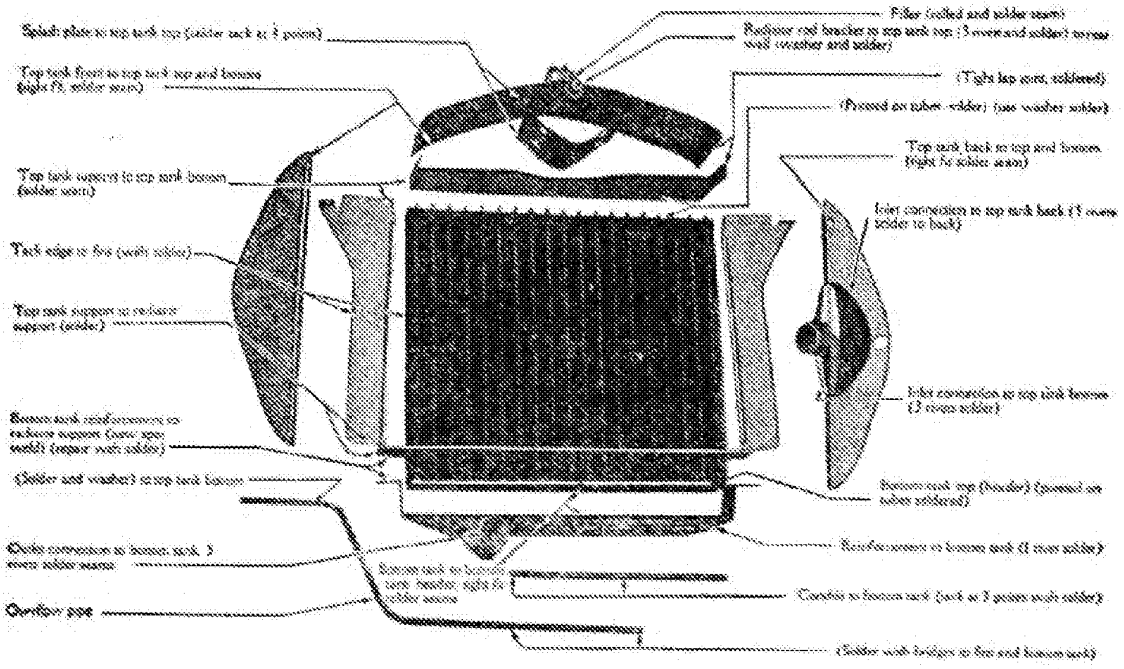
As it is necessary to know the names of the different parts, so that one can order parts intelligently; or understand directions for radiator repairing; we have shown a page of illustrations of parts so that one can call a bracket by its rightful name, and not refer to as a "dewhicky" or "thingamajig."

No. 622	Brace (side)	1909-16
623	Bracket (rod on rad)	1909-21
624	Bottom (up. tank)	1909-16
625	Bottom (up. tank)	1917-21
626	Clasp (hood on rad)	1909-21
627	Core	1909-16
628	Core	1917-21
629	Con. (inlet)	1909-16
630	Con. (inlet)	1917-21
631	Con. (outlet)	1909-21
632	Cover (lower tank)	1909-21
633	Pin	1909-21
634	Flange (filler)	1909-16
635	Flange (filler)	1917-21
636	Nut (hose clip)	1909-21
637	Piece (fro. bot.)	1909-16
638	Piece (fro. side) R.	1909-16
639	Piece (fro. side) L.	1909-16
640	Pipe (overflow)	1909-16
641	Pipe (overflow)	1917-21
642	Plate (splash)	1917-21
643	Screw and nut	1909-21
644	Screw and Nut	1909-21
645	Support	1909-21
646	Support (lower tank)	1909-21
647	Support (up. tank) R.	1917-21
648	Support (up. tank) L.	1917-21
649	Tank complete (top)	1909-16
650	Tank complete (top)	1917-21
651	Tank (lower)	1909-19
652	Top (up. tank) less filler flange	1909-16
653	Top (up. tank) less filler flange	1917-21
654	Tube	1909-16
655	Tube	1917-21
656	Wall (L)	1909-16
657	Wall (R)	1909-16
658	Wall (up. tank front)	1909-16
659	Wall (up. tank front)	1917-21
660	Wall (up. tank rear)	1909-16
661	Wall (up. tank rear)	1917-21
662	Wall assem. (rear)	1917-21

Testing for Leaks.

When testing the radiator on the car, one of the easiest ways to test the radiator for leaks, after having filled the radiator to the top, and dried off the outer surface of the radiator, so that leaks can be discovered, is to race the engine at high speed. A radiator will frequently develop leaks, when the engine is running at high speed and vibrating considerably, while it may seem to be almost leak-proof when the engine is running idly at slow speeds.

Of course this racing of the engine should not be overdone, as it is perfectly possible to shake a good radiator to pieces by undue racing of the engine.



Present Type of Ford Radiator.

If this does not show up the leak, then it is possible to hold one's finger over the radiator overflow pipe, while the engine is run at a fairly good speed with a retarded spark. And perhaps with the radiator covered over with a blanket, so as to develop steam in the cylinder head and subject the radiator to considerable pressure. Care should be taken not to develop more than about 15 pounds pressure in the radiator, as too much pressure might blow up a perfectly good radiator.

Another method of testing the radiator in the car is to connect a tire filling hose, from an air pressure system, to the overflow pipe of the radiator. Take care that a good gasket is fitted into the radiator filler cap, so that no leakage of air will occur at this point.

If one has an old radiator filling cap available, the tire valve from an old tire tube can be fitted into a hole drilled through a radiator cap. This will form a convenient way of pumping air pressure into the radiator or of using a tire gauge to measure the air pressure to which the radiator has been subjected —being sure, of course, that the tire gauge is capable of correctly measuring pressures as low as 10 or 15 pounds to the square inch. Some tire gauges are not accurate, until pressures of 40 and 50 pounds and upwards are reached.

When the tire pump is attached to the valve in the radiator cap, and the air pumped into the top part of the radiator, then it is necessary to plug up the radiator overflow pipe with a wooden plug, while using this method of testing, for leaks.

Another method of plugging the radiator overflow pipe, while making tests, is to slip a piece of heavy walled rubber tubing over the radiator overflow pipe, and then doubling over the end of this rubber tube to prevent the escape of air.

Removing the Radiator.

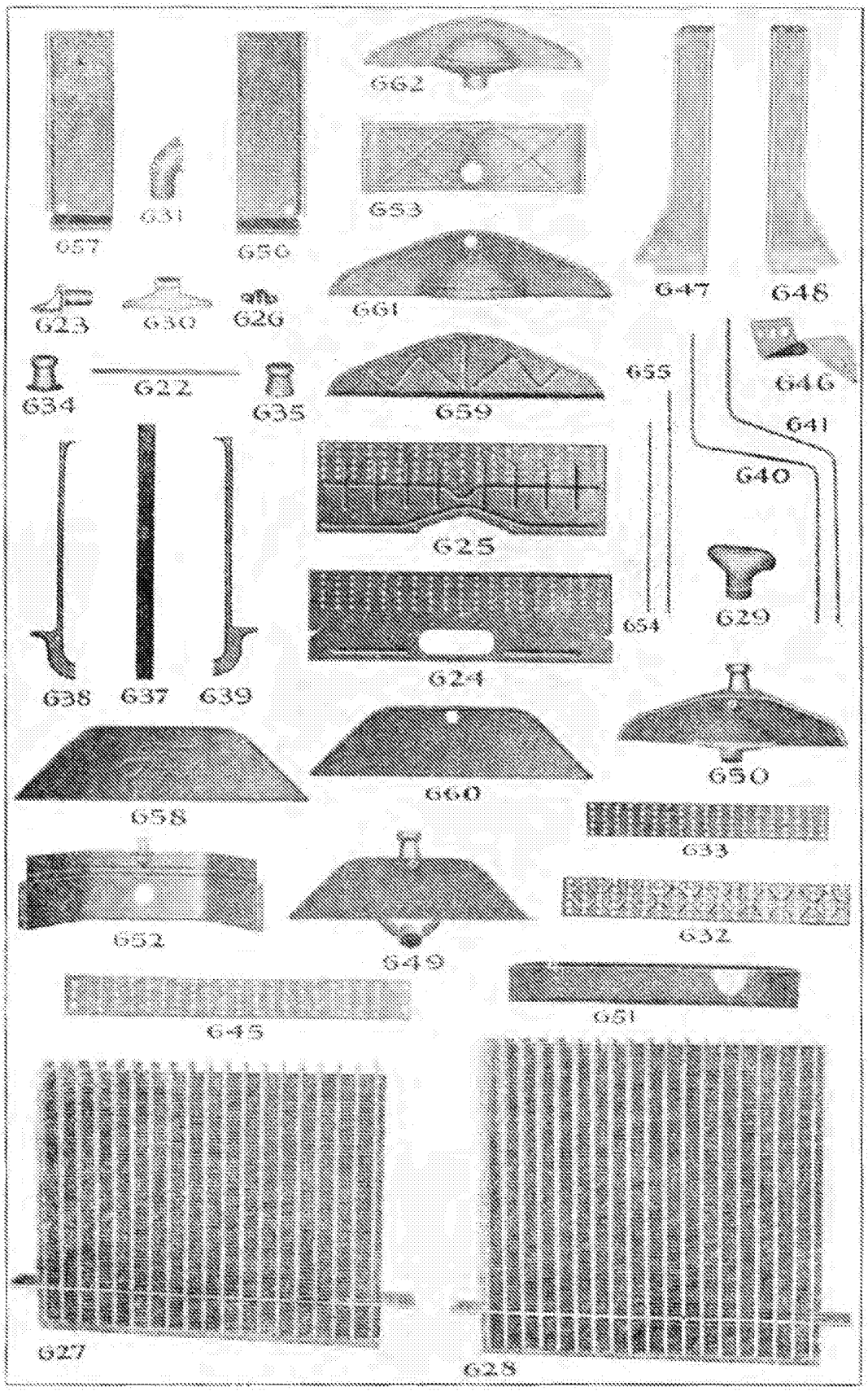
To remove and replace the Ford radiator is supposed to occupy about 45 minutes of the time of a fairly skillful repairman. It is not to be supposed that the individual owner of a Ford car will be able to do the work as rapidly as this. The individual owner of a car usually finds, when he is repairing the radiator, that other parts can be given attention. And these little "touches in time" which may save trouble on the road, will increase the time required for removing and replacing the radiator.

In replacing the Ford radiator, the first operation is to open the radiator drain cock and drain the radiator, saving the non-freezing solution, if one has been used. As the radiator drain cock is usually clogged with mud and sediment, it is often necessary to use a wire to clean out this mud, in order to drain the radiator.

We are now ready to lift off the hood and to place it in some convenient location, say on the left-hand running board. It is well to make a practice of placing the different parts in the same place each time, in order that one may form habits, which will be conducive to more rapid work.

We are now ready to loosen the top hose connection, between the radiator and the cylinder head. And there are two possible methods in which this work can be done; the preferable method depending upon the condition of the top water outlet hose.

If the water outlet hose appears to be in good condition and you do not think it will be necessary to replace the rubber hose, then the quickest and best method of procedure is



Radiator Parts.

to use the cylinder head bolt nut wrench to loosen the two cap screws, holding the water outlet hose connection to the cylinder head, and to remove the water outlet hose casting with the radiator hose and radiator.

This eliminates the necessity of loosening the joints between the rubber hose and the cast iron fittings. And, as it is sometimes difficult to obtain a water-tight connection when replacing the hose, it is better to make the disconnection between the cast iron flanges if possible.

However, if the top water outlet hose connection appears to have become rotted and to require replacement, then it will be better to loosen one of the clamps holding the rubber hose in place. And to pull out the radiator hose connection from the rubber hose. This will give an opportunity for examining the condition of the rubber hose, and for replacing it more easily if necessary. By using one's head, instead of one's hands, much time can be saved.

After removing the two cap screws, holding the top water hose connection, pull out the gasket. Clean this copper-asbestos gasket before placing it on one of the front fender aprons.

Now use the same cylinder head bolt wrench for loosening and removing the two cap screws which hold the side water inlet hose connection to the side of the cylinder block. Then remove and clean the copper-asbestos gasket which was between this side water hose connection and the side of the cylinder block.

As a rule, the rubber hose connections, at the two ends of the outlet connection pipe, do not become worn and rotted nearly as quickly as the top water outlet hose for two good and sufficient reasons.

One of these reasons is that the top water outlet hose is exposed to the action of much hotter water than the lower hose connection. Also, it is sometimes exposed to the action of the oil which floats on the top of the water. Another good reason is that there is always considerable vibration, between the top of the radiator and the cylinder block. Thus this top water outlet hose is twisted and stretched, to a much greater extent than the side water connections.

There is no economy in replacing defective rubber hose on the water outlet hose connections of the radiator. The cost of the hose connections is only about one-third of the cost of installing them, so that, if it becomes necessary to change the hose at a later date, the probable expense of changing these hose will be greater than if these hose had been replaced when the radiator was off the car for other repairs.

We are now ready to loosen and remove the headlight wires from the lamps, if the car is one of the older types of Fords. In later type Fords, it is not necessary to remove the headlight wires when removing or replacing the radiator, though it may be necessary to disconnect and remove the cross wire running between the two headlights.

We are now ready to straighten the end of the carburetor pull rod, and to remove this pull rod from the carburetor choker arm. And to pull out this rod from the front of the radiator. Be careful, when removing this pull rod, not to damage the tubes of the radiator, as the tubes are made of comparatively thin copper and are easily damaged. Place this radiator pull rod also on the left-hand running board.

Now pull out the cotter pins from the nuts which hold the radiator to the chassis. If this is an old-style Ford, having brass nuts and brass cotter pins, save the brass cotter pins. But if the cotter pins are of steel, throw them away and use new ones.

We are now ready to use a speed wrench or an s-wrench, for removing the nuts holding the sides of the radiator to the chassis frame. It often happens, when one attempts to turn these nuts, that the stud turns inside of the chassis frame. The bottom end of this stud goes through a small metal plate and is fastened by another cotter pin through the bottom end of the stud.

If the plate assembly twists around inside of the chassis frame, it may be necessary to use a tire iron or a screwdriver blade, and wedge between the edge of this flat plate and the side of the chassis frame, to keep the plate holding the stud from turning, while the nut is being removed from the top of the stud.

Now loosen the lock nut on the radiator-to-dash rod. This nut is adjacent to the dash board of the car. Then a pair of pliers, or a pipe wrench of say the six-inch size, can be used to unscrew the radiator-to-dash rod from the socket in the radiator.

We are now ready to stand in front of the radiator and, by grasping one side of the radiator in each hand, to lift the radiator off the car—using care not to scratch the radiator, or the headlamps, any more than is absolutely necessary.

If this is one of the late model Ford cars of 1917 or later date, one should remove the radiator shell, before attempting to remove the radiator core and tanks.

Replacing the Radiator.

Before replacing the radiator, one should examine the fabric gaskets on the side members of the chassis frame, to make sure that these gaskets are in good condition and properly placed over the radiator studs, before putting the radiator back in place.

It is also a good plan to clean the flanges of the cylinder block, where the hose connections are bolted on, as it is necessary to have clean surfaces for the gaskets, if a water-tight joint is to be secured.

Before replacing the radiator on the car, close the radiator drain cock, and make sure that it is screwed tightly into the bottom tank of the radiator.

We are now ready to place the radiator core and tanks in place. And, after this has been done, the radiator shell can be dropped down, using care not to bend the fins between the tubes or to scratch the headlamps.

After the radiator has been placed in position, we can bolt up the gasket, between the top water outlet hose connections and the flange at the front end of the cylinder head. Before putting the gaskets in place, it is a good plan to smear these gaskets with heavy

cup grease. This cup grease helps the gaskets to settle properly into place, so that they will bed down more firmly and make a water-tight joint.

While some car owners use shellac for making these joints, the trouble with shellac is that, when the parts are being removed, it is necessary to scrape off the shellac. And very frequently the gaskets are injured when this is done, thus making it necessary to use new gaskets each time. And also making it necessary to scrape off the flanges each time the work is done.

If the flanges are scraped clean and smooth, and if the cap screws are tightened down evenly, no trouble should be secured in making a water-tight joint at both of the water connections. While it is sometimes necessary to use a new gasket, it is the general rule that such gaskets only need to be replaced by new ones after the radiator has been removed three or four times, or after one or two years of service.

After water-tight joints have been secured between the rubber hose connections and the cylinder head, and cylinder block; we can then bolt the radiator down into place on the side members of the chassis frame.

When tightening the nuts holding the sides of the radiator to the chassis, these nuts should not be tightened too firmly, because if they are, the springs inside of the chassis frame will be drawn down so solidly that there will not be any "give" or yield and an undue strain will be put on the radiator, when the car is driven over rough roads and the chassis frame twists and bends. These springs were put in with a definite purpose of affording a "yielding" support at this point. And the radiator stud nuts should only be pulled down enough to allow the cotter pin to slip through the holes in the studs, and through the notches of the nuts, so that a yielding and flexible support will be secured.

The final part of the work is to tighten the radiator-to-dash rod, fastening this rod into the front end of the radiator, and using care to make the distance, between the radiator and dash of the proper length, so that the hood will just fit between the dash board of the car and the radiator shell.

By turning to radiator-to-dash rod farther into the socket in the radiator, the adjustment between the radiator and the dash is changed, and the appearance of the car will be improved by paying attention to secure the correct distance between the radiator and the dash, so that the hood fits snugly and evenly at both the dash board and the radiator.

Removing Transmission

To remove the Ford transmission for repairs, without taking the engine out of the car, proceed as follows.

Unbolt universal joint housing and take out rear end.

Remove transmission cover.

Remove all bolts that hold cylinder block to the crank case. But do not remove the two bolts nearest the front end. Merely loosen them.

Attach a chain block to the rear of cylinder block, and lift the cylinder block about ⅝ inch. (The two bolts left in place in the front end will prevent the cylinder block from sliding forward and dislodging the gasket.)

The driving plate, part No. 3321 can now be removed by taking out the six cap screws which hold it. The clutch disc drum, part No. 3332, and the thrust plates can now be removed. Then the transmission drum assembly and the triple gears. This method is much quicker than "pulling the motor".

Windshield Clear in Rain

Driving a car during a rain storm, without some device for keeping the windshield clear, is sure suicide and murder. I have found the following method for preventing the rain from collecting in globules on the shield to be very effective and practical. One cleaning will last from one to two hours during storm.

Purchase from any garage one piece of felt gasket stock ½ inch thick by three inches square. This pad will fit nicely into a thin chewing tobacco pocket box, obtainable at any drug store.

Place pad in dish and pour over it a solution of Glycerine and Witch Hazel—water could be used instead of Witch Hazel, but it sours. About three ounces Glycerine, one ounce Witch Hazel. Let pad soak over night and gently press out surplus, by squeezing in hand.

When windshield is thoroughly wet; rub pad over glass evenly, up-and-down—never lengthwise—thus leaving thin coating of Glycerine, on which the rain will "flatten-out" giving clear view ahead. Keep pad in tin box when not in use, it stays clean.

Care and Adjusiment of The Timer

Timers—thy name is legion, and then some! There are good timers, old-timers, new timers, poor timers and punk timers. The infinite variety includes roller-brush timers, wipe-contact timers, magneto-contact type timers, porcelain timers, flat-spring timers, coil-spring timers, ball-contact timers, knife-contact timers, end-contact timers, carbon-brush timers, ball-bearing timers, oil-less timers, grease-filled timers—and twice as many other kinds, too numerous to mention.

WHEN we first started to write this article, we intended to illustrate and discuss the leading makes or types of timers, but it did not take long for us to realize that the "leading" types of timers "lead" in every direction, and that it would take a "master mind" of the Darwin type to properly classify the different types and do them justice.

In the present article, it is the intention to describe theory and practice in the care and repair of the regular Ford dirt-and-grease covered timer, that comes with the car. Because it is usually such a filthy mess, most of us leave the timer alone as much as possible, and few of us understand it as well as we should.

If we understand the care of the regular, roller brush type of timer, it will be easy to understand the correct method of handling most of the special types of timers, though some special instructions, on the installation and care of special timers will also be given.

Parts of Timer

In order that there may be no mixup in regard to the names of the different parts, we have shown the working parts of the standard timer assembled.

It will be noticed that the cast bronze "hub" has a slot in one side. This "notch" is for straight steel pin which extends through the end of the cam shaft, and "locates" the roller brush assembly in the proper relative position on the cam shaft, thus timing the spark.

On the older timers, made several years ago, this hub was "notched" on both sides, and the cotter pin engaged both sides of the hub. On present timers, this notch is only cut on one side of the hub. And so it is necessary to cut off about one-eighth of an inch from an old pin, or to use a new pin, with a new-style roller brush assembly.

As the only force tending to shift the position of the roller brush assembly on the cam shaft is the slight friction of the roller against the contact segments, this means that the cotter pin through one side of the hub is amply sufficient to hold the hub roller brush assembly firmly in place.

The "roller arm" is also a bronze casting and, being a "casting," it is not well to treat it too roughly, or it may break suddenly. However, in a later part of this article, we shall show how it is sometimes necessary to bend this roller arm a wee bit, in order to obtain better contact between the roller and the contact segments.

The "hub cap" of pressed steel, fits over the end of the bronze hub, and its function is to keep the steel cotter pin from dropping out of its place in the end of the cam shaft. If the nut, on the end of the cam shaft is allowed to become too loose, then this washer will shift, the cotter pin will fall out, and then the roller brush assembly will turn on the cam shaft. This will throw the timing of the spark, for all four cylinders, badly out of kilter, and will stop the engine if the roller brush assembly slips much.

If the engine stops suddenly, and the sparks seem "all mixed up," and occur in the wrong cylinders, then the possibility of a "shifted" roller brush assembly should be investigated.

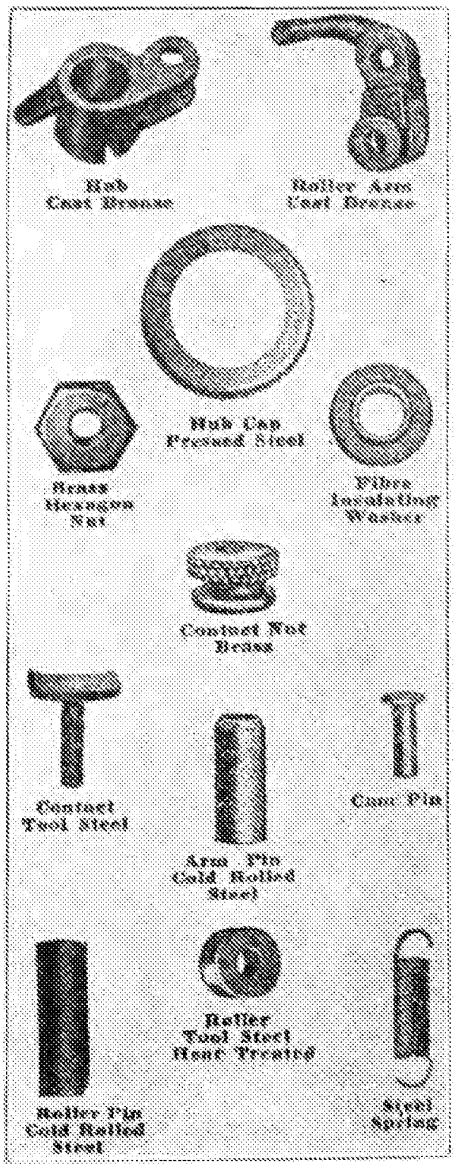
The fibre insulating washer surrounds the steel screw or stud of the contact segment, and keeps it from making contact with the steel or aluminum case of the timer. These insulating washers should be kept fairly clean, and free of bits of metal, or fragments of wire, which might cause a "short" between the contact screw and the shell, or case.

The "hexagon brass nut" should be kept fairly tight. If allowed to become loose, the end of the contact segment can tilt up. This will tend to cause "jumping" of he roller, and uneven wear of the raceway on which the roller runs. It is a good plan to tighten all four of these hexagon brass nuts, when overhauling the timer, as the fibre shrinks with use, and wear tends to loosen the contacts—unless these nuts are given a half-turn or so to tighten them, every now and then.

The "contact segment" of tool steel, is one of the vital parts of the timer. When this crescent-shaped piece of steel becomes rough and worn, then poor contact will be made and the engine will run badly. Sometimes the screw becomes loose in the contact and, when

this occurs, the screw should be rivetted more tightly into the contact segment.

The "arm pin" of cold-rolled steel, on which the roller arm oscillates slightly in or out, to compensate for inequalities in the distance between the cam shaft and the roller race-way, as the roller brush assembly rotates, receives but little wear, as the movement on this large pin is comparatively slight and slow. In checking over this part of the timer, the fit should not be "shabby" but the roller arm should swing in or out freely and easily, without binding, yet without undue looseness.



Timer Components.

The cam "cam pin" is a straight piece of cold-rolled steel, though a pin can be cut off from a wire nail, if the regular pin is lost—as any kind of steel is amply strong for the slight strain in this particular part. However, the pin should be a good "fit," as the fit of this pin determines the "timing" of the spark advance, and too small a pin will allow the hub to shift on the cam shaft and out of the correct position.

The "coil spring" is made of spring steel, and should be replaced if it has become stretched or broken. Fortunately, these springs are stretched such a very short distance that their elastic limit is seldom exceeded, and so they very seldom break. But, difficulty in starting the engine—though it might run after once being started owing to the centrifugal force holding the roller brush in contact with the segments—may cause the timer to be suspected of having a broken spring in the roller brush assembly.

The "roller pin" is of cold-rolled steel and needs to be hard, as this is one of the points that receives most wear, owing to the high speed at which the roller revolves on this pin. When examining the timer, make sure that this pin is firmly rivetted in place in the roller arm. If not, rivet the pin securely into the roller arm, as there should be no looseness or play, between the roller pin and arm, to cause poor contact, and wabbling of the roller.

As practically all the wear is concentrated on one side of the roller pin, the turning of the roller pin will tend to equalize the wear, and will help somewhat, if the pin is given just a half-turn, so that the opposite, and less worn side, is brought outside to support the roller against he race-way.

We now come to the last—but by no means least—vital part of the Ford timer. In fact, this "roller" is usually the chief source and chief sufferer from trouble. The roller is made from high-grade steel, and is heat treated and tempered, to make it wear as long as possible, in spite of the rough traveling at high speeds that it does over the steel contacts and the fibre insulation of the race-way of the timer shell.

When this roller is case hardened, it sometimes happens that the hardening is not uniform over the entire surface, and the roller may be harder or softer towards the ends, with a ring of differently hardened steel around the center. This may cause rings or "grooves" to wear in the race-way on the inside of the timer shell.

Function of Timer

While some people may think that we are needlessly "fussy" in regard to the timer, it is necessary to understand the functions of the timer, in order that we may more fully realize the importance of this vital part of the engine. A large percentage of the Fords, that one encounters on city streets and country roads, could be greatly improved by the installation of a new timer—or by taking better care of the old one.

The name "timer" means that this device times the spark, thus firing the charge at precisely the proper instant—and not a fraction of a second too early, or a little too late. In spite of its comparatively simple appearance and outwardly rough workmanship, the timer is—or should be—an instrument of precision, making the contact at precisely the proper instant, and accurately timing the spark.

Most car owners wait until the timer fails

to fire the charge in one or more cylinders—before cleaning or replacing the worn parts. Few of us realize that the efficiency of the engine may be greatly impaired, and that the power may be reduced by several horse power, by an inaccurately timed spark and by what we might call "partial" misfiring.

Those of us who have followed the glorious career of Man-O-War, the fastest racehorse in the world, may not have realized that one of the factors of the speed of this horse is due to the fact that his steps have been timed with wonderful accuracy. Other horses may have had the muscles, but Man-O-War had the nerve development that enabled him to time his strides accurately.

If Man-O-War should lose this gift of accurate timing—he would then be only a horse, capable of pulling the family buggy and worth a couple of hundreds of dollars perhaps, as compared with the hundreds of thousands of dollars which have been offered and refused for this magnificent horse.

If the Ford engine is to develop the full measure of speed and power that has been "built into" it, then the explosions of the four cylinders must be as accurately timed as the strides of the race horse. The Ford engine makes 2442 revolutions in high gear, while the car is traveling one mile. Since there are two working strokes in the engine, for each revolution, this means that there are 4884 working strokes per mile. As there are 5280 feet in a mile, then each "shot," or working stroke in the engine propels the car a distance of about 13 inches.

When we consider what short "steps" the Ford engine takes, even when the car is running in high gear, we begin to realize how quickly those steps must be made, and how accurately they must be timed, when the car is traveling at the reasonable speed of 30 miles an hour.

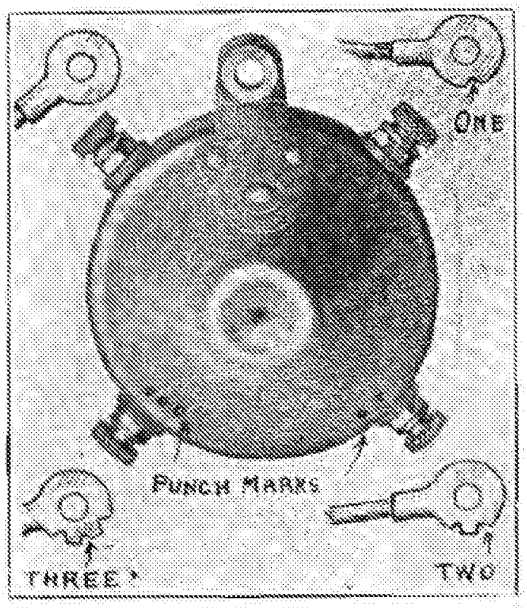
At this speed, there are 2442 "shots" per minute, or about 40 shots per second. This means that if the timer "hesitates" or delays, for even 1/40 of a second, that the engine will not fire at all. Even a delay of 1/100 of a second will mean that the engine will hardly run at all—to say nothing of running well. So, for really good running of the engine, it is necessary that the spark be accurately timed, within a limit of about 1/1000 of a second.

The blurred buzz of a hummingbird's wing is probably not so rapid as this, and it is hard to visualize so fine a measurement. As the thickness of th magazine page on which this is written is several thousands of an inch, we can compare this page with an inch board, and then we can begin to realise what a small fraction of a second the one-thousandth of a second really is.

Keeping in mind the necessity for accurate timing, so that the working strokes of all four cylinders shall push in harmony to ensure the steady rhythm of powdr of a smooth-running, powerful engine; we realize how important it is that there be no looseness or "play" in the bearings and parts of the roller brush assembly, and that the raceway on which the roller runs be kept clean and smooth, and free from "bumps."

Good Contact Needed

There are two kinds of electric current in the Ford ignition system. There is the "high-tension" current, flowing from the coil units to the spark plugs. This "high-tension" current, with its voltage of from 5,000 to 15,000 volts, thinks nothing of jumping across a little dirt, or a poor contact, or even through a half-inch or so of air. But, in the timer circuit, there is only the voltage of the Ford magneto. Theoretically, this is about 18 volts. Practically, we only get from 6 to 8 volts, or even less, when the engine is turned at slow cranking speeds.

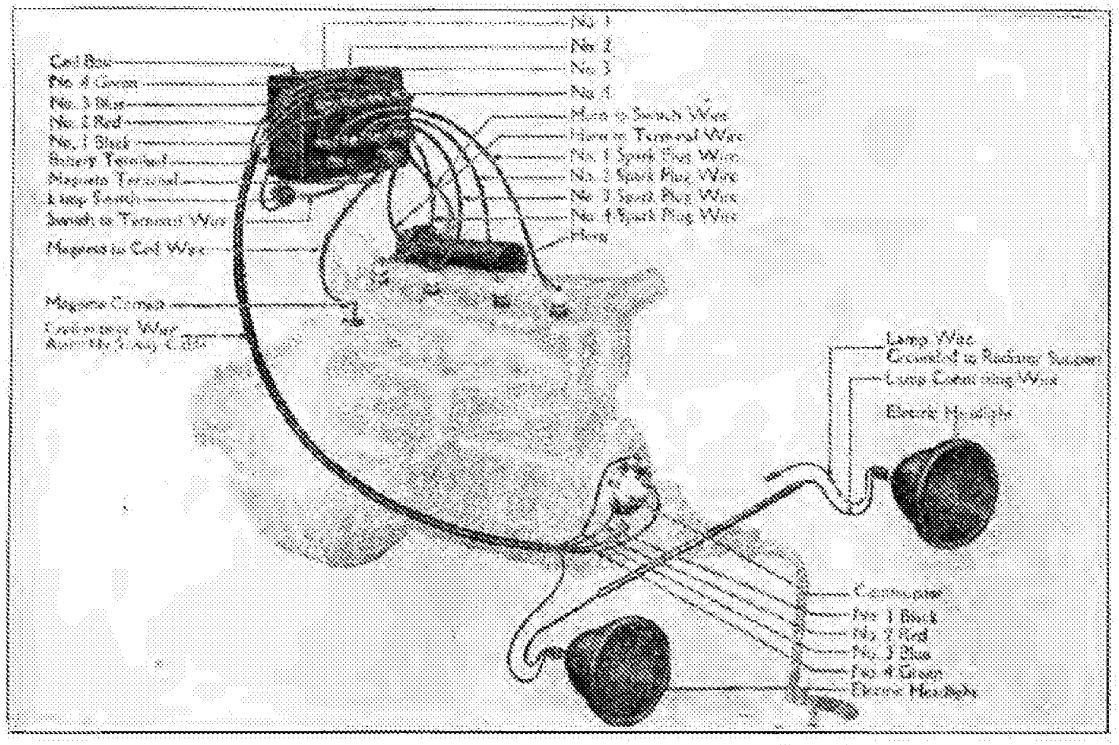


Identifies Wires.

Now, this 6 to 8 volts is barely sufficient to buzz the vibrators of the coil at best. But, if this current is impeded by a poor contact, between the roller and the segments, or by a poor contact between one of the wires and its binding post; then this weak current may be so decreased that the coils will not buzz at all, and so the engine will altogether fail to start.

The reason that the poor contact between the roller and the sgments is the chief cause of timer troubles in starting, is that trouble in one of the wires will only interfere with the firing of one cylinder. And if the other connections are right, the engine will start on the other three cylinders.

Since oil is an insulator of electric current, the presence of a film of oil or grease, between the contact segments and the roller, may keep the roller from making the absolutely essential "metal-to-metal" contact, which is needed to allow the current to flow through. Some forms of timers restrict the area of the contacting surfaces, so as to enable the roller to cut through more readily. Others use some form of whiping contacts, to wipe off the oil, while other timers are so built that no oil is needed for the lubrication of the working parts.



Wiring Diagram.

While oil-soaked commutator wires are often said to be the cause of "shorts" in the timer wiring, the statement is not precisely accurate. The fact is that oil tends to rot rubber, as we all know; and, when the rubber insulation is rotted, then it is easy for the metallic strands of wire to touch some part of the timer case and cause a "short."

To Oil, or Not to Oil.

The problem of oiling the timer is to lubricate the timer so that the parts may not wear too rapidly, and yet to keep the oil **off** the contact surfaces, so that good electrical contact will be secured. This means that the oil should be placed on the axle of the roller and on the pivot of the roller arm, and kept off the **surface** of the roller, if possible.

However, as all of these working parts are in the **same** case, it is not usually feasible to exercise any discrimination in oiling any particular parts. The custom is to just oil the timer in general, with the hope that the oil will reach the "working" parts, without insulating the roller from contact with the metal segments.

If a timer is properly lubricated, as directed in the Ford Manual, at least every two hundred miles or so, it is probable that the timer will last for several years before wearing out. However, owing to the inaccessibility of the oil cup on the timer shell, few car owners give the timer as frequent lubrication as it should receive, so that the average timer has to be replaced every year, and usually oftener, in order to make the engine run fairly smoothly and regularly.

Some car owners believe that the use of heavier oil makes starting so difficult that it is better to eliminate the use of oil **entirely**, and to replace the timer by a new one every four months or so. For winter use this practice has something to recommend it. But in the summer, the oil does not congeal in gum so easily, and it is generally better to give the timer more frequent lubrication, so that the timer will last a much longer time before requiring replacement.

Even under the best average circumstances, it will probably be advisable to replace the timer every five thousand miles, or for about six months of use. As it is foolish to mar the performance of an engine by a timer that is not in as good conditions as it should be.

For summer use, it is possible to use a **very light** or **thin** engine oil for lubricating the timer, provided that too much oil is not put in at one time. The oil already in the timer is usually so thin that it dilutes the fresh oil poured in, and so the oil does not prevent good contact from being secured.

If one pours in too much clean, fresh oil into the timer, after overhauling the timer, it is quite possible that trouble will be experienced in **starting** the engine, as this thick, heavy oil will prevent the roller from making contact with the segments, until a fairly high speed is reached. Then the **centrifugal** force will **add** the spring in pushing the roller against the segments and securing better contact. But, as soon as the engine slows down, it is apt to misfire and stop. For this reason it is often better to add a little bit of kerosene to the cylinder oil when refilling the timer, after having the timer off the engine for an overhauling and cleaning.

For the winter lubrication of the timer,

we have our choice of using no oil at all, or else of using a fifty-fifty mixture of kerosene and light engine oil. This kerosene thinned oil will not gum up so readily, and it is not so apt to prevent the roller from making good contact with the segments.

A good practice for winter lubrication is the use of 3-in-One oil, or of light, sewing-machine oil for the lubricttion of the timer. These oils are so thin and light that they are not apt to interfere with good electrical contact. Also, it might be added they are not apt to make as effective a lubricant as a heavier bodied oil.

Another method of timer lubrication involves packing the entire timer case with light grease. The reason that this grease does not seem to prevent easy starting in cold weather is that the roller brush assembly cuts a groove through the grease, and so the roller makes good contact even in the coldest weather. Some of our readers have recommended this practice, while our own experience with this method has not been altogether satisfactory.

Wiring Connections

The wiring connections of the Ford timer are a puzzle to many car owners, and even to some repairmen. The four wires leading from the coil box to the timer case, are differently colored, and this is intended as an aid in more easily identifying the wires and making the proper connections. However, as the ends of the wires near the timer soon become dirty and oil-soaked, so that they all have the same, dirty-black color, it is often difficult to tell "which-is-which" of the four wires near the commutator shell.

One way of making it easier to identify these different wires near the commutator, is to wrap these wires for about an inch, where they project through the end of the loom, with insulating tape. This insulating tape keeps the oil and dirt off the wires, so that the true colors of the wires may be more readily distinguished. By removing this tape, one can see which-is-which of the different timing wires connected to the binding posts on the timer shell.

We suggest to timer manufacturers that they paint different colored marks on the timer shell, adjacent to the binding posts, so that the car owner may more readily determine which wire goes to a particular contact. In one particular make of timer, the names of the colors of the different wires are stamped on the timer shell. This is very good practice indeed, when the timer shell is a casting, and when it is possible to stamp, or cast these names of the different colors in place.

It is also possible for the individual car owner, by using dabs of black, red, blue and green paint, adjacent to the terminals of the timer, to identify the timer terminals, so that the "black" wire can be attached to the contact point marked with "black" paint, and the "red" wire can be attached to the contact point marked with "red" paint, etc.

Another method of identifying the Ford timer connections is to file a notch in the edge of one of the wire loom terminals, and then to file or make two cuts with the hacksaw blade, in the next terminal, and three cuts in the third terminal, and either four cuts, or none, in the fourth terminal.

A center punch is now used to make one center-punch mark adjacent to the first terminal, and two center punch marks adjacent to the second terminal, etc. The wire terminal, with one notch, can be attached to the binding post which is marked with one center-punch mark and so on around the timer shell.

Instead of using center-punch marks, one could file nicks in the case, or make marks with the hacksaw. In using a center-punch, in marking the timer, one should use care in using the center punch, and not use so much force that the timer case is bent out of round. It is possible to make these marks effectual, yet without using enough force to destroy the timer case.

The advantage of these cuts, in marking the terminal and the timer shell, is that it is possible for one to distinguish the different terminals and to make the proper connections in the dark, in case that one has trouble with the timer on the road and no light is available.

Another method of identifying the wires at the timer end of the wire loom assembly, is to slip a short section of rubber hose, say an inch or two long, over the ends of the wires, where they project from the ends of the wire loom. By slipping this rubber sleeve forward a little, it is easy to uncover a clean section of the wires, and to distinguish which-is-which in the differently colored wires.

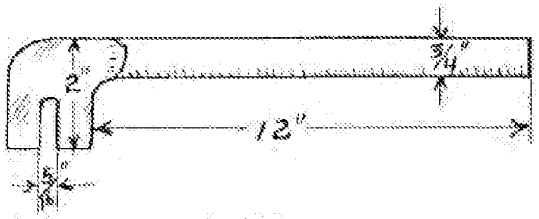
In case the wires are so dirty that one cannot tell the different colors, it is sometimes possible to cut back the loom covering for half an inch or so, or to pull the wires out of the loom for a short distance, so that the different colored wires can be distinguished.

If there are any short-circuits in these wires around the contact terminals, or where they come out of the end of the wire loom and rub against the chassis frame or against the carburetor priming rod, this is apt to cause one of the coil units to "buzz" all of the time, or whenever the contact is made. This will cause one or more of the cylinders to fire out of its proper order, and may cause that cylinder to back fire. Or, if the inlet valve is open, the flame will pass down through the inlet manifold and cause explosions in the carburetor.

When the engine "backfires" through the carburetor, short-circuit in the wire loom assembly, or somewhere around the timer connections, can be usually suspected, provided of course that the mixture supplied by the carburetor is not too weak, as that is another possible cause of "backfiring" through the carburetor.

In making the connections around the timer terminals, be careful that there are no stray strands of wire, or broken connections, which might touch against the timer shell or against the cylinder front cover plate, or even against the commutator pull rod. Not only must these wires and contacts be fully insulated in one position of the timer, but one must make certain that they will not touch any adjacent metal parts when the timer shell is moved to the fully advanced or fully retarded position.

Some careful car owners wrap insulating tape around both binding posts and the ends of the wire, after the connections have been made. But this precaution is hardly necessary, and requires longer time for replacing or repairing the timer, when this work becomes necessary. It is necessary, however, to tighten the knurled nuts sufficiently, so that



Timer Rod Bending Iron.

the timer terminals will not turn on the binding post, and touch against adjacent metal parts. In order to tighten these thumb nuts sufficiently, it is generally necessary to use pliers, as it is almost impossible to tighten them sufficiently with one's fingers.

Wiring Diagram

In the wiring diagram, which we show herewith, and which we suggest that you cut out of the magazine and paste under one of the seat cushions of the car, if you are not familiar with the Ford wiring system, it will be noticed that the right-hand side of the coil box is connected to the front or number one cylinder, the spark plug. Running from right to left, the second coil unit is connected to the second spark plug, the third coil unit to the third spark plug, and the coil unit at the extreme left-hand side is connected to the fourth cylinder, the cylinder which is towards the rear. This means that the four coil units are connected in 1-2-3-4 order to the four cylinders of the engine.

However, as the Ford engine fires in 1-4-3-2 order, this means that it is necessary to make a change in the primary wires so that the four cylinders of the engine will fire in the proper order, and that is why so much difficulty is experienced in connecting up the Ford timer case.

Referring to the Ford timer itself, we know that, when one faces the radiator, the starting crank and crank shaft rotate in a **clockwise** direction. As the crank shaft is geared to the cam shaft, this means that the cam shaft rotates in the **opposite**, or in a counter-clockwise direction.

If we take the lug on the timer shell, to which the commutator pull rod is attached, as a "point of location;" then the binding post to the left of this lug is usually considered as a number one binding post, which has the "black" wire and is connected to No. 1 coil unit, and to the spark plug to the front or No. 1 cylinder.

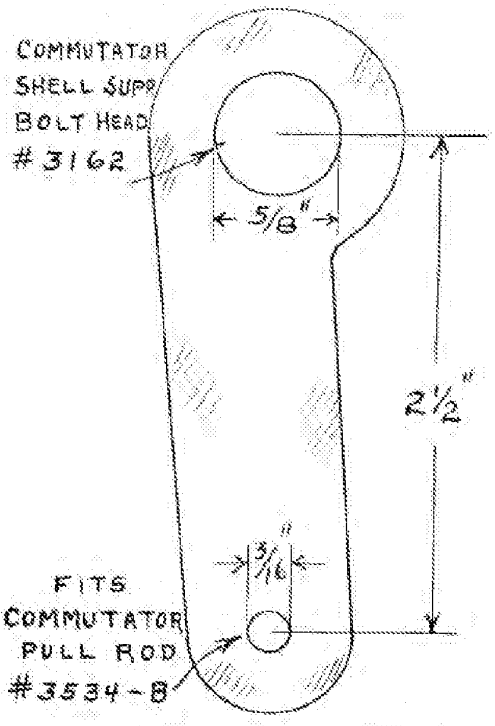
Proceeding around the commutator shell, as the roller brush assembly revolves, it will next touch the contact segment connected to the lower terminal, on the **carburetor** side of the engine. This is No. 2, or "red" wire of the commutator wire loom assembly. Proceeding around further, the next lower binding post, on the steering post side of the car, is No. 4 wire which is a "green" wire. Last of all, we come to the upper binding post, on the steering post side, which is the "blue" wire and fires the fourth or rear cylinder.

We thus discover that the **transposed wires** are those connected for the two rear cylinders. And this is the part to be careful with, when making the connections at the commutator end of the wiring assembly. At the coil box end of the wire loom assembly, the wires are connected in regular 1-2-3-4 order.

Another method, of replacing the timer shell assembly, is to remove but one wire at a time from the old time case, and to replace the wires on the newtimer shell in **precisely** the same order as the wires were removed.

Setting the Spark Advance

If the spark advance is not correctly set, or in other words if the angular position of



Full Size Gauge for Adjusting Timer.

the timer shell, with relation to the cam shaft is not correct, then the spark will occur either too late or too early, with regard to a certain position of the spark lever control on the steering column.

While it might be thought that any inaccuracy of the timer setting could be corrected by moving the spark lever more or less, still this is not good practice. The Ford timer requires all the spark advance and retard which can be obtained when the timer case is set in **precisely** the correct position, so that if the timer is not set in the correct position, it will not be possible to secure all the advance or retard which is sometimes needed for the **best** operation of the engine.

Furthermore, it is desirable to have the

timer set in a certain **standard** position, so that when repairmen or others, not familiar with a particular car, are driving or testing the engine; then they will be able to start the engine without breaking an arm or doing damage to the electric starting system. For this reason, **a standardized** spark advance has been adopted, and should be used by each and every individual car owner and repairman.



Setting Timer.

The **standard** spark advance, or commutator setting, as adopted by the Ford Motor Company, is now 2½ inches. This is the center-to-center distance between the end of the commutator pull rod, where it projects through the lug on the timer shell, and the head of the bolt, which holds the commutator retaining spring in place.

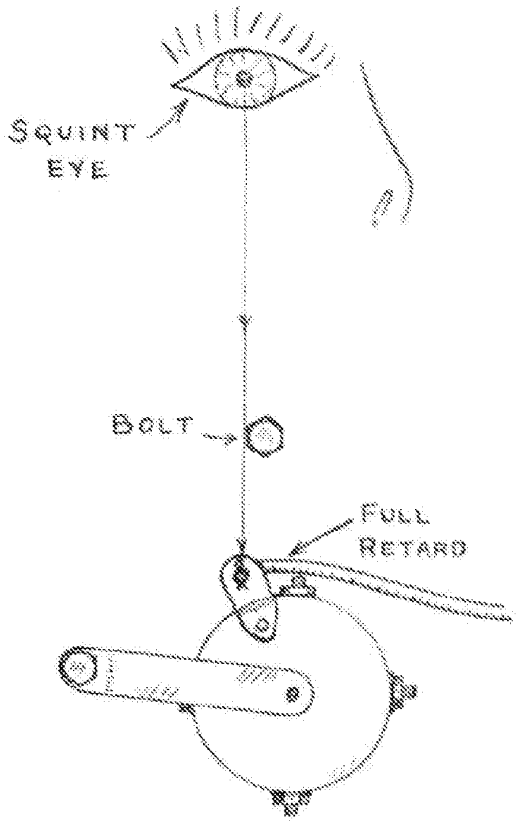
Several years ago, in an earlier article on this subject, we advocated the use of a standard distance of 2⅝ inches. But with the installation of the Ford electric starting and lighting system, it was found that 2⅝ inches sometimes caused the engine to kick back when starting on battery current. And so for safety's sake, this 2⅝ inch has been reduced to 2½ inches and we now recommend that this distance be used.

When making this adjustment, the timer case should be set by the spark lever on the steering column, so that "end-play" or lost motion in the different connections be taken out.

Some of the results of a poorly adjusted spark, are an overheated engine, burned valves, a knocking engine, or perhaps a broken arm or damage to the electric starting motor.

Before adjusting the spark advance, one should turn the socket of the universal ball joint, on the end of the commutator pull rod, as tightly as possible. While some car owners try to adjust the length of the commutator pull rod by **partially** unscrewing the ball joint from the end of the rod, we do not advocate this practice, as this is apt to result in a loose and "wobbly" connection between the ball joint and the threaded end of the rod.

When the ball joint is only held on the end of the rod by a few threads, then this is apt to wear the threads on the end of the rod and in the socket, so that a wobbly connection and looseness and "play" will exist at this point. Then the driver does not have as accurate control of the spark advance as he should. Also, the threads are apt to wear, and the ball joint may pull off the end of the rod, leaving the spark advanced, so that the motor will back fire, and possibly injure the driver, the next time the engine is cranked.



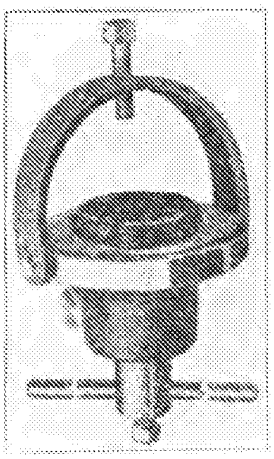
Squint Eye Method.

We advise securing this socket as firmly on the end of the rod as possible, thus making a practically solid joint at this point. And then making the adjustment in the **variation** of the length of the commutator pull rod by **bending** the commutator pull rod. The commutator pull rod can be **bent** by the careful use of a monkey wrench, and this method is advised for the use of individual car owners. Repairmen usually find it advisable to make a special bending bar, of the dimensions given in our sketch, as this allows the commutator pull rod to be bent more quickly and correctly. This tool is usually called a bending iron.

Timer Adjusting Gauge

In order to make a gauge for adjusting the timer, a sheet metal gauge can be cut from thin piece of steel. Our sketch shows the dimensions, and can be used as paper pattern, and pasted on the sheet metal, and then the gauge cut out. For the **occasional** use of a car owner, such a gauge can be made of

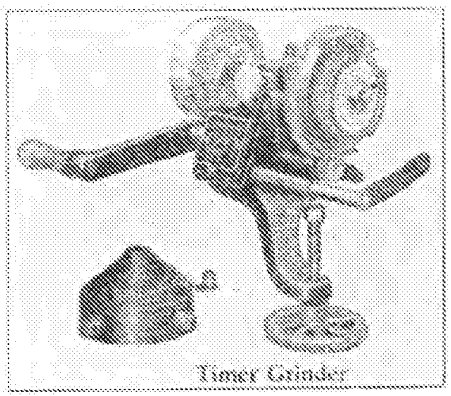
heavy cardboard, and will be sufficiently accurate for the purpose if a new gauge is made each time the timer is adjusted. However, for regular use, the sheet metal gauge is far better.



Inland Timer Refacer.

The actual dimensions of this gauge are given,so that the gauge can be laid out directly on the metal, if one does not wish to mutilate the pages of this magazine. Many car owners and dealers keep this magazine for permanent reference, and to preserve an article of this kind, without destroying the pages of the magazine.

The commutator retaining spring is held in place by a long ⅝ inch diameter bolt, which passes through the oil filler opening of the cylinder front cover plate. The large opening in the gauge is intended to fit over the hexagonal head of the bolt, so that it is



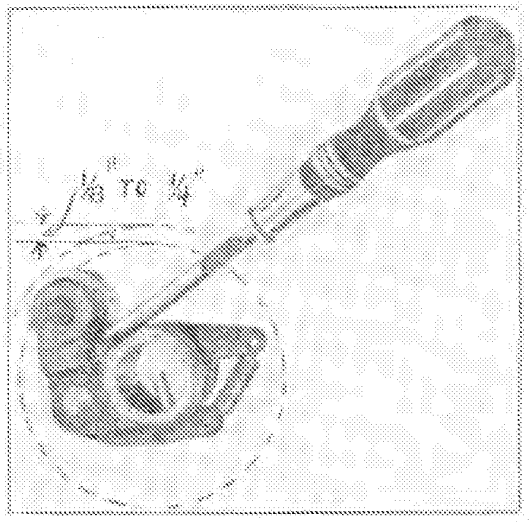
not necessary to even loosen the bolt when applying the gauge.

This gauge is intended to be used with the spark lever in the **fully** retarded position, the commutator being placed in this position by moving the spark lever on the steering column. With the large opening slipped over the head of the bolt, the **small** opening in the other end of the gauge just slips over the end of the commutator pull rod—or else the commutator pull rod should be bent until it does.

Squint-Eye Method

A rough-and-ready method of verifying the setting of the timer is used by one good repairman and which he calls the "Squint-Eye" method. It will be noticed, by referring to the sketch, that the object which might be taken for the rising sun, at the top of the drawing is supposed to represent the human eye. As there is only one eye shown, this eye is not cross-eyed, and the eye may be either black, or blue, or green, or yellow, and almost anything but closed, and still give very good results.

In using this method, the operator stands boldly in front of the radiator, with the hood removed from over the engine, and glares down past the bolt on which the fan bracket arm is pivoted. By looking **vertically** down past the edge of this bolt, at the end of the commutator pull rod, with the spark lever in the **fully retarded** position, these parts should line up exactly. This method is useful to the



Bends Roller Arm.

foreman of a repair shop, in checking over the adjustment of every car, before it goes out of the shop. It is also a useful method for use on the road, when more elaborate methods are not available.

Repairing Worn Timers

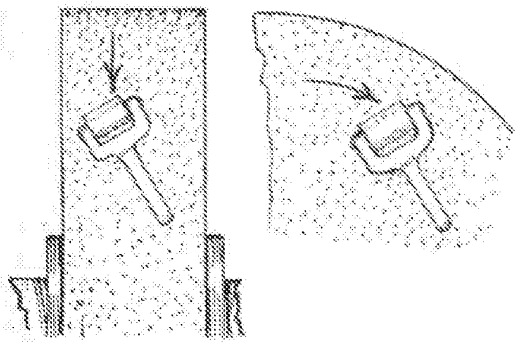
While it is the custom of most car owners and repairmen to simply discard all worn timers and parts which show signs of wear, it seems to us that this is a rather wasteful custom, which worked well enough in the hurry and scurry of war time rush, but will not be used so much now that things are settling back to normal, and more time is available for saving parts. When time was everything, it paid to discard parts, but now that time is not so precious—better service will be obtained by salvaging perfectly good parts.

If the race-way or path on which the commutator roller runs is not smooth and level, then the roller will vibrate and jump. This jumpy action of the roller will cause **partial** misfiring of the engine, even though it does not cause the engine to misfire altogether.

Or maybe cause the engine to fire late at times, and then the engine will not develop its full power and speed. Trouble with a rough commutator shell is usually most in evidence in higher speeds of the engine, and means wasted gasoline and more carbon in the cylinders, and an overheating engine as well as lack of speed and power.

A slight improvement can sometimes be made in a worn timer shell by tightening the nuts which hold the steel contact segments in place, thus drawing these segments farther down into the insulation and making them come more evenly with the insulation. The softer fibre insulation usually wears more rapidly than the hardened steel of the contact segments.

Some skilful mechanics can place a timer shell on the lathe and true out the inside surface of the timer, and make the inside of the timer practically as smooth and true as when new. But it requires a good mechanic to center the timer shell accurately and to obtain good results, because if the work is not skillfully done, the cutting tool is apt to catch and chatter, while working on the uneven surface. The lathe tool tends to catch on the edges of the steel segments and then chatters and digs into the softer fibre insulating material, thus making a rough and sagged cut.



Grinding the Roller.

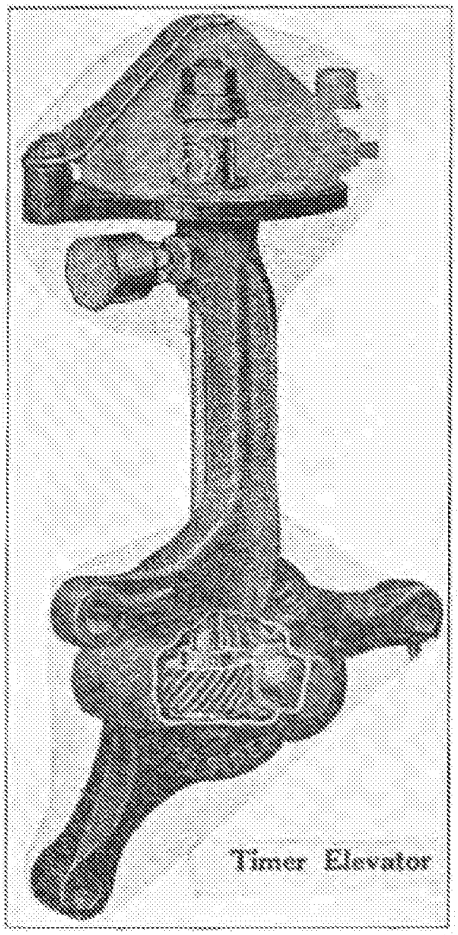
The trouble with this method is that the lathe is not often used in Ford repair shops, as most of Ford repair shop work is replacement work, and so a lathe is not generally available.

A satisfactory tool for this work of refacing timers is called the Inland timer refacing tool and is, in a sense, a small portable lathe, specially adapted for this particular work. With such a tool, the timer shell can be refaced rapidly, insuring perfect roller contact at all times.

This tool is provided with an automatic feed, which means that the race-way will be cut true and even, across the entire surface. The automatic feed is provided with a quick return, to save the time of the repairman when truing up timers. And there is a sensitive cutting adjustment, which makes it possible to finish the surface smoothly, without removing the timer shell from the tool.

There are few details in the handling of this tool which require attention, in order that the best results may be secured, the first detail being to tighten the nuts holding the metal contact segments to the shell, so that these contact segments will not jump and chatter as the edge of the cutting tool digs into them.

The high spots of the metal and fiber are "roughed" by using a light cut, and finally a "finishing" cut is taken by just turning the adjusting screw about ⅛ of a turn. These operations are repeated, until the cutting tool is found to cut smoothly around the entire circumference of the race-way. Then the cutter should be run through again, without changing the adjustment of the cutting edge. This forms a finishing cut, for surfacing the timer shell.



If the race-way is unusually rough, it is sometimes advisable to remove the timer case and dump out the metal chips, before making the finishing cut, as otherwise these metal chips may dig into, and roughen up the surface of the race-way. A liberal supply of oil, inserted through the oil hole in the body of the cutting bar, assists the cutting edge in applying a fine "machine-finish" on the race-way of the commutator shell.

After this race-way has been "machine-finished," it should be polished with fine emery cloth or sandpaper. Care should be taken to wipe out all metal chips from the timing shell, before replacing the timer on the engine.

Timer Grinder.

Another method of refacing the commutator shell consists in a special timer grinder, having an emery wheel somewhat smaller than the inside of the Ford commutator shell. This timer grinder is fitted with a special chuck which requires no skill in centering the commutator shell on the grinder. When this grinding tool is in use, the grinding wheel revolves inside of the timer shell at a high rate of speed, while the chuck and timer are slowly and steadily rotated round the grinding wheel equally and smoothly, so that even a badly worn timer can usually be trued up as good as new in a very few minutes.

Grinding the Roller.

It is equally important to have a smooth and accurately finished roller on the roller brush assembly, as it is to have a smooth, true surface on the timer shell itself. When the timer case becomes rough, the roller usually becomes badly worn also, as the wear on the roller is concentrated over a smaller surface than the inside of the timer itself.

This generally means that the roller brush assembly has to be more frequently replaced than the timer shell. As the roller brush assembly only costs about one third as much as the timer shell, this is not a catastrophe. But there is no necessity, in many cases, for purchasing a new roller brush assembly, when a worn brush is the only defect.

As one of our readers so cleverly suggested in our Hints Department, it is comparatively easy to true up the rollers by holding the roller brush assembly at an angle with the oil stone, and showing the roller slantiwise so that roller grinds as it turns on the oil stone. Of course, the roller brush assembly can be smoothed more rapidly on the surface of an emery wheel or grindstone. But then it may be advisable to give the roller surface a final finish and polish, on a fine oil stone, or on a fine grade of sandpaper.

This truing and grinding of the roller can be accomplished on either the face, or the side of the emery wheel. In many cases, the rim or edge, of the emery wheel is grooved and rough, so that better results can often be obtained by holding the roller brush assembly against the side of the revolving wheel, at a slight angle as shown in our drawing. Under these conditions the roller will revolve rapidly as it is scraped and ground on the surface of the stone, and a good, true result can easily be secured in this manner.

If Ford car owners would true up their timers every month or two, both roller brush assembly and timer shells, they would obtain much better results, both as to smoothness and power of the engine and efficiency of fuel, than they now do.

The question has been raised as to whether refacing these timers will so increase the inside diameter of the timer shell that the roller brush assembly will no longer make good contact with the contact segments. This objection can be easily overcome by inserting the blade of a screw driver between the roller and the hub of the roller brush assembly, and prying outwardly, thus bending at the arm for 1-16 to ⅛ of an inch, and securing ample range of contact for even the most badly worn timers, after they have been refaced.

As a matter of fact, Ford cars sometimes give trouble with poor contact, even with brand new timer shells. Then this same method of bending out the roller arm can be used. In one case, where a Ford car gave persistent trouble with overheating, this trouble was finally located as being due to poor contact between the roller and the contact segments, and the trouble was overcome by bending out the arm of the roller brush assembly in the manner in which we have described.

Timer Elevators.

Another improvement, in Ford timer accessories, is the Ford timer elevator to bring the Ford timer up out of the dirt-and-darkness, between the front end of the engine and the radiator, into the broad light of day. There are about five different makes of these timer elevators now on the market, these elevators differing in details of construction and design.

In the Thomas timer elevator, there is a set of spiral gears at right angles to each other, which transmit the driving power from the cam shaft to the vertical shaft, at the top end of which the timer assembly is placed. As the only friction tending to hold back the roller brush assembly is that existing between the roller and the race-way of the timer shell, there is very little power indeed transmitted through these gears. And they should last almost indifferently without wearing or causing trouble. As more or less oil usually leaks out into the casing surrounding these gears from the front end of the camshaft, these gears are adequately lubricated and due to their spiral construction they will cause practically no noise when in action.

The use of one of these timer elevators protects the timer itself from oil and dirt and water, and is effective in securing easier starting, because the vertical position of the race-way of the timer makes the oil run off more easily, so that the oil does not collect between the roller brush assembly and the contact segments. The use of one of these timer elevators allows an overhead wiring system running along the radiator to dash rod to be used.

Ford Facts & Figures

Motor Numbers Tell When Each Ford Car and Truck Was Made. Also Includes Canadian Fords and General Specifications.

By Ed. Technical

As we are continually adding to our new readers, the subject of "motor numbers" and when Ford cars were made, becomes of keen interest when buying or selling Fords, or when applying for licenses. And as the Ford Motor Company keeps "grinding them out" at the rate of a million a year; we have found it necessary to publish a new and revised birthday list, together with extensive additions.

As the material in our previous Ford Birthday Party was copied into several books and by several magazines; we have realized our responsibility as the "recognized authority, and have checked over these motor numbers very carefully indeed.

Our first list of Ford motor numbers, as published in the May 1918 issue, has stood the test of many years of use by Ford car owners and agents everywhere. Questions have arisen— but have been satisfactorily answered—and the list has stood pat.

We give the complete lists, for the convenience of those who buy and sell Fords, as well as for the use of those who sometimes need to know the exact age of a Ford, when ordering parts. As every owner of a Ford sells his car at some time or other, this makes the list valuable to almost anybody.

Save This Issue.

We advise you to save this issue, because you are apt to need it at some future time. If you have occasion to sell your Ford car or Fordson tractor, this list will make it easy to convince the prospective buyer as to when the car was actually built. If you ever have an opportunity of buying a used Ford or tractor, this list will be even more valuable, as it will make it easy to ascertain just when the car or tractor was actually built. Thus verifying the seller's veracity, as well as obtaining exact data.

The "motor number" is stamped onto the side of the cylinder block, right over the side water inlet hose connection. On some of the very early Fords, made in 1910 or so; the motor numbers were stamped down near the breather, or oil filler pipe. But nearly all these very early Fords have had the cylinder blocks replaced by this time, so nearly every Ford now in use carries the number in the same place, right over the side hose connection.

When the cylinder block is replaced by a new one, the same motor number should be stamped on the new cylinder block as was stamped on the old block. Thus each car retains the same motor number, from the assembly line to the junk-yard, irrespective of how often the different components of the car have been replaced.

As one can buy a complete Ford engine and transmission assembly for $135 in exchange change for the old engine; some owners of old Fords install new engines. And the new engine should have the same number stamped on the block that appeared on the old engine.

The Ford Motor Company does not have any spare motor numbers so that the only safe way is to use the same motor number right along, and so keep out of trouble. If you build up a Ford out of "scrapped" parts, as some repairmen do; then this car should be listed as a "special", under the name of the repairman as manufacturer. It should not be given a Ford motor number, as it has no factory birth-right.

If the same motor number is not stamped on the new block or new engine, then one may have difficulty in selling the car at some future time. No intelligent buyer will take a car without a "motor number", as he knows that he will have difficulty in securing a state license; and that he may get into trouble with the police, who may think the car a stolen one.

Replacing the engine may seem like replacing the car, but it is the car and not the engine which is licensed by the state. The motor number is also the "car number", and is the only number that distinguishes one Ford from another, as far as the factory is concerned.

Car Serial Numbers.

Some of the earlier Ford cars, made from 1912 to 1915, had a "serial", or car number, stamped on a metal plate attached to the dash. But most of these old-style bodies have now been changed, and little attention is now paid to these car numbers. However, for insurance adjusters or police departments who need this additional "check-up" on stolen Fords, we give this serial list.

Date	Car Number
Oct. 1, 1912-Sept. 30, 1913	150,001-332,500
Oct. 1, 1913-July 31, 1914	332,501-539,000
Aug. 1, 1914-April 30, 1915	539,001-742,313

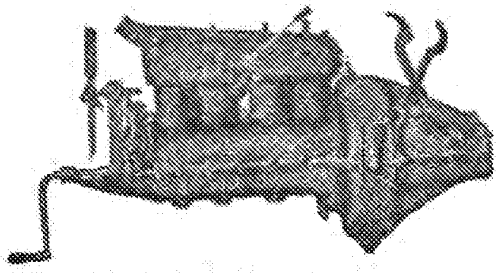
On some Ford engine numbers, a letter is prefixed to the motor number. When the "C-numbers" are used, this means that the Ford car was built in Canada. These are the "overseas" Fords, that are shipped to foreign countries in all parts of the world.

B-Numbers.

The "B-numbers" Fords, were built at the factory in Detroit, and Ford cars with motor numbers B-1 to B-12,247 were built between October 1, 1912 and September 30, 1913.

A little more care in looking up the "past" of used Fords, that are offered for sale at bargain prices or by strangers, would do much to reduce the stealing of Ford cars from which we all suffer, either directly, or by paying higher premiums for theft insurance.

Do not "make up" fictitious motor number, as this is dishonest and steals the number



Location of Motor Number

belonging to some other Ford car owner. If a Ford with an incorrect motor is sold, then the buyer has a fine chance to make a fool out of the one who sold it, as the evidence will tend to indicate that the motor number was altered with fraudulent intent to deceive.

Early Ford Cars.

The famous Model T. Fords are the ones on which production has been concentrated since October 1, 1908. But before the Model T. was built, there were several early models, beginning with the 2-cylinder, chain-drive Model A, up to the better known Models N. S. and R, concerning which we sometimes hear from our readers.

While in 1908, the Ford factory only built 6,398 cars, it now builds over 4,000 per day —which is almost as many per day now as were formerly built in a year. Yet the owners of these early Fords are still being taken care of, and it is still possible to purchase parts for these early Fords. That's Henry Ford's idea of service!

The fact that there are no "orphans" in the Ford family now, is splendid evidence that those who buy new Fords will be just as faithfully taken care of. Past performance is a fine guarantee of future good faith.

Dates on Castings.

Like a woman's "No!", the dates on such castings as the cylinder head and cylinder block do not mean much. These dates only show when the block is cast. Since a cylinder block is improved by "ageing" or being allowed to settle for several months to allow the casting strains to become equalized before machining; this means that an engine is ever better, if the casting date is several months earlier than the motor number.

When the car is a "used" Ford, it is not safe to pay much attention to the date cast on the cylinder block. The cylinder block of an early Ford may have been replaced by a 1919 or 1920 block. Then the cast iron figures will indicate that the car is much newer than it really is, as proven by the honest motor number.

If the motor number does not agree with this list, it is possible that the motor number may have been changed by placing a "1" or some other digit in front of the true motor number; thus making the car appear to be much newer than it really is. Or a "6" is sometimes changed to an "8", or the numbers may be filled up and new numbers stamped on.

Do not place too much reliance on the motor number, for, while it is good evidence, still it is not conclusive evidence. If there is any suspicion that the "motor number" has been altered, we suggest that the seller be asked to produce the "Buyer's Order and Agreement" showing the date of purchase from the Ford Motor Company. Or else you should write to the State Highway Commissioner, asking for facts concerning the car. Or refer to the records of the local Ford Agent or Factory Branch. Honest sellers of used Fords are glad to be investigated—it is the rascals who cannot stand it. An altered motor number makes the car an outcast and its owner an object of suspicion wherever he goes.

Production of Ford Cars.

The Ford Motor Company was organized June 16, 1903. The list below includes the earlier Ford models; as well as the present Model T Fords, made since 1908.

Ford cars			
1903	1,708	1913	168,226
1905	1,695	1914	248,307
1906	1,599	1915	308,213
1907	8,423	1916	533,921
1908	6,398	1917	751,287
1909	10,607	1918	642,750
1910	18,664	1919	821,600
1911	34,528	1920	945,508
1912	78,440	1921	989,785

NOTE—The above production figures refer to the Ford fiscal year, commencing August first. And while the Ford Motor Company has not produced a million in a fiscal year—still the million-a-year mark was actually passed in 1920 when 1,038,450 cars were built from January 1, 1920 to December 31, 1920.

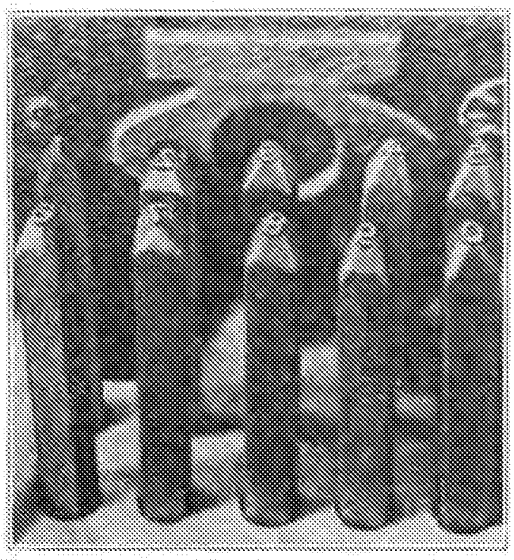
Made in Millions.

The Ford car is the only automobile that has ever been "made in millions." It is interesting to notice that Ford with motor number 1,000,000 was made on December 10, 1915. Ford with motor number 2,000,000 was made on June 14, 1917. While the Ford with motor number 3,000,000 was started on "the long trail" in April 1919. The motor number of 4,000,000 was given to a Ford car built in May 1920. While Edsel Ford has retained for his own use the Ford with 5,000,000 motor number, as built in May 1921. By the time this article is published, the 6,000,000 Ford will be "passing them on the hills."

Our list of motor numbers only gives the numbers of the Model T. Fords.

	Motor Number			Cars Built
1908				
Oct. 1-31	1	to	11	11
Nov. 1-30	11	to	101	90
Dec. 1-31	101	to	309	208
1909				
Jan. 1-31	309	to	648	335
Feb. 1-28	648	to	1052	406
Mar. 1-31	1052	to	2025	973
Apr. 1-30	2025	to	2691	666
May 1-31	2691	to	4036	1345
June 1-30	4036	to	5980	1944
July 1-31	5980	to	8107	2127
Aug. 1-31	8107	to	9840	1733
Sept. 1-30	9840	to	11148	1308
Oct. 1-31	11148	to	12405	1257
Nov. 1-30	12405	to	13132	727
Dec. 1-31	13132	to	14161	1029
1910.				
Jan. 1-31	14161	to	15500	1339
Feb. 1-28	15500	to	16600	1100
Mar. 1-31	16600	to	19700	3100
Apr. 1-30	19700	to	23100	3400
May 1-31	23100	to	26800	3400
June 1-30	26500	to	29500	3000
July 1-31	29500	to	30200	700
Aug. 1-31	30200	to	31000	800
Sept. 1-30	31000	to	31900	900
Oct. 1-31	31900	to	32500	600
Nov. 1-30	32500	to	33700	1200
Dec. 1-31	33700	to	34900	1200
1911				
Jan.1-31	34900	to	37000	2100
Feb. 1-28	37000	to	40000	3000
Mar. 1-31	40000	to	45000	5000
Apr. 1-30	45000	to	50800	5800
May 1-31	50800	to	57200	6400
June 1-30	57200	to	60500	3300
July 1-31	60500	to	62100	1600
Aug. 1-31	62100	to	66700	4100
Sept. 1-30	66700	to	70500	3800
Oct. 1-31	70500	to	83100	12600
Nov. 1-30	83100	to	86300	3200
Dec. 1-31	86300	to	88900	2600
1912				
Jan. 1-31	88900	to	92000	3100
Feb. 1-29	92000	to	95900	3900
Mar. 1-31	95900	to	103800	7900
Apr. 1-30	103800	to	113900	9100
May 1-31	112900	to	123800	10900
June 1-30	123800	to	132000	8200
July 1-31	132000	to	139700	7700
Aug. 1-31	139700	to	144500	4800
Sept. 1-30	144500	to	147300	2800
Oct. 1-31	147300	to	156300	9000
Nov. 1-30	156300	to	161200	4900
Dec. 1-31	161200	to	171300	10100
1913				
Jan. 1-31	171300	to	186900	15600
Feb. 1-28	186900	to	203300	16400
Mar. 1-31	203300	to	218900	15600
April 1-30	218900	to	242300	23400
May 1-31	242300	to	260000	17700
June 1-30	260000	to	282700	22700
July 1-31	282700	to	298200	5500
Aug. 1-31	298200	to	306800	8600
Sept. 1-30	306800	to	314800	8000
Oct. 1-31	314800	to	324900	10100
Nov. 1-30	324900	to	344900	20000
Dec. 1-31	344900	to	370400	25500

	Motor Number			Cars Built
1914				
Jan. 1-31	370400	to	395500	25100
Feb. 1-28	395500	to	419300	24000
Mar. 1-31	419500	to	447600	28100
Apr. 1-30	447600	to	473200	25600
May 1-31	473200	to	490920	17720
June 1-30	490929	to	507102	16182
July 1-31	507102	to	517800	10698
Aug. 1-31	517800	to	538200	20400
Sept. 1-30	538200	to	558300	20100
Oct. 1-31	558300	to	583400	25100
Nov. 1-30	583400	to	599100	15700
Dec. 1-31	599100	to	611100	2100
1915				
Jan. 1-31	611100	to	614200	3100
Feb. 1-28	614200	to	630500	16200
Mar. 1-31	630500	to	682400	51900
April 1-30	682400	to	723500	41100
May 1-31	723500	to	805500	82000
June 1-30	805500	to	839700	34200
July 1-31	839700	to	855500	15800
Aug. 1-31	855500	to	881000	2600
Sept. 1-30	881000	to	913000	32000
Oct. 1-31	913000	to	949000	36000
Nov. 1-30	949000	to	985400	36000
Dec. 1-31	985400	to	1029200	43800



Stamps for Motor Numbers

1916				
Jan. 1-31	1029200	to	1071800	42600
Feb. 1-29	1071800	to	1119000	47200
Mar. 1-31	1119000	to	1167900	48900
Apr. 1-30	1167900	to	1219400	51500
May 1-31	1219400	to	1272000	52600
June 1-30	1272000	to	1326900	54900
July 1-31	1326900	to	1362213	35313
August 1-31	1362213	to	1400900	38687
Sep. 1-30	1400900	to	1452200	51300
Oct. 1-31	1452200	to	1510500	58300
Nov. 1-30	1510500	to	1570700	60200
Dec. 1-31	1570700	to	1614000	43300
1917				
Jan. 1-31	1614600	to	1680000	65400
Feb. 1-28	1680000	to	1739900	49900
Mar. 1-31	1739900	to	1812000	72100
Apr. 1-30	1812000	to	1888000	76000
May 1-31	1888000	to	1968629	80629
June 1-30	1968629	to	2044100	75471

	Motor Number			Cars Built
July 1-31	2044100	to	2113500	69400
Aug. 1-31	2113500	to	2162800	49300
Sept. 1-30	2162800	to	2231000	68200
Oct. 1-31	2231000	to	2310400	79400
Nov. 1-30	2310400	to	2383900	73500
Dec. 1-31	2383900	to	2449100	65200
1918				
Jan. 1-31	2449100	to	2503200	54100
Feb. 1-28	2503200	to	2558200	55000
Mar. 1-31	2558200	to	2611400	53200
Apr. 1-30	2611400	to	2657500	46100
May 1-31	2657500	to	2700800	43300
June 1-30	2700800	to	2735700	34900
July 1-31	2735700	to	2756251	56451
Aug. 1-31	2756250	to	2774600	18349
Sept. 1-30	2774600	to	2787800	13200
Oct. 1-31	2787800	to	2792300	4500
Nov. 1-30	2792300	to	2805100	12800
Dec. 1-31	2805100	to	2831400	26300
1919				
Jan. 1-31	2831400	to	2880170	48770
Feb. 1-28	2880170	to	2933000	52830
Mar. 1-31	2933000	to	2997100	64100
Apr. 1-30	2997100	to	3067700	70600
May 1-31	3067700	to	3140000	72300
June 1-30	3140000	to	3210800	70800
July 1-31	3210800	to	3277850	67050
Aug. 1-31	3277850	to	3346900	69050
Sept. 1-30	3346900	to	3429400	82500
Oct. 1-31	3429400	to	3515430	86030
Nov. 1-30	3515430	to	3588000	72570
Dec. 1-31	3588000	to	3659970	71970
1920				
Jan. 1-31	3659970	to	3743075	83105
Feb. 1-29	3743075	to	3817430	74355
Mar. 1-31	3817431	to	3910000	92569
Apr. 1-30	3910001	to	3969150	59149
May 1-31	3969151	to	4055280	86129
June 1-30	4055281	to	4141450	86169
July 1-31	4141450	to	4233350	91900
Aug. 1-31	4233351	to	4329900	96549
Sept. 1-30	4329901	to	4426385	96484
Oct. 1-31	4426286	to	4526540	100154
Nov. 1-30	4526541	to	4617925	91384
Dec. 1-31	4617926	to	4698420	80584
1921				
Jan. 1-31	none			
Feb. 1-28	4698416	to	4736431	38,015
Mar. 1-31	4736432	to	4810010	73,578
Apr. 1-30	4810011	to	4907500	97489
May 1-30	4907501	to	5008000	100499
June 1-30	5008001	to	5114530	106530
July 1-31	5114531	to	5223135	108604
Aug. 1-31	5223136	to	5337545	114409
Sept. 1-30	5337546	to	5447816	110270
Oct. 1-31	5447816	to	5529519	81703
Nov. 1-30	5529520	to	5602301	72781
Dec. 1-31	5602302	to	5638071	35769
1922				
Jan. 1-31	5638072	to	5683808	45736
Feb. 1-28	5684809	to	5737278	52469
Mar. 1-31	5737279	to	?	

Fuel Tank Measurements.

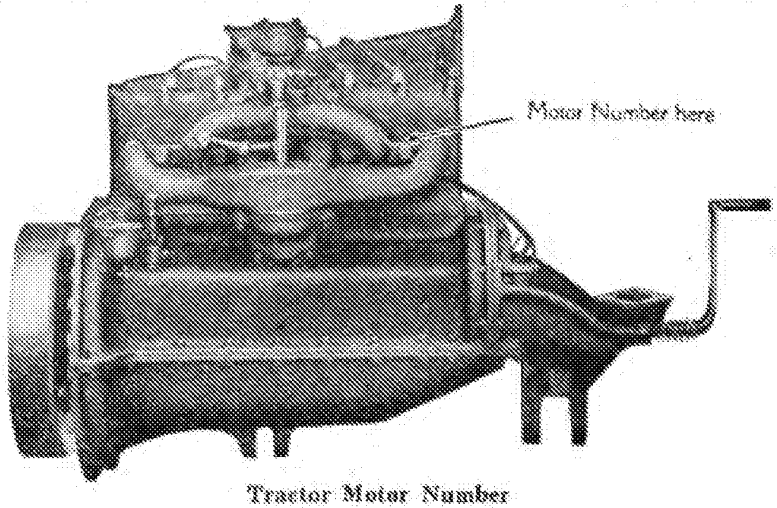
The old "round" gasoline tanks, as used on all Fords for many years, were of approximately 10 gallons capacity. These tanks were used on all touring and roadsters of earlier than 1920 make, and even on some of the 1920 models. With these round tanks, it will be noticed that one gallon, at the bottom of the tank, takes more than twice as much depth as a gallon near the middle.

As the Ford Motor Company wished to fit a new and lower type of body on the Ford touring cars made on and after August of the 1922 model, they started installing "elliptical" or oval tanks on Ford cars.

While the Ford Motor Company did not bring out the new bodies until the 1922 models; the elliptical tanks were started through much earlier, these "oval" tanks being adopted to fit under the lower seat cushions of the new Ford bodies.

The oval tanks are now used on all Ford models, with the exception of the Sedan. And the capacity of this oval tank may be roughly estimated as 1-½ inches for the first gallon, and ⅝ inch for each additional gallon up to nine.

The "square" tank is now used on Ford Sedans, but was also used on many of the earlier Ford Coupes. With the square tank, each ⅝ inch represents one gallon.



Tractor Motor Number

	Motor Number			Cars Built
July 1-31	2344100	to	2113500	69400
Aug. 1-31	2113500	to	2162800	49300
Sept. 1-30	2162800	to	2231900	69200
Oct. 1-31	2231900	to	2310400	78500
Nov. 1-30	2310400	to	2383900	73500
Dec. 1-31	2383900	to	2449100	65200
	1918			
Jan. 1-31	2449100	to	2503300	54100
Feb. 1-28	2503300	to	2558300	55000
Mar. 1-31	2558300	to	2611400	53200
Apr. 1-30	2611400	to	2657500	46100
May 1-31	2657500	to	2700300	42800
June 1-30	2700300	to	2735700	34900
July 1-31	2735700	to	2756251	55451
Aug. 1-31	2756250	to	2774500	18349
Sept. 1-30	2774600	to	2787800	13200
Oct. 1-31	2787500	to	2792300	4500
Nov. 1-30	2792300	to	2805100	12800
Dec. 1-31	2805100	to	2831400	26300
	1919			
Jan. 1-31	2831400	to	2880170	48770
Feb. 1-28	2880170	to	2933000	52830
Mar. 1-31	2933000	to	2997100	64100
Apr. 1-30	2997100	to	3067700	70600
May 1-31	3067700	to	3140000	72300
June 1-30	3140000	to	3210800	70800
July 1-31	3210800	to	3277850	67050

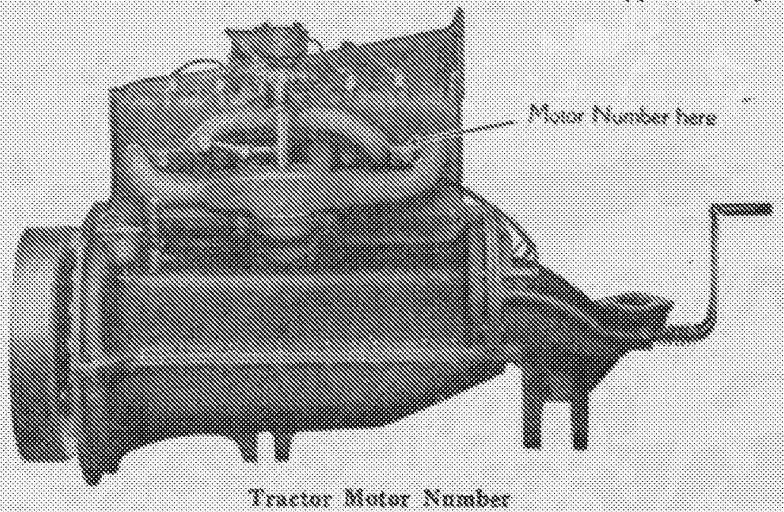
	Motor Number			Cars Built
Aug. 1-31	3277850	to	3346900	69050
Sept. 1-30	3346900	to	3423400	82500
Oct. 1-31	3423400	to	3515480	86080
Nov. 1-30	3515480	to	3588000	72570
Dec. 1-31	3588000	to	3659970	71970
	1920			
Jan. 1-31	3659970	to	3743075	83105
Feb. 1-29	3743075	to	3817430	74355
Mar. 1-31	3817431	to	3910003	92569
Apr. 1-30	3910001	to	3969150	59149
May 1-31	3969151	to	4055280	86129
June 1-30	4055281	to	4141450	86169
July 1-31	4141450	to	4233350	91900
Aug. 1-31	4233351	to	4329900	96549
Sept. 1-30	4329901	to	4426385	96484
Oct. 1-31	4426386	to	4526540	100154
Nov. 1-30	4526541	to	4617925	91384
Dec. 1-31	4617926	to	4698420	80584
	1921			
Jan. 1-31	none			
Feb. 1-28	4698416	to	4736431	38,015
Mar. 1-31	4736432	to	4810010	73,578

	Motor Number			Cars Built
Apr. 1-30	4810011	to	4907500	97489
May 1-30	4907501	to	5008000	100499
June 1-30	5008001	to	5114330	106330
July 1-31	5114331	to	5223135	108804
Aug. 1-31	5223136	to	5337545	114409
Sept. 1-30	5337546	to	5447816	110270
Oct. 1-31	5447816	to	5529619	81703
Nov. 1-30	5529620	to	5602301	72781
Dec. 1-31	5602302	to	5658071	55769
	1922			
Jan. 1-31	5658072	to	5683803	45796
Feb. 1-28	5624809	to	5737278	52489
Mar. 1-31	5737279	to	?	

Fuel Tank Measurements.

The old "round" gasoline tanks, as used on all Fords for many years, were of approximately 16 gallons capacity. These tanks were used on all touring and roadsters of earlier than 1920 make, and even on some of the 1920 models. With these round tanks, it will be noticed that one gallon, at the bottom of the tank, takes more than twice as much depth as a gallon near the middle.

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Tractor Motor Number

touring cars made on and after August of the 1922 model, they started installing "elliptical" or oval tanks on Ford cars.

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The "square" tank is now used on Ford Sedans, but was also used on many of the earlier Ford Coupes. With the square tank, each ¾ inch represents one gallon.

Fuel Tank Measurements.

Gallons	Square Tank	Round Tank	Oval Tank
1	⅝"	1⅜"	1⅛"
2	1⅝"	2⅜"	2⅛"
3	2¼"	3⅛"	2⅝"
4	3 "	4⅛"	3⅜"
5	3¾"	5⅛"	4⅛"
6	4⅛"	6⅛"	5 "
7	5¼"	6⅝"	5⅜"
8	6 "	7⅛"	6⅛"
9	6⅝"	8⅛"	7⅛"

Engine, Wheel, and Car Speeds.

The gear ratio of the Ford rear axle system is 3.63-to-one, meaning that the Ford engine crank shaft makes 3.63 turns, for each turn of the rear wheels. Now the Ford car is regularly fitted with 30 inch diameter tires, which have a circumference of 94.25 inches.

Since there are 5280 feet in a mile, then 5280 feet multiplied by 12, and divided by 94.25, gives 672.3 turns or revolutions of the Ford rear wheels for each mile of distance covered.

One mile per hour is equivalent to 88 feet per minute, so that at a car speed of 20 miles an hour, the car travels 1760 feet per minute, or one-third of a mile.

Car Speed	Engine Speed	Wheel Speed
1 m. p. h.	41 r. p. m.	11 r. p. m.
5	204	56
10	407	112
15	611	168
20	814	224
25	1018	280
30	1221	336
35	1426	392
40	1628	448
45	1832	505
50	2035	560
55	2239	616
60	2442	672

Overall Dimensions.

Model	Height	Width	Length
Touring	7'-0"	5'-7½"	11'-2½"
Runabout	6'-9"	5'-7½"	11'-2½"
Sedan	6'-9"	5'-7½"	11'-2½"
Coupelet	6'-9"	5'-7½"	11'-2½"
Chassis		5'-7½"	10'-8 "
Truck chassis		5'-7½"	12'-9 "

Ford Car Weights

Year	Coupe	Sedan	Runabout
Aug. 1 to July 31			
1915 to 1916	1540	1730	1395
1916 to 1917	1540	1730	1380
1917 to 1918	1580	1745	1385
1918 to 1919	1580	1715	1390
1919 to 1920	1580	1750	1390
1920 to 1921	1525	1725	1480
1921 to 1922	*1685	*1875	1380
	Touring	Chassis	Truck Chas.
1915 to 1916	1510	1200	----
1916 to 1917	1500	980	----
1917 to 1918	1480	980	1450
1918 to 1919	1500	980	1450
1919to 1920	1500	1060	1395
1920 to 1921	1500	1020	1380
1921 to 1922	1485	1070	1430

(*) This weight of Coupe and Sedan includes starter and demountables. Other cars equipped with starter, add 30 pounds.

Power means ability to do work. Consequently, it is the product of the rate and the speed at which the work is done. Torque, or turning power, denotes the rate of work and this "torque" reaches its maximum at speeds of about 900 revolutions. Then the torque gradually decreases with increasing speed, but the maximum horse power is developed at about 1600 revolutions. While tests have shown that Ford engines can develop as much as 22½ horse power, still it will be found that a maximum of 20 horse power, as given below, is more representative of Ford engines with wide open throttle in general use.

R.P.M.	Speed Car	Miles Per Hr. Truck	Lbs.	Horse Power
300	7.5	4.	35	2.
400	10.	5.25	57	4.5
500	12.5	6.55	69	6.5
600	15.	7.9	73	8.5
700	17.5	9.2	78	10.40
800	20.	10.50	81	12.53
900	22.5	11.85	83	14.20
1000	25.	13.15	82	15.60
1100	27.5	14.50	81	16.66
1200	30.	15.80	79	18.20
1300	32.5	17.10	77	19.
1400	35.	18.45	73	19.66
1500	37.5	19.75	70	20.
1600	40.	21.05	65	20.
1700	42.5	22.40	60	19.40
1800	45.	23.75	52	18.20
1900			47	17.

CAR PRICE CHANGES.

	Touring	Runabout	Chassis	Sedan	Coupelet	Truck	Town Car
Aug. 1909	$850	$825			$ 950		$1000
Aug. 1910	950	900			1050		1200
Aug. 1911	780	680			1050		1200
Aug. 1912	690	590					900
Aug. 1913	690	525					740
Aug. 1914	490	440		975	750		690
Aug. 1915	440	390	360	740	590		640
Aug. 1916	360	345	325	640	505		598
Aug. 1917	360	345	325	645	505	600	
Aug. 1918	525	500	475	775	650	550	
Aug. 1919	525	500	475	775	650	550	
Mar. 1920	575	550	525	*975	*850	600	
Aug. 1920	575	550	525	*975	*850	640	
Sept. 1920	440	395	360	*795	*745	545	
June 1921	415	370	345	*760	*695	495	
Sept. 1921	355	325	295	*660	*595	445	
Jan. 1922	348	319	285	*645	*580	430	

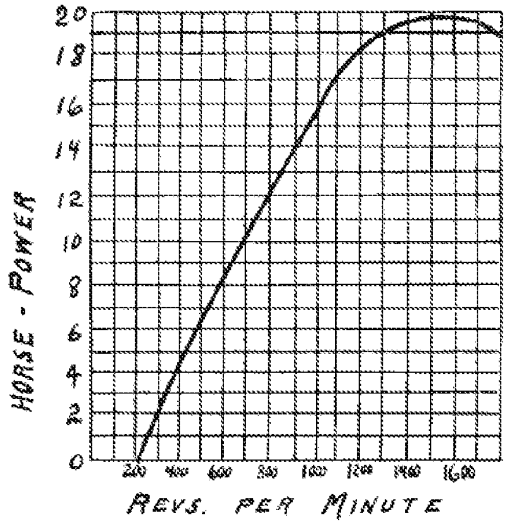
(*) Includes starter and demountable rims.

Canadian Ford Cars.

In Canada, the "Rule of the Road" in some of the provinces has been "Keep to the left!" following the old-world customs of Europe. While in other provinces, the new-world rule of "Keep to the right!" prevails. Consequently, the Ford in Canada had to become ambi-dexterous; so that it could keep to the left and be right, or keep to the right and get left, as occasion demanded.

Now this "two-sidedness" of use resulted in the Ford Motor Company of Canada wisely building their Fords to suit Canadian and foreign conditions (many Canadian Fords being exported). As a result of this, we find "port-sided" Fords, with doors on the left-hand side of the Ford touring cars and roadsters.

There is but little difference between the Sedans and Coupes as used in the United States and those built in Canada, because the American enclosed Fords already have doors on both sides. The Canadian Ford roadster does not differ much from the American built roadster, having the same kind of a top and a vertical windshield—but the Canadian Ford roadster has a door on the left-hand side.



POWER CURVE OF FORD

In addition to the door on the left-hand side of the driver's seat, the Canadian touring Ford has a "one-man" top. Also a "slanting" windshield that is so made that the lower glass can be moved to any angle for ventilation, while the upper glass can be moved to a rain-vision position.

Buying Canadian Ford Bodies.

While the Canadian Ford has decided improvements, it also sells for a decidedly higher price. And since Uncle Sam charges an import duty of 50 per cent, this means that by the time a Canadian Ford is brought into the United States, it will cost just about **twice** as much as a Ford bought here.

Some of our readers have considered making their summer tour over into Canada, discarding the American built body and fitting a Canadian built body on the car. Of course, the Canadian built body costs considerably more than the body built in America—not only because of its improvements, but also because Ford prices are higher in Canada on account of much greater government taxation, etc.

One of the Canadian Ford Agents has told us that when driving the Ford into Canada, it would be necessary to pay a duty of practically 35% on the body brought into Canada. Of course, if this was an old junk body, or if only the chassis were driven over, then this 35% duty would be avoided.

After installing the Canadian Ford body on the America chassis, it would be necessary to pay a 50% duty on the Canadian body going into the United States. There would also be a 4% sales tax, and the government would charge duty on the value of the American exchanged involved.

All things considered, the tariff makers seem to have succeeded in their purpose of making it impossible to do business on an international scale. But as the owners of American built Fords can easily purchase the rain-vision, ventilating windshields from American manufacturers; and as there are also a number of one-man tops for Fords on the market; the American Ford car owner can still get what he wants at a reasonable price.

Canadian Ford Weights.

The following weights of Canadian Ford cars do not include water, gasoline or oil.

Without Starter.

Type	Lbs.
Touring car	1570
Runabout	1450
Chassis	1110
Truck	1445

With Starter.

Touring	1655
Runabout	1535
Chassis	1195
Truck	1530
Coupe	1740
Sedan	1910

Canadian Fuel Tank Measurements.

Foreign buyers of American cars sometimes jump to the conclusion that American manufacturers are liars, because, when they attempt to fill the fuel tanks, they find that the fuel tanks will not hold the rated capacity. Likewise Americans are often surprised at the "miles-per-gallon" claimed by those living outside of the United States.

When is a gallon not a gallon? And the answer is that it changes when it crosses an imaginary line between the United States and Canada. In the United States, the Old English Wine Gallon, containing 231 cubic inches is standard. In Canada, the British Imperial gallon, of 277.274 cubic inches, is used. This means that an Imperial gallon is equal to practically 1-⅙ U. S. gallons.

Since the gallons are different, we are giving a table of gasoline tank measurements, showing number of Imperial gallons per inch:

Gallons	Square Tank	Round Tank	Oval Tank
1	6/7″	1-13/16″	1- 3/8″
2	1-5/7″	2-15/16″	2-5/16″
3	2-4/7″	3-15/16″	3-3/16″

4	3-3/7″	4- 7/ 8″	4″
5	4-2/7″	5-12/16″	4-12/16″
6	5-1/7″	6- 7/ 8″	5-11/16″
7	6″	7-15/16″	6-10/32″
8	8-1/8″	9- 5/ 8″	7-15/16″

Canadian Fordson Tractor Fuel Gauge
(Imperial Gallons)

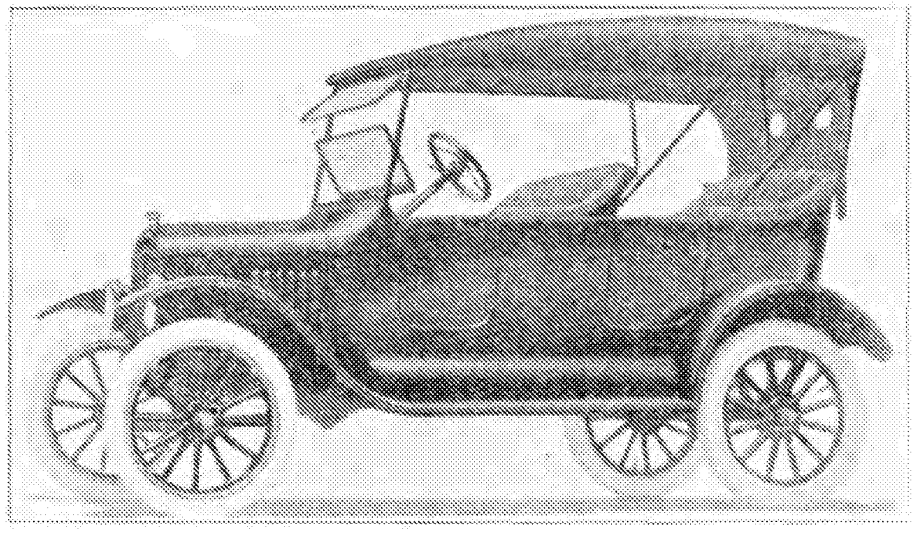
Gallons	1	2	3	4	5
Inches	1-11/64	1-51/64	2-17/64	2-47/64	3-13/64
Gallons	6	7	8	9	10
Inches	3-43/64	4-9/64	8-24/64	4-59/64	5-20/64
Gallons	11	12	13	14	15
Inches	5-35/64	5-60/64	6-21/64	6-46/64	7-12/64
Gallons	16	17	18	19	20
Inches	7-42/64	8-8/64	8-58/64	9-4/64	9-44/64

Canadian Ford Motor Numbers

The letter "C" is prefixed to the cars built by the Ford Motor Company of Canada, located at Ford, Ontario, Canada.

Canadian Ford Motor Numbers

Year	Serial Numbers
May 1, '13 to July 31, '13	C-1 to C-1500
Aug. 1, '13 to July 31, '14	C-1501 to C-16500
Aug. 1, '14 to July 31, '15	C-16501 to C-37500
Aug. 1, '15 to July 31, '16	C-37501 to C-70000
Aug. 1, '16 to July 31, '17	C-70001 to C-121000
Aug. 1, '17 to July 31, '18	C-121001 to C-170000
Aug. 1, '18 to July 31, '19	C-170001 to C-208500
Aug. 1, '19 to Aug. 31, '19	C-208501 to C-212500
Sept. 1, '19 to Sept. 30, '19	C-212501 to C-216500
Oct. 1, '19 to Oct. 31, '19	C-216501 to C-222500
Nov. 1, '19 to Nov. 30, '19	C-222501 to C-227500
Dec. 1, '19 to Dec. 31, '19	C-227501 to C-231000
Jan. 1, '20 to Jan. 31, '20	C-231001 to C-234000
Feb. 1, '20 to Feb. 29, '20	C-234001 to C-237500
Mar. 1, '20 to Mar. 31, '20	C-237501 to C-241500
Apr. 1, '20 to Apr. 30, '20	C-241501 to C-245500
May 1, '20 to May 31, '20	C-245501 to C-251000
June 1, '20 to June 30, '20	C-251001 to C-257000



Canadian Four-Door Touring

Being built in Canada (and not merely assembled there), these Canadian Ford originate within the far-flung limits of the British Empire and so can be shipped to India, New Zealand, Australia, and other parts of the British Empire, without having to pay the "preferential" tariffs charged against Fords made in the United States.

As some parts of Canada have such deep snow during the winter months that the use of even Ford cars is impractical, there is an "off" season in the sale of Ford Cars in Canada, during which Ford engines are made and stored in the factory. When production is resumed in the spring, then the engines last made and stored are the most accessible, and so are first used for assembly into completed Fords. Consequently, it is impossible to figure quite so closely, within months or weeks, just when a Canadian Ford was built. Though in the long sweep of the yearly production, the results will be found quite accurate.

July 1, '20 to July 31, '20	C-257001 to C-262500
Aug. 1, '20 to Aug. 31, '20	C-262501 to C-266000
Sept. 1, '20 to Sept. 30, '20	C-266001 to C-269500
Oct. 1, '20 to Oct. 31, '20	C-269501 to C-275500
Nov. 1, '20 to Nov. 30, '20	C-275501 to C-278500
Dec. 1, '20 to Dec. 31, '20	C-278501 to C-281000
Dec. 28, '20 to Jan. 17, '21	C-281001 to C-281500
Feb. 16, '21 to Mar. 21, '21	C-282000 to C-282500
Feb. 15, '21 to Feb. 25, '21	C-283000 to C-283500
Feb. 10, '21 to Mar. 4, '21	C-284000 to C-284500
Feb. 15, '21 to Mar. 14, '21	C-285000 to C-285500
Mar. 15, '21 to Mar. 24, '21	C-286000 to C-287000
Mar. 1, '21 to Apr. 11, '21	C-287500 to C-288000
Mar. 3, '21 to Mar. 22, '21	C-288500 to C-289000
Apr. 8, '21 to Apr. 20, '21	C-289500 to C-290000
May 17, '21	C-290500
Mar. 28, '21 to Mar. 31, '21	C-291000 to C-291500
Apr. 23, '21 to Apr. 30, '21	C-292000 to C-293500
May 3, '21 to May 31, '21	C-294000 to C-299500
June 3, '21	C-300000

Tractor Motor Numbers

The motor numbers of Fordson tractors will be found stamped on the right-hand side of the cylinder block near the front end of the engine. But the motor numbers of Fordson tractors do not run in the same smooth sequence as the motor numbers of Ford cars, due to the fact that some of the tractors have been assembled in the "overseas" factory at Cork, Ireland, while other tractors have been assembled at the various branches.

Serial Numbers of Tractors Shipped Each Month from October 1, 1917, to October 31, 1920.

1917	Motors assembled at Home Plant
October	1 to 75
November	
December	76 to 359
1918	
January	360 to 616
February	617 to 1731
March	1732 to 3082
April	{3083 to 3600 {6301 to 7608
May	7609 to 9580
June	9581 to 11537
July	11938 to 16225

1919	Motors assembled at Branches
July	
August	
September	
October	
November	
December	
1920	
January	100001 to 100192
February	100193 to 102294
March	102295 to 104759
April	{104760 to 105600 {120001 to 121591
May	121592 to 124731
June	{124732 to 125000 {135001 to 138088
July	{138087 to 140000 {150001 to 151504
August	151505 to 154890
September	154891 to 158177
October	158178 to 158322
November	
December	
1921	
January	
February	
March	158812 to 158326
April	158327 to 158970
May	158971 to 159452
June	
July	159424 to 159887
August	{159888 to 160000 {170001 to 170243
September	
October	170244 to 170394
November	170395 to 170890
December	170801 to 170957

1918	Motors assembled at Home Plant
August	16226 to 18637
September	18638 to 22248
October	22248 to 26287
November	26288 to 29978
December	29979 to 34426
1919	
January	34427 to 39564
February	39555 to 44782
March	44783 to 50061
April	50062 to 55079
May	55080 to 55110
June	55111 to 55304

Motors assembled at Cork Ireland	Motors assembled at Home Plant
C 1001 to C 1009	55305 to 60864
	{60865 to 63000 {63201 to 65000 {65001 to 68055
C 1010 to C 1068	68056 to 74809
{C 1069 to C 1080 {63001 to 63063	
63064 to 63362	74810 to 81363
63364 to 63177	81364 to 88486
63278 to 63290	88486 to 92113
{105025 to 105040 {65001 to 65240	92114 to 96973
105060 to 105290	{96974 to 100000
105291 to 105704	{110001 to 111500 111501 to 117133
105795 to 105895	{117134 to 120000
105894 to 106269	{125001 to 125038 125037 to 129104
106270 to 106625	129105 to 134622
106626 to 106871	{134623 to 135000 {140001 to 146097
106872 to 107199	{146098 to 150000
107200 to 107303	{160001 to 163426
65221 to 65500	163427 to 169258
107304 to 107640	169259 to 169583
107641 to 107954	
107955 to 108229	
108230 to 108243	------- -------
108244 to 108271	163584 to 168840
108272 to 108386	{168841 to 170000
108387 to 108456	{172001 to 175687
108457 to 108653	175688 to 181213
108654 to 108680	181214 to 187794
108681 to 108744	187795 to 193988
108745 to 108902	193989 to 198563
	198564 to 200018
108903 to 109208	200019 to 200431
109209 to 109387	200432 to 200842
109388 to 109575	200843 to 201025
109576 to 109672	------- -------

Tractor Road Speeds

Approximate engine speed, revolutions of rear wheels, and distance travelled by Fordson tractor, when in high gear. The normal engine speed is 1,000 revolutions per minute, at which engine speed the tractor travels at 6-¾ miles an hour. Traveling at higher speeds than this overloads the engine and will, in time, wear out the bearings or pound them out of round.

Rev. of Engine per Minute	Rev. of Rear Wheels per Min.	Tractor Speed Ft. per Min.	Miles per Hour
1000	54	594	6-¾
1185-⅜	64	704	8
1333-⅓	72	792	9
1481-½	80	880	10

As the Fordson tractor has no speedometer, it is convenient to measure speeds by pacing and timing with minute hand of watch. The average man takes 40 paces per hundred feet. It is better to take one's normal stride, and base calculations on it, rather than to strive to take 3 feet per step. Walk beside tractor and count paces. Forty paces per hundred feet is 2-½ feet per step.

Paces Per Minute

2½ feet per step	3 feet Per step	Miles per hour
53	44	1-½
61	51	1-¾
70	58	2
79	66	2-¼
87	73	2-½
96	80	2-¾
106	88	3

Tractor Fuel Tank Gauge

Measurements for stick for gauging fuel in tractor tank.

Gallons	1	2	3	4	5
Inches	15/16	1-7/16	1-13/16	2-3/16	3-9/16
Gallons	6	7	8	9	10
Inches	2-15/16	3-5/16	3-5/8	3-15/16	4-1/4
Gallons	11	12	13	14	15
Inches	4-7/16	4-3/4	5-1/16	5-3/8	5-3/4
Gallons	16	17	18	19	20
Inches	6-⅛	6-½	6-⅞	7-¼	7-¾

Stops Door Rattle

If the rear doors of the Ford rattle and will not stay closed, when the car is driven over rough roads; this is usually caused by the sagging of the back part of the body, tending to pull the doors away from the front part.

The remedy is to see that the two front and the two center body bracket bolts are perfectly tight and then remove the two rear body bracket bolts and have one man use an old Ford drive shaft, or other steel pry bar, and get behind the car and lift the back part of the body up off the frame and as high as possible. And then insert plain steel washers between the rear body brackets and the body sills and replace the bolts. Sometimes, but not often, it is necessary to use longer bolts.

One-Eyed Fords.

Sometimes, when one is driving at night, one bulb is burned out, and this opens the circuit so that the other bulb does not burn either. But, if the driver indulges in such human frailties as chewing gum, or smoking cigarettes, he will have some tin-foil with him. And this tin-foil can be used to advantage to complete the circuit across the base of the burned out bulb, and send the current to the remaining good bulb.

Insert a small, thin, round wad of tin-foil in the base of the socket, and then replace the burned out bulb. And this will give the connection to the other bulb. Be careful not to race the engine, as all the current is now concentrated in one bulb.

Repair Radiator Tubes

Radiator tubes are frequently damaged in accidents and it is valuable to know of a rough-and-ready method of roadside repairs which will get the car home. Pry the fins up and away from the damage sections of the tube, so that leaky parts of the tubes will be accessible.

Now use cord, or common store string, and wrap it around the leaky or split tube, for a distance of half an inch or so above and below the leak. Use two or more layers, if necessary, to completely cover the leak.

Give the string a generous coating of white lead, or iron cement, such as is used for stopping leaks by plumbers and steam fitters. This forms a cheap and often quite lasting repair. Of course, one cannot easily reach the back tubes to wind them. But then it is the front tubes which are most often damaged in collisions. The string may be looped around with a hooked wire or shoe buttoner. And the white lead applied with a match.

Repairs Worn Timer

A temporary repair, for making a worn timer work a while longer and bringing the car home, can be accomplished by removing the four terminals from the shell and then loosening the nuts that hold the segments in place.

Now drive out the four contact segments and place washers, cut from a piece of inner tube rubber, or cardboard, under each timer segment. This forces the contact segments out, so that they make better contact with roller. When the nuts are replaced on the segment studs, the washers are pressed down, and the segments drawn down, approximately flush with the fibre raceway.

FORD MOTOR TROUBLE CHART

By G. L. MITCHELL.

The chart has been prepared to outline the various troubles met in the Ford power plant and to enable the owner and mechanic to diagnose and locate these faults.

A general knowledge of power plant troubles is necessary to use the chart, the mechanic must be able to tell if motor is "missing" or running "irregularly," or if it is loosing power or overheating. Recognizing these main divisions permits one to quickly locate the trouble and remedy.

In many cases the trouble will be found in the auxiliary members of the power plant rather than in the motor itself. The chart, however, only undertakes to include the more common troubles of the power plant.

Some time ago the Scientific American published a similar chart for the use of owners of other cars. This chart, especially prepared for Ford owners, should be found very helpful.

I. MISSING OR IRREGULAR ACTION			
Part at Fault	Trouble	Effect	Remedy
1. Spark Plug	Binding post loose	No spark	Tighten terminal
	Leak in threads	Low compression	Screw down tight
	Defective gaskets	Low compression	Replace plug
	Cracked insulator	Short circuit	Replace plug
	Points too far apart	No spark	Set points closer
	Points too close	No spark	Set points apart
	Carbon deposits	No spark	Clean plug
	Plug too long	Pre-ignition	Use shorter plug
2. Combustion Chamber	Carbon deposits	Pre-ignition	Remove carbon
3. Piston Head	Carbon deposit	Pre-ignition	Remove carbon
	Crack or blow-hole (Rare)	Low compression	Replace piston
4. Valve Head	Washed or pitted on seat	Poor mixture. Low compression	True up valve head and grind to seat or replace with new valve
5. Valve Stem	Bent or sticks in valve guide	Low compression. Irregular valve action	Straighten stem. Clean guide. Oil
6. Valve Spring	Weak or broken	Irregular valve action	Replace with new spring
7. Exhaust Valve Seat	Scored or warped. Dirty or covered with gummed oil and carbon	Valve will not close. Poor mixture Poor compression	Use reseating reamer. Clean and grind to seat
8. Exhaust Valve Stem Guide	Warped or carbonized	Valve stem sticks	Clean guide
	Worn guide	Low compression Poor seating Poor mixture	Ream out guide and fit valve with oversize stem
9. Valve Stem Clearance	Too little	Valve will not shut	Use valve adjusters. Set inlet gap .020". File off end of stem. Set exhaust gap .025"
	Too much	Valve opens late and closes early	

1. MISSING OR IRREGULAR ACTION—Continued			
Part at Fault	Trouble	Effect	Remedy
10. Cam Shaft Bearing	Worn	Valve openings mistimed or valve lift short	Replace cam shaft bushings
11. Cam	Worn contour	Valve mistimed Valve lift short	Replace cam shaft
12. Timing Gears	Not properly meshed	Valves mistimed	Time properly and fasten to shaft with key
	Worn or broken teeth	Valves do not act	Replace with new gears
13. Cam Follower Guide or Valve Tappets	Loose in crank case	Oil leaks and poor valve action	Fasten securely
	Worn in bore		New guide
14. Inlet Valve	Opens late Closes early	Back fire in carburetor Motor loses power	Adjust clearance Time properly
15. Inlet Valve Seat	Warped or pitted Carbon deposit	Poor compression Back fires in carburetor	Use reseat reamer Clean and grind
16. Inlet Valve Stem Guide	Worn	Poor mixture Low compression	Ream out guide and use valve with oversize stem
17. Carburetor	Weak mixture	Back fires in carburetor	Adjust carburetor for richer mixture
	Too rich mixture	Carbon deposit Sluggish motor	Adjust carburetor for weaker mixture
18. Inlet Manifold	Leak at joints or defective gasket	Poor mixture	Tighten bolts Use new gasket Shellac joints
19. Piston	Walls scored	Poor mixture Low compression	Replace with new piston
20. Piston Rings	Loss of spring Loose in grooves Worn or broken	Poor compression	Replace with new rings
	Slots in line	Poor compression	Turn rings so slots are staggered
21. Cylinder Wall	Scored	Poor compression	Regrind cylinder and use oversize pistons
22. Valve Spring Collar Key	Lost or broken	Releases spring Valve stays open	Replace with new key
23. Cylinder Head Gasket	Leak	Poor compression Water in cylinder	Draw down tighter Use new gasket
2. LOST POWER AND OVERHEATING			
24. Inlet Manifold Connections	Poor mixture in all cylinders, or poor mixture in one set and good mixture in the other set of cylinders	Surging or pulsating	Tighten connections Put in new gaskets
25. Upper Water Outlet of Cylinder Block	Loose or defective gasket	Loss of water and overheating	Tighten bolts Use new gasket

2. LOST POWER AND OVERHEATING—Continued			
Part at Fault	Trouble	Effect	Remedy
26. Radiator	Tubes stopped up by sediment	Overheating	Clean thoroughly with washing soda solution
27. Radiator Hose Connections	Loose or hose rotted	Loss of water Overheating	Tighten hose clamps Replace hose
28. Combustion Chamber	Crack or blowhole	Low compression	Weld
	Rough	Pre-ignition	Smooth up
	Carbon deposit	Pre-ignition	Remove carbon
29. Valve Head	Warped or pitted	Low compression	Tune up in lathe
	Covered with carbon		Clean and grind
30. Valve Seat	Pitted	Low compression	Use reseat reamer
	Covered with carbon		Clean and grind
31. Wrist Pin	Loose	Poor compression Scored cylinder	Regrind cylinder and fit oversize piston. Fasten wrist pin securely
32. Piston Rings	Loss of spring	Low compression	Peen rings or replace with new
	Loose in grooves	Low compression Overheating	Fit new rings
	Slots in line	Low compression	Turn rings so slots are staggard
	Broken because too tight	Scored cylinder wall. Hot oil in crank case. Low compression	Regrind cylinder, fit oversize pistons and new rings
	Insufficient opening in gap	Excessive friction Overheating Broken rings Poor compression	Replace with new rings, or widen gaps
33. Piston	Binds in cylinder Walls scored or worn out of round	Overheating Excessive friction	Lap off excess metal, or Replace with new piston
34. Cylinder Walls	Scored	Low compression	Regrind cylinderfor oversize piston
	Dry form lack of oil	Excessive friction Overheating	Clean oil tube Replenish oil
35. Cam Shaft Drive Gears	Loose on shaft	Irregular valve action	Fasten to shaft
	Not properly meshed	Valves out of time Loss of power Overheating	Time properly
	Worn or broken teeth	No valve action	Replace with new gears
36. Oil Tube	Stopped up	No oil on timing gears or in crank case dip troughs	Clean out
37. Crank Shaft	Scored or rough at journals	Overheating	Smooth up
	Sprung	Overheating Pounding	Straighten

2. LOST POWER AND OVERHEATING—Continued			
Part at Fault	Trouble	Effect	Remedy
38. Crank Pin and Main Bearings	Adjusted too tight	Loss of power Overheating	Adjust to running clearance
	Insufficient oiling		Clean oil hole
39. Oiling System	Insufficient oiling	Overheating and burned out bearings Scored cylinder and piston walls	Add more oil
	Poor oil		Use grade recommended by Ford Motor Co.
	Dirty oil		Wash crank case with kerosene Replace with new oil
40. Water Jacket	Clogged with sediment	Overheating	Remove sediment
2. NOISY OPERATION			
41. Spark Plug	Leaks	Hissing	Tighten or use new plug
42. Cylinder Wall	Scored	Knocking	Regrind and fit oversize piston
43. Manifold Joints	Leakage	Hissing	Tighten
	Defective gaskets	Hissing	Use new gaskets
44. Combustion Chamber	Carbon deposits	Knocking	Remove carbon
45. Cams	Worn contour	Metallic knock	Replace
46. Piston Head	Carbon deposit	Knock	Remove carbon
47. Wrist Pin	Worn, loose in piston	Dull metallic knock	Replace bushings or pin or both
48. Connecting Rod	Worn bearings	Distinct sharp knock	Adjust or replace
49. Main Bearings	Worn	Dull knock	Adjust
50. Oil Pan Bolts	Worn or loose	Rattle	Tighten
51. Timing Gears	Loose on shafts	Metallic knock	Tighten
	Worn or broken teeth	Grinding noise	Replace
	Improper meshing	Grinding	Mesh properly
52. Cam Shaft Bearings	Worn or loose	Slight knock	Replace
53. Valve Tappets	Gap too wide	Sharp clicking	Use valve adjusters or new valves
54. Magneto	Magneto striking coils	Grating noise Weak or useless magneto	Adjust magneto air gap to $\frac{1}{32}$" Recharge magneto Repair coils
55. Flywheel	Loose on crank shaft	Heavy dull knock	Tighten holding bolts

3. NOISY OPERATION—Continued			
Part at Fault	Trouble	Effect	Remedy
56. Transmission Gears	Worn or loose on pins	Grinding in neutral, low and reverse	Replace with new gears and pins
57. Transmission Bands	Worn	Chatter and jerky action in low and reverse also when using foot brake	Replace transmission band linings
	Adjusted too tight	Car creeps forward unless hand brake is set. Excessive friction. Overheating. Loss of power	Loosen tension on bands
58. High Speed Clutch	Discs worn rough	Fierce, grabbing clutch	Install new discs
	Weak clutch spring	Slipping clutch	Install new spring
59. Crank Case Arms	Broken	Motor loose in frame. Heavy knocking	Weld broken member or use repair bracket or replace crank case
	Loose on frame	Motor loose in frame Heavy knocking	Tighten securely to frame

Starts Stiff Engine.

Here is a little hint for Ford owners, who overhaul their own cars. To start a motor that has been overhauled, is a very difficult task, when there is no battery around. You don't need a battery to start your stiff motor. All you have to do is go to your neighbor and ask him, if you can have his Ford for a few minutes. Your neighbor, probably will say, "Nothing doing. I'll not tow that stiff motor with my car."

But, tell him in advance that you don't want to use his car for towing purposes. Just long enough to use his power plant to get your car started. Then you will have him puzzled. He certainly will want to see what you are going to do with his Ford.

Now, instead of looking around for a tow line, look around for two pieces of wire, about 8 or 10 feet long. Connect one wire, from his magneto terminal to your battery side terminal. And connect the other wire, car-to-car, magneto terminal to your battery side terminal. And connect the other wire, car-to-car, for ground. The best and easiest way to ground it, is to fasten the wire to both radiator rods.

Now, all ready, let's go! Let your neighbor start his engine and keep it running. Retard your spark lever. Throw your switch to battery side, and a few lift ups will start your stiff motor very easily. Because there is plenty of juice there, it has a battery beaten.

This is also a good stunt on cold mornings, when there are a number of Fords with weak magnetos. This is what I have done on cold mornings. I would pick out a car that was an easy starter, with a good, live magneto. Then I would go from car to car, until I had them all started. Remember, cranking one cold car is not so bad; but when it comes to cranking a dozen Fords, it's no fun.

Here is another thing I do. Often I am sent out to start a new driver's car. Generally, when I get out, I find that the new driver cranks and cranks until he has the motor flooded. Of course, after the motor is flooded, no hand cranking will start the motor. All I do is connect the wires. And after a few turns the car will start up fine. I have started many a Ford on the country roads in this manner. Every Ford owner should carry about 8 or 10 feet of wire in his tool box, for emergency.

Leaky Radiators

To stop the radiator from leaking,—put one teaspoonful of bran into it. Start the engine to cause water to circulate. Inside of twenty minutes, the radiator will be tight and will stay tight—even if the holes are ⅛ of an inch in diameter.

Get the bran that is sold in packages to eat, as it is without flour or gluten, and will not clog radiator tubes. Do not use "shorts," as the flour in it will cook in lumps, plug the tubes and cause boiling.

Do not put the bran in and stand around waiting for leaks to stop—they won't. Get in, ride around twenty minutes, and they will.

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14452339	CTNF	12/10/2018	PET744/4-001REUS/58000
	892	12/10/2018	PET744/4-001REUS/58000

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USPTO Automated Interview Request (AIR)

Dec 21 2018

This paper requesting to schedule and/or conduct an interview is appropriate because:

This submission is requested to be accepted as an authorization for this interview to communicate via the internet. Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned concerning scheduling of the interview via video conference, instant messaging, or electronic mail, and to conduct the interview in accordance with office practice including video conferencing.

Name(s):
Gaurav Goel

S-signature:
/Gaurav Goel/

Registration Number:
56804

U.S. Application Number:
14452339

Confirmation Number:
7313

E-mail Address:
ggoel@velaw.com

Phone Number:
5125428456

Proposed Time of Interview:
1-9-2019 2:00 PM ET

Alternative Proposed Time(s) of Interview:
1-9-2019 3:00 PM ET

Alternative Proposed Time(s) of Interview:
1-10-2019 2:00 PM ET

Prefered Interview Type:
Telephonic

I am the applicant or applicant's representative for this application.

Topic for Discussion:
Rejection of the claims over Gush and Guo.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Petrosino	PET744/4-001REUS/58000	7313

21586 7590 01/17/2019

VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

EXAMINER	
VINCENT, SEAN E	

ART UNIT	PAPER NUMBER
3991	

NOTIFICATION DATE	DELIVERY MODE
01/17/2019	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):

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ggoel@velaw.com
sbrown@velaw.com

Applicant-Initiated Interview Summary	Application No. 14/452,339	Applicant(s) Petrosino, Frank		
	Examiner SEAN E VINCENT	Art Unit 3991	AIA (First Inventor to File) Status No	Page 1 of 2

All participants (applicant, applicants representative, PTO personnel):

1. SEAN E VINCENT (Primary Examiner); Telephonic
2. Terrence Till (Primary Examiner); Telephonic
3. Jean Witz (SPE); Telephonic
4. Frank Petrosino (Inventor); Telephonic
5. Stephen Stout (Attorney of Record); Telephonic
6. Gaurav Goel (Attorney of Record); Telephonic

Date of Interview: 09 January 2019

Claims Discussed: 29

Prior Art Discussed: Gush and Guo

Brief Description of the main topic(s) of discussion: The inventor provided background information for the discovery of the invention and the claimed features lacking from the Gush reference were discussed.

Issues Discussed:

Item(s) under 35 U.S.C. 103:
The lack of sacrificial anodic teachings in Gush coupled with the express teaching of sacrificial anodes in Guo may preclude a combination of the two teachings and this fact should be detailed in an official response to the outstanding rejections. It was agreed that the prior art rejections could be overcome by an official response that focused on the chemical and electrical differences between the claims and the prior art instead of the structural differences. Claim 29 was omitted from the prior art rejections as an oversight. The limitation claimed therein would not by itself make 25 allowable.

Nature of Invention and state of art:
Mr Petrosino related the story of how a General Motors Technical Service Bulletin(TSB) and subsquent TSB led him to attempt the use of a grounded magnesium electrode near the hottest portion of a radiator interior and the successful protection of the radiator. This story was not of record previously and the examiner expressed that it presented the claims in a new light.

Formalities:
The error statement in the most recent reissue declaration is not technically correct. This was clarified in the interview by the examiner and the examiner suggested filing a new reissue declaration with a more correct characterization of claim 12 and claims dependent therefrom.

/Sean E Vincent/ Patent Reexam Specialist, Art Unit 3991	/Jean C. Witz/ Supervisory Patent Reexamination Specialist CRU 3991

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

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14452339	INTV.SUM.APP	01/17/2019	PET744/4-001REUS/58000
	EXIN	01/17/2019	PET744/4-001REUS/58000

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Inventor(s):	Frank Amidio Catalano	Art Unit:	3991
Application No.:	14/452,339	Confirmation No.	7313
Filing Date:	August 5, 2014	Examiner:	Vincent, Sean E.
		Atty. Docket:	PET744/4-001REUS/58000
Title:	ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE		

REQUEST TO CORRECT INVENTORSHIP
IN A NON-PROVISIONAL PATENT APPLICATION UNDER 37 C.F.R. § 1.48

VIA EFS-WEB

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

Sir:

This paper is a request to amend the nonprovisional application referred to above to change the name of the inventor due to a legal name change. The inventor has legally changed his name from Frank Amidio Petrosino to Frank Amidio Catalano, which is documented in the attached copies of a Decree of Adult Adoption dated June 30, 2017, a new birth certificate from the State of New York, and a prior birth certificate from the State of New York. Therefore, the Office is respectfully requested to correct the name of the inventor as indicated in the attached Application Data Sheet, which is amended to indicate the name change to correct inventorship.

The required fee of $50.00 in accordance with 37 C.F.R. 1.17(q) will be submitted electronically. If the fee is inadvertently omitted, or if any further fees are deemed to be due with the filing of this paper, the Commissioner is hereby authorized to deduct said fees from Deposit Account No. 22-0365/PET744/4-001REUS/58000.

Respectfully submitted,

/Stephen C. Stout/

Stephen C. Stout
Reg. No. 61,326
Attorney for Applicant

VINSON & ELKINS L.L.P.
1001 Fannin Street, Suite 2500
Houston, Texas 77002-6760
512.542.8929
512.236.3308 (Fax)

Date: February 18, 2019

STATE OF NORTH CAROLINA
CABARRUS COUNTY

IN THE GENERAL COURT OF JUSTICE
DISTRICT COURT DIVISION
BEFORE THE CLERK

FILED
17 SP 324
2017 JUN 30 A 11:40
CABARRUS C.S.C.
BY

CHARLES PETER CATALANO, SR.
(Full name of petitioning parent 1)

(Full name of petitioning parent 2)

FOR THE ADOPTION OF
FRANK AMIDIO CATALANO
(Full name by which adult adoptee is to be known)

DECREE OF

ADULT ADOPTION

This cause coming on to be heard and being heard before the undersigned, the Court, from all the evidence presented in this proceeding, makes the following findings of fact and law:

1. That all necessary parties are properly before the court: and, or, for adoptions filed on or after January 1, 2002 that notice of the adoption petition has been served on any person entitled to receive notice of this proceeding, or that notice has been waived by the court for cause pursuant to G.S. 48-2-401(d).

2. That the adoptee is: ☑ eighteen years of age or older; ☐ a married minor; ☐ an emancipated minor and proper consent to the adoption has been given by him/her in writing and has been filed with this proceeding;

3. That any other necessary consent has been obtained and any other necessary documents or judicial orders have been obtained and filed with the Court;

4. That the adoptee was born in the State/Country of NEW YORK / USA on the 4TH day of JUNE, 1975;

5. That a duly verified Petition for Adoption of said adult was filed with this Court by the above-named petitioner(s) on the 22ND day of MAY, 2017;

6. That at least 30 days have elapsed since the filing of the Petition for Adoption or that requirement has been waived for cause by the Court;

7. That this adoption is entered into freely and without duress or undue influence for the purpose of creating the relation of parent and child between each petitioner and the adoptee, and each petitioner and the adoptee understand the consequences of the adoption;

8. That there has been substantial compliance in this proceeding with the provisions of Chapter 48;

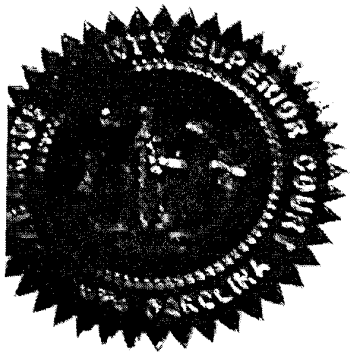
9. That the Decree of Adoption establishes the relationship of parent and child between each petitioner and the individual being adopted. From the date of the signing of the Decree, the adoptee is entitled to inherit real and personal property by, through, and from the adoptive parents in accordance with the statutes on intestate succession and has the same legal status, including all legal rights and obligations of any kind whatsoever, as a child born the legitimate child of the adoptive parents.

10. That the Decree of Adoption severs the relationship of parent and child between the individual adopted and that individual's ☑ Father ☐ Choose an item

NOW THEREFORE, upon the foregoing findings as a matter of law, it is hereby ordered, adjudged, and decreed: that from the date of the entry of this Decree, the adult is declared adopted for life by the petitioner(s) and that said

adult shall henceforth be known by the name of FRANK AMIDIO CATALANO and the State Registrar of Vital Records shall make a new birth certificate for said adult adoptee in accordance with the provisions of Section 48-9-102 (g) of the General Statutes.

This 30TH day of JUNE, 2017.



Clerk of Superior Court

CABARRUS County

NOTE:
Four DSS-5166's are prepared. After the Clerk of Superior Court signs and affixes seal, one form is retained in the Clerk of Superior Court's office; one form is given to petitioners; and **two certified** copies are forwarded within ten days, **along with originals of all other documents filed in proceeding,** to the Division of Social Services, State Department of Health and Human Services. One of these copies will be attached to the Report to Vital Records and sent to the appropriate state in which the adult was born.

New York State Department of Health
Vital Records Section

Certificate of Birth

Recorded District: 5820
Register Number: 0168
Birth Number: 131-1975-060933

Infant

1. Name: *(First, Middle, Last)*: Frank Amidio Catalano

2. Sex	3a. Plurality	3b. If Not Single Birth Born:	4a. Date of Birth Month	Day	Year	4b. Hour
Male	Single		06	04	1975	07:38 PM

Place

5a. County	5b. Town	5c. City or Village
Wayne		Newark

Mother

6a. Maiden Name: *(First, Middle, Last)*	6b. Age	6c. State/Country of Birth	6d. Soc. Sec. Num.
Bonnie Ann Dalberth	20	New York	

7a. Residence: *(State)*	7b. County	7c. Town	7d. City or Village
New York	Wayne	Marion	

7e. Within Corporate Limits?	7f. Street and Number	7g. Zip Code:
No	281 White Road	14505

8. Mailing Address *(Include Zip Code)*: 281 White Road Marion, NY 14505

Father

9a. Name: *(First, Middle, Last)*	9b. Age	9c. State/Country of Birth	9d. Soc. Sec. Num.
Charles Peter Catalano	23	New York	

10. Local Filing Date Month	Day	Year	11a. I hereby certify that this certificate was filed pursuant to the provisions of Public Health Law Section 4138:	11b. Date Month	Day	Year
06	10	1975	Robert LoCicero, Director of Vital Records	10	06	2017

DOH-2075.2 (5/2012)

A172790018

CUT HERE

This is a copy of the above-noted child's amended birth certificate. Carefully review the certificate and report any discrepancies to:

BIRTH AMENDMENT UNIT
VITAL RECORDS SECTION
P.O. Box 2602
Albany, NY 12220-2602

STATE OF NEW YORK
DEPARTMENT OF HEALTH

C 816813

CERTIFICATION OF BIRTH

THIS IS TO CERTIFY that the person named on this certificate was born on the date and at the place shown and this record of birth was filed with the Registrar of Vital Statistics of this Registration District.

DISTRICT NUMBER	REGISTRATION NUMBER
5820	168

NAME	
Frank Amidio Petrosino	
SEX: Male	DATE OF BIRTH: June 4, 1975
PLACE OF BIRTH (COUNTY): Wayne	CITY, TOWN OR VILLAGE: Village of Newark
FILING DATE: June 10, 1975	

REGISTRAR OF VITAL STATISTICS

5820 Newark
DISTRICT

July 29, 2002
DATE

WARNING: ANY ALTERATION VOIDS THIS CERTIFICATION

DOH-2248 (12/98)

Doc Code: REIS.DECL

Document Description: Reissue Declaration Filed In Accordance With MPEP 1414

PTO/AIA/05 (08-12)
Approved for use through 01/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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.

REISSUE APPLICATION DECLARATION BY THE INVENTOR	Docket Number (Optional) PET744/4-001REUS/58000

I hereby declare that:

Each inventor's residence and mailing address are stated below next to their name.

I believe I am the original inventor or an original joint inventor of the subject matter which is described and claimed in patent number 8,826,481 granted Sept. 2, 2014 and for which a reissue patent is sought on the invention titled Excessive Prevention Device and Method of Use

the specification of which

☐ is attached hereto.

☑ was filed on August 5, 2014 as reissue application number 14/452,339

The above-identified application was made or authorized to be made by me.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

☑ by reason of a defective specification or drawing.

☑ by reason of the patentee claiming more or less than he had the right to claim in the patent.

☑ by reason of other errors.

At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, a claim that the application seeks to broaden must be identified.

Previously during this reissue application, corrections to the specification at Col. 6, lines 19-22 of the '145 patent were submitted.

Applicant further claimed less than that to which he is entitled, which is the subject matter of amended claim 12 and new claims 15-47.

The legal name of the inventor has changed and is updated in this reissue application.

This collection of information is required by 37 CFR 1.175. 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 30 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.

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PTO/AIA/05 (06-12)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)

Docket Number (Optional): PET744/4-001REUS/58000

Note: To appoint a power of attorney, use form PTO/AIA/81.

Correspondence Address: Direct all communications about the application to:

☑ The address associated with Customer Number: 21586

OR

☐ Firm or Individual Name

Address					
City		State		Zip	
Country					
Telephone		Email			

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

Legal name of sole or first inventor (*E.g.*, Given Name (first and middle (if any)) and Family Name or Surname)

Frank Amidio Catalano

Inventor's Signature			Date (Optional)
Residence: City	State		Country
Concord	NC		US
Mailing Address			
3929 Amarillo Dr.			
City	State	Zip	Country
Concord	NC	28027	US

☐ Additional joint inventors are named on the ____ additional sheet(s) PTO/AIA/07 attached hereto.

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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.

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Electronic Acknowledgement Receipt

EFS ID:	35179701
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
Filer:	Stephen Charles Stout/Bobbie Melder
Filer Authorized By:	Stephen Charles Stout
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	18-FEB-2019
Filing Date:	05-AUG-2014
Time Stamp:	18:26:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	20190218UpdatedADS.pdf	388070 a7211c525af070db4d1fee177ab32633967ad48b	no	6

Warnings:

Information:					
This is not an USPTO supplied ADS fillable form					
2	Petition for review by the Office of Petitions	20190218PetitionDecreeBC-FINAL.pdf	602588 63bb7dc1efe96e8893a0bd39030d20c03b9b973d	no	6
Warnings:					
Information:					
3	Reissue dec filed in accordance with MPEP 1414	20190218ReissueDeclaration.pdf	1627566 fb978183afa1e3dd3ad1c14431aa720af15320d4	no	3
Warnings:					
Information:					
4	Amendment/Req. Reconsideration-After Non-Final Reject	20190218ResponseNFOA.pdf	306326 9acac644770ce1c8a12e134dff3e7a9bc0e2955b	no	15
Warnings:					
Information:					
		Total Files Size (in bytes):	2924550		

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.

PTO/AIA/14 (02-18)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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	PET744/4-001REUS
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

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.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Frank	Amidio	Catalano ~~Petrosino~~	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Concord	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	3929 Amarillo Dr.		
Address 2			
City	Concord	**State/Province**	NC
Postal Code	28027	**Country** i	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).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	21586		
Email Address	iptldocket@velaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	Electrolysis Prevention Device and Method of Use		
Attorney Docket Number	PET744/4-001REUS	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	27	**Suggested Figure for Publication (if any)**	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **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).
Either enter 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:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	21586		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim 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.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	reissued of	12/631903	2009-12-07	8236145	2012-08-07

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. 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. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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	PET744/4-001REUS
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◯ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Applicant:

Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	PET744/4-001REUS
	Application Number	
Title of Invention	Electrolysis Prevention Device and Method of Use	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Gaurav Goel/			Date (YYYY-MM-DD)	2019-02-18
First Name	Gaurav	Last Name	Goel	Registration Number	56,804

Additional Signature may be generated within this form by selecting the Add button.

Electronic Patent Application Fee Transmittal

Application Number:	14452339
Filing Date:	05-Aug-2014
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Filer:	Stephen Charles Stout/Bobbie Melder
Attorney Docket Number:	PET744/4-001REUS/58000

Filed as Micro Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
PROCESSING FEE, EXCEPT PROV. APPLS.	3830	1	35	35
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
CORRECTION OF INVENTORSHIP ON MERITS	3819	1	150	150
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Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Petrosino
Customer Number:	21586
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 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	Fee Worksheet (SB06)	fee-info.pdf	32367 ec8ac9bceaa3aa6260071290ad58c9c6f116ba7d	no	2

Warnings:

Information:

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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Frank Amidio Catalano	Art Unit:	3991
Application No.:	14/452,339	Confirmation No.	7313
Filing Date:	08/05/2014	Examiner:	Vincent, Sean E.
		Atty. Docket:	PET744/4-001REUS/58000
Title:	ELECTROLYSIS PREVENTION DEVICE AND METHOD OF USE		

RESPONSE TO OFFICE ACTION

VIA EFS WEB

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

Sir:

Applicant respectfully submits this Response to the Office Action dated December 10, 2018 (herein "Office Action") and requests favorable action thereon.

This Response is submitted within the three month period. It is believed that no fees are due in connection with this Response; for any fees required in connection with the present communication, the Commissioner is authorized to deduct any such fees from Vinson & Elkins L.L.P. Deposit Account No. 220365/PET744/4-001REUS/58000

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CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. (Original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached overtop the device.

2. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of aluminum.

3. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of magnesium.

4. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is made of zinc.

5. (Original) The electrolysis prevention device of claim 1 wherein the sacrificial node is grounded to a vehicle.

6. (Original) The electrolysis prevention device of claim 1 wherein an end of the anode holder is attached to an additional wire positioning the sacrificial anode further down into the flow of liquid coolant within the engine heat exchange component.

7. (Original) The electrolysis prevention device of claim 1 wherein the anode holder is connected to the engine heat exchange component by a clamp.

8. (Original) The electrolysis prevention device of claim 1 wherein the engine heat exchange component is a radiator.

9. (Original) The electrolysis prevention device of claim 1 wherein the wherein the engine heat exchange component is a heater core.

10. (Original) A radiator with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

11. (Original) A heater core with the electrolysis prevention device of claim 1 in proximity to an inlet connection thereof.

12. (**Amended**) A method of preventing corrosion of **a radiator [an engine heat exchange component], the method** comprising**: [adding or]** installing a sacrificial anode assembly **including a sacrificial anode** within the **radiator [an engine heat exchange component adjacent an inlet thereof], wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator**.

13. (Original) An electrolysis prevention device, for preventing corrosion caused by electrolysis comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode;

wherein the holder is adapted to fit through and around the inlet connection of an engine heat exchange component in such a way as to allow for a hose to be attached to and around the inlet connection without dislodging the holder.

14. (Original) An engine heat exchange component with the electrolysis prevention device of claim 13 installed such that the holder of the device extends through, and is doubled back around, the inlet connection and the sacrificial anode is disposed in proximity to the inlet connection.

15. (New) The method of claim 12, wherein the sacrificial anode consists essentially of an active metal.

16. (New) The method of claim 15, wherein the sacrificial anode consists essentially of aluminum, magnesium, or zinc.

17. (New) The method of claim 12, wherein installing the sacrificial anode assembly further comprises: installing the sacrificial anode assembly in a fitting hole in the radiator.

18. (New) The method of claim 12, wherein the sacrificial anode is grounded.

19. (New) The method of claim 12, wherein installing the sacrificial anode assembly further comprises: installing the sacrificial anode assembly within the fluid flow of the radiator.

20. (New) The method of claim 12, wherein the radiator comprises aluminum.

21. (New) The method of claim 12, wherein the hot liquid is coolant.

22. (New) The method of claim 12, wherein the hot liquid is water.

23. (New) The method of claim 12, wherein the hot liquid is antifreeze.

24. (New) The method of claim 12, further comprising installing a second sacrificial anode assembly within the radiator.

25. (New) A radiator for use in a motor vehicle, the radiator further comprising:

a hot liquid inlet to the radiator from an engine of the motor vehicle, the hot liquid inlet providing fluid communication for fluid flow of hot liquid from the engine; and

a sacrificial anode installed within 10 inches of the hot liquid inlet of the radiator.

26. (New) The radiator of claim 25, wherein the sacrificial anode consists essentially of an active metal.

27. (New) The radiator of claim 26, wherein the active metal is at least one of aluminum, magnesium, and zinc.

28. (New) The radiator of claim 25 wherein the sacrificial anode is installed in a fitting hole penetrating the radiator.

29. (New) The radiator of claim 25 wherein the sacrificial anode is installed onto a surface of the radiator.

30. (New) The radiator of claim 25 wherein the sacrificial anode is grounded to the motor vehicle.

31. (New) The radiator of claim 25 wherein the radiator comprises aluminum.

32. (New) The radiator of claim 25 wherein the radiator enables air-cooling of the hot liquid.

33. (New) The radiator of claim 25, further comprising a second sacrificial anode.

34. (New) The radiator of claim 25, wherein the hot liquid is coolant.

35. (New) The radiator of claim 25, wherein the hot liquid is water.

36. (New) The radiator of claim 25, wherein the hot liquid is antifreeze.

37. (New) An electrolysis prevention device for preventing corrosion, the electrolysis prevention device comprising:

a sacrificial anode made of an active metal; and

an anode holder supporting the sacrificial anode, the anode holder adapted for installation in an engine radiator within 10 inches of a hot liquid inlet to the engine radiator.

38. (New) The electrolysis prevention device of claim 37, wherein the sacrificial anode comprises aluminum.

39. (New) The electrolysis prevention device of claim 37, wherein the sacrificial anode comprises magnesium.

40. (New) The electrolysis prevention device of claim 37, wherein the sacrificial anode comprises zinc.

41. (New) The electrolysis prevention device of claim 37, wherein the engine radiator is used in a motor vehicle, and wherein the sacrificial anode is grounded to the motor vehicle.

42. (New) The electrolysis prevention device of claim 37, wherein the engine radiator comprises aluminum.

43. (New) The electrolysis prevention device of claim 37, wherein the anode holder enables the sacrificial anode to be located within fluid flow of the hot coolant inlet.

44. (New) The electrolysis prevention device of claim 37, wherein the anode holder is installed in a fitting hole penetrating the engine radiator.

45. (New) The electrolysis prevention device of claim 37, wherein the hot liquid is coolant.

46. (New) The electrolysis prevention device of claim 37, wherein the hot liquid is water.

47. (New) The electrolysis prevention device of claim 37, wherein the hot liquid is antifreeze.

REMARKS

Claims 1-47 were pending in the Reissue Application at the time the non-final Office Action was sent electronically on December 10, 2018 ("the Action"). With respect to the previously issued patent, U.S. Pat. No. 8,236,145 (the "'145 Patent"), claim 12 is amended, and claims 15-47 are new claims in the Reissue Application, which were also pending at the time of the Action.

Telephone Interview

The inventor, the attorney and patent agent for the inventor, the Examiner, and two supervisory Examiners participated in a telephone interview on January 9, 2019. The Examiner provided an interview summary on January 17, 2019. Applicant appreciates the constructive feedback provided by the Office during the telephone interview. The remarks and arguments presented here are intended to further clarify and formalize the distinctions over the prior art that were discussed during the telephone interview and are noted in the interview summary.

Legal Name Change of the Inventor

During pendency of the Reissue Application, the legal name of the inventor was changed to Frank Amidio Catalano. Documentation of the legal name change is submitted herewith along with an amended Application Data Sheet. The Office is requested to enter the legal name change of the inventor.

Rejections under 35 U.S.C. § 251

Claims 1-47 were rejected under Section 251 in the Action for being based on a defective reissue declaration. As discussed during the interview, Applicant is, with this response, filing a new reissue declaration executed by the inventor, which reflects the currently pending claims. In view of the new declaration, reconsideration and withdrawal of the rejection under Section 251 are respectfully requested.

Rejections Under 35 U.S.C. § 103

I. The Pending Claims Are Patentable Over *Gus*h in view of *Fahnestock*

The Action rejected claims 12, 17, 19, 21-25, 28, and 32-36 under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 1,514,903 to Gush ("*Gush*") in view of Murray Fahnestock, *Radiator Repairs, in Ford Care and Home Repair* (1922 ed.) ("*Fahnestock*"). As explained below, these claims are not obvious over *Gush* in view of *Fahnestock*.

Independent claims 12 and 25, and their respective dependent claims, are patentable over *Gush* in view of *Fahnestock,* because the cited references do not teach or suggest each of the features recited in those claims. Both of the independent claims require a "sacrificial anode" and, further, that the sacrificial anode is placed "within 10 inches of a hot liquid inlet" of the radiator. In particular, the independent claims recite:

> 12. A method of preventing corrosion of a radiator, the method comprising:
>
> installing a sacrificial anode assembly including *a sacrificial anode* within the radiator, *wherein the sacrificial anode is placed within 10 inches of a hot liquid inlet to the radiator*.
>
> 25. A radiator for use in a motor vehicle, the radiator further comprising:
>
> a hot liquid inlet to the radiator from an engine of the motor vehicle, the hot liquid inlet providing fluid communication for fluid flow of hot liquid from the engine; and,
>
> *a sacrificial anode installed within 10 inches of the hot liquid inlet of the radiator*.

(emphasis added). Neither *Gush* nor *Fahnestock*, alone or in combination, teach or suggest a "sacrificial anode," let alone that a "sacrificial anode" is placed "within 10 inches of a hot liquid inlet," as recited in independent claims 12 and 25.

Gush does not teach or suggest a "sacrificial anode." The term "sacrificial anode" does not appear anywhere in *Gush*, and, indeed, the Action does not cite *Gush* as disclosing a "sacrificial anode." Instead, in explaining the rejection of amended claim 12, for example, the Action states that "Gush teaches a radiator having an *anticorrosion electrode bar* extending across the top of the radiator." Action at 4 (*citing Gush* at Figs. 1-3; pg 1, ln 90-104; pg 2, ln 12-19, 35-44) (emphasis added). The Action does not explain how or why the "anticorrosion electrode bar" purportedly disclosed in *Gush* teaches or suggests the "sacrificial anode" claimed in independent claims 12 and 25.

Gush instead discloses an electrode that is connected to a source of electricity and is used to introduce current into the water in a radiator. *Gush* discloses an "electrode B" that passes through the wall of a radiator and extends, as a rod, across and within the top of the radiator. *Gush*, pg.1, ln. 89-98; pg. 2, ln. 12-19; Figs. 1-3. *Gush* discloses that the electrode is connected to the terminal of a lead, "lead H," and that "[t]he lead H is taken to a suitable source of electricity." *Id.*, pg. 1, ln. 108-110; Figs. 1-3. Consistent with its carrying a current, *Gush* repeatedly describes that the electrode is encased or carried in an "insulating material." *Id.*, pg. 1, ln. 23-35, 39-41, 52-58, 58-63, 89-94, 99-102; pg. 2, ln. 12-19. *Gush* also discloses that the electrode is part of a "electrolytic anticorrosion system" and that the electrode passes into "the structure containing the water to be subjected to the electrolytic action." *Id.*, pg. 1, ln. 52-58. In other words, the electrode disclosed in *Gush* introduces current into the water in a radiator to create electrolytic action.

The electrode disclosed in *Gush* is not, and does not suggest, a "sacrificial anode." A person of ordinary skill in the art would understand that a "sacrificial anode" is generally a piece of metal used to protect another from corrosion by preferentially corroding. For example, common definitions for "sacrificial anode" include:

- "an electropositive metal, such as zinc, that protects a more important electronegative part by corroding when attacked by electrolytic action" *Collins English Dictionary*, http://www.collinsdictionary.com /us/dictionary/english/sacrificial-anode (last visited Jan. 21, 2019).
- "an anode that is attached to a metal object subject to electrolysis and is decomposed instead of the object" *Dictionary.com*, http://www.dictionary.com/browse/sacrificial-anode (last visited Jan. 21, 2019).
- "highly active metals that are used to prevent a less active material surface from corroding. Sacrificial Anodes are created from a metal alloy with a more negative electrochemical potential than the other metal it will be used to protect. The sacrificial anode will be consumed in place of the metal it is protecting, which is why it is referred to as a 'sacrificial' anode." *LibreTexts Chemistry*, http://chem.libretexts.org/Bookshelves/Analytical_Chemistry /Supplemental_Modules_(Analytical_Chemistry)/Electrochemistry /Exemplars/Corrosion/Sacrificial_Anode (last visited Jan. 21, 2019).

The specification of the '145 Patent similarly explains that "sacrificial anodes, constructed of active metals, that is metals that react with oxygen, such as magnesium, aluminum, zinc or combinations thereof, have also been used as corrosion inhibitors" and further, that a "sacrificial anode is designed to be consumed." '145 Patent, col. 1, ll. 62-65, col. 2, l. 11. Nothing in *Gush*

describes the electrode it discloses as having any of these characteristics, e.g., being constructed of a relatively more active metal or being preferentially corroded or consumed.

Gush also does not teach or suggest placing a sacrificial anode "within 10 inches of a hot liquid inlet" as also recited in claims 12 and 25. *Gush* itself does not mention "a hot liquid inlet" at all, much less show where one would be in the figures the Action relies on in making the obviousness rejection. *Gush* also does not include any discussion or teaching about the importance or significance of the positioning of its electrode with respect to any other components of the radiator.

A person of ordinary skill in the art would also not look to *Gush* for a teaching, suggestion, or motivation to combine regarding the placement of a sacrificial anode in a radiator. As noted above, *Gush* does not include any discussion or teaching about the importance or significance of the position of its electrode in the radiator, and does not, itself, disclose anything about the position of its electrode with respect to the "hot liquid inlet" to the radiator. And, even if *Gush* did reveal something about the benefits of the position of its electrode—which it does not—a person of ordinary skill in the art would not rely on *Gush* for positioning a sacrificial anode, because *Gush* relates to an electrode used to introduce current into the water of a radiator, rather than a sacrificial anode. In other words, there is no reason, and the Action does not identify any, that one of skill in the art would substitute or equate the claimed sacrificial anode with the electrode in *Gush* or the position of the electrode in *Gush*.

For example, as discussed during the telephone interview, the claimed feature of placing the sacrificial anode "within 10 inches of a hot liquid inlet," as recited in amended claim 12, is based on the inventor's observation that corrosion in modern motor vehicle radiators tends to occur near the hot liquid inlet. This portion of the radiator, near the hot liquid inlet, is also subject to the highest operating temperatures, because the hot liquid inlet delivers the liquid with the highest temperatures from the engine into the radiator, where it is cooled before returning to the engine. The higher temperatures in the portion of the radiator near the hot liquid inlet would be expected to generally increase chemical reactivity, including corrosion reactions, leading to corrosion that the inventor observed. There is no such teaching or suggesting in *Gush*.

Fahnestock does not remedy the deficiencies of *Gush*. *Fahnestock* likewise does not teach or suggest a "sacrificial anode" or placing a sacrificial anode "within 10 inches of a hot liquid inlet" as required by claims 12 and 25. Indeed, *Fahnestock* does not disclose or relate to sacrificial

anodes at all. The Action only relies on *Fahnestock* to try to show where one of skill in the art would understand a hot water inlet would be positioned in the top of the radiator shown in Fig. 3 of *Gush*. Even when combined, *Gush* and *Fahnestock* do not lead to any teaching or suggestion of each of the limitations of claims 12 and 25, because, again, *Gush* and *Fahnestock* do not relate to sacrificial anodes and do not point toward any significance or benefit of the position of the *Gush* electrode with respect to a hot liquid inlet that one of skill in the art would rely on for positioning a sacrificial anode.

Because *Gush* and *Fahnestock* do not alone, or in combination, teach or suggest each of the elements of independent claims 12 and 25, there is not a *prima facie* case of obviousness, and Applicant respectfully requests withdrawal of the rejection of those claims under pre-AIA 35 U.S.C. § 103(a). For the same reasons, claims 17, 19, 21-24 (depending from claim 12) and claims 28, 29 and 32-36 (depending from claim 25) are also patentable and not obvious over *Gush* in view of *Fahnestock,* and Applicant respectfully requests withdrawal of the rejection of those claims as well. *See In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) (if an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending from it is also nonobvious); *see also* MPEP 2143.03.

II. The Pending Claims Are Patentable Over *Gush* in view of *Fahnestock* and further in view of *Guo*.

The Action rejected claims 15-16, 18, 26-27, 30, 37-41, and 43-47 under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over *Gush* in view of *Fahnestock*, and further in view of Guo Zhangeng ("*Guo*"). As explained below, those claims are not obvious over *Gush* in view of *Fahnestock* and further in view of *Guo*.

A. Dependent Claims 15-16, 18, 26, 27, and 30

Claims 15-16, 18, 26, 27, and 30 depend from claims 12 and 25, discussed above, and add limitations such as requiring that the sacrificial anode "consists essentially of an active metal," "consists essentially of aluminum, magnesium, or zinc," or "is grounded." Because, as the Action concedes, neither *Gush* nor *Fahnestock* disclose a sacrificial anode (i) made of an active metal, (ii) made of aluminum, magnesium, or zinc, or (iii) that is grounded, the Action only relies on *Guo* to try to assert that those limitations would have been obvious as well.

For the same reasons explained above with respect to *Gush* and *Fahnestock* for independent claims 12 and 25, the Action's proposed three-way combination of *Gush*, *Fahnestock*, and *Guo*

does not teach or suggest each of the limitations of claims 15-16, 18, 26, 27, and 30, all of which depend from claims 12 and 25. In particular, and as explained in full above, neither *Gush* nor *Fahnestock* disclose a "sacrificial anode" or that a "sacrificial anode" is placed "within 10 inches of a hot liquid inlet." *Guo* does not remedy those deficiencies—and the Action does not assert that it does—at least because *Guo* does not disclose a sacrificial anode placed "within 10 inches of a hot liquid inlet." For those reasons alone, dependent claims 15-16, 18, 26, 27, and 30 are also patentable and not obvious over *Gush* in view of *Fahnestock*, and further in view of *Guo*. *See In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) (if an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending from it is also nonobvious); *see also* MPEP 2143.03.

In addition, *Guo* is not, as the Action asserts, an "analogous teaching" that one of skill in the art would seek to combine with *Gush* and *Fahnestock*. Action at 8-9. To begin with, as noted above, *Gush* and *Fahnestock* do not teach or suggest a sacrificial anode, and, as such, one of skill in the art would not look to *Guo* to combine with *Gush* and *Fahnestock*. Action at 8-10. Moreover, *Guo* is directed to an entirely different type of equipment from the automotive applications disclosed in *Gush* and *Fahnestock*. *Guo* is directed to indoor "heating equipment" of the type typically installed for heating a building. *Guo* (translation) at 3. For example, *Guo* describes the radiators disclosed there as "leaking . . . about 80 tons of water a day" and that "water leakage can damage the furniture." *Id.* These types of indoor hot water radiators are used to safely heat a space, in contrast to the automotive radiators of *Gush* and *Fahnestock*, which were used to cool an internal combustion engine. *Gush*, pg. 1, ll. 15-19. As a result, the indoor hot water radiators of *Guo* have different designs, functions, and considerations than the automotive radiators of *Gush* and *Fahnestock*, including, for example, different materials, operating temperatures, and inlet and outlet temperature differentials. Consequently, a person of ordinary skill in the art would not look combine *Guo* with *Gush* and *Fahnestock*.

Because *Gush*, *Fahnestock*, and *Guo*, do not alone, or in combination, teach or suggest each of the elements of claims 15-16, 18, 26, 27, and 30, there is not a *prima facie* case of obviousness, and Applicant respectfully requests withdrawal of the rejection of those claims.

B. Independent Claim 37 and its Dependent Claims 38-41 and 43-47

Independent claim 37, and its respective dependent claims, are patentable over the combination of *Gush* in view of *Fahnestock*, and in further view of *Guo*, because the cited

references do not teach or suggest each of the features recited in those claims. Independent claim 37, and each of its dependent claims, require a "sacrificial anode," "made of an active metal," and that the sacrificial anode is placed "within 10 inches of a hot liquid inlet" to the radiator. In particular, the independent claim 37 recites:

> 37. An electrolysis prevention device for preventing corrosion, the electrolysis prevention device comprising:
>
> a *sacrificial anode made of an active metal*; and
>
> an anode holder supporting the sacrificial anode, the anode holder adapted for installation in an engine radiator *within 10 inches of a hot liquid inlet to the engine radiator*.

For the same reasons explained above with respect to claims 15-16, 18, 26, 27, and 30, the proposed three-way combination of *Gush*, *Fahnestock*, and *Guo* does not teach or suggest each of the limitations of claims 37-41 and 43-47. In particular, and as explained in full above, neither *Gush* nor *Fahnestock* disclose a "sacrificial anode" or that a "sacrificial anode" is placed "within 10 inches of a hot liquid inlet." *Guo* does not remedy those deficiencies—and the Action does not assert that it does—at least because *Guo* does not disclose a sacrificial anode placed "within 10 inches of a hot liquid inlet." Furthermore, as explained in full above, *Guo* is not an analogous teaching that one of skill in the art would seek to combine with *Gush* and *Fahnestock*. Consequently, *Gush*, *Fahnestock*, and *Guo*, do not alone, or in combination, teach or suggest each of the elements of claims 37-41 and 43-47, there is not a *prima facie* case of obviousness, and Applicant respectfully requests withdrawal of the rejection of those claims.

III. The Pending Claims Are Patentable Over *Gush*, *Fahnestock*, and *Green*

The Action rejected dependent claims 20 and 31 under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over *Gush* in view of *Fahnestock*, and further in view of U.S. 5,649,591 to Green ("*Green*"). Claims 20 and 31 depend, respectively, from independent claims 12 and 25, discussed above, and add only a limitation stating "wherein the radiator comprises aluminum." Because, as the Action concedes, neither *Gush* nor *Fahnestock* disclose an aluminum radiator, the Action only relies on *Green* to try to assert that an aluminum radiator would have been obvious as well.

For the same reasons explained above with respect to *Gush* and *Fahnestock* for independent claims 12 and 25, the Action's proposed three-way combination of *Gush*, *Fahnestock*, and *Green*

does not teach or suggest each of the limitations of claims 20 and 31, both of which depend from claims 12 and 25. In particular, and as explained in full above, neither *Gush* nor *Fahnestock* disclose a "sacrificial anode" or that a "sacrificial anode" is placed "within 10 inches of a hot liquid inlet." *Green* does not remedy those deficiencies—and the Action does not assert that it does—at least because *Green* does not disclose a sacrificial anode placed "within 10 inches of a hot liquid inlet." For those reasons alone, dependent claims 20 and 31 are also patentable and not obvious over *Gush* in view of *Fahnestock*, and further in view of *Green*, and Applicant respectfully requests withdrawal of the rejection of those claims. *See In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) (if an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending from it is also nonobvious); *see also* MPEP 2143.03.

IV. The Pending Claims Are Patentable Over *Gush*, *Fahnestock*, *Guo,* and *Green*

The Action rejected dependent claim 42 under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over *Gush* in view of *Fahnestock* and *Guo*, and further in view of *Green*. Claim 42 depends from independent claim 37, discussed above, and adds only a limitation stating "wherein the radiator comprises aluminum." Because, as the Action concedes, none of *Gush*, *Fahnestock,* or *Guo* disclose an aluminum radiator, the Action only relies on *Green* to try to assert that an aluminum radiator would have been obvious as well.

For the same reasons explained above with respect to *Gush*, *Fahnestock*, and *Guo* for independent claim 37, the Action's proposed four-way combination of *Gush*, *Fahnestock*, *Guo*, and *Green* does not teach or suggest each of the limitations of claims 42, which depends from claim 37. In particular, and as explained in full above, *Gush*, *Fahnestock,* and *Guo* do not disclose a "sacrificial anode" placed "within 10 inches of a hot liquid inlet." *Green* does not remedy those deficiencies—and the Action does not assert that it does—at least because *Green* does not disclose a sacrificial anode placed "within 10 inches of a hot liquid inlet." For those reasons alone, dependent claim 37 is also patentable and not obvious over *Gush* in view of *Fahnestock* and *Guo*, and further in view of *Green*, and Applicant respectfully requests withdrawal of the rejection of those claims. *See In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) (if an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending from it is also nonobvious); *see also* MPEP 2143.03.

CONCLUSION

It is believed that this is a full and complete response to all matters raised in the Office Action. Reconsideration and early allowance of all pending claims are respectfully requested.

Should the Examiner have any questions or consider a telephone call helpful, please feel free to contact the undersigned.

Respectfully submitted,

/Stephen C. Stout/

Stephen C. Stout
Reg. No. 61,326
Attorney for Applicant

Vinson & Elkins L.L.P.
1001 Fannin Street, Suite 2500
Houston, TX 77002-6760
512.542.8446
Date: February 18, 2019

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

21586 7590 04/26/2019
VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

EXAMINER	
VINCENT, SEAN E	
ART UNIT	PAPER NUMBER
3991	

DATE MAILED: 04/26/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Amidio Catalano	PET744/4-001REUS/58000	7313

TITLE OF INVENTION: Electrolysis Prevention Device and Method of Use

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	MICRO	$250	$0.00	$0.00	$250	07/26/2019

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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

21586 7590 04/26/2019
VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Amidio Catalano	PET744/4-001REUS/58000	7313

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APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	MICRO	$250	$0.00	$0.00	$250	07/26/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
VINCENT, SEAN E	3991	204-196370

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(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.

1 _____
2 _____
3 _____

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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
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.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	08/05/2014	Frank Amidio Catalano	PET744/4-001REUS/58000	7313

21586 7590 04/26/2019

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FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

EXAMINER	
VINCENT, SEAN E	

ART UNIT	PAPER NUMBER
3991	

DATE MAILED: 04/26/2019

Determination of Patent Term Extension or Adjustment under 35 U.S.C. 154 (b)

A reissue patent is for "the unexpired part of the term of the original patent." See 35 U.S.C. 251. Accordingly, the above-identified reissue application is not eligible for Patent Term Extension or Adjustment under 35 U.S.C. 154(b).

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.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B 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 30 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. 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.

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. 14/452,339	Applicant(s) Catalano, Frank Amidio	
	Examiner SEAN E VINCENT	Art Unit 3991	AIA (FITF) 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 response filed 2/18/2019.
   ☐ 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 1-47 . 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 areply 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)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/Sean E Vincent/ Patent Reexam Specialist, Art Unit 3991	/TIMOTHY M SPEER/ Supervisory Patent Examiner, Art Unit 3991

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: The prior art, alone or in combination, fails to teach or fairly suggest radiators, electrolysis prevention devices installed in engine radiators, or methods of preventing corrosion of a radiator wherein a sacrificial anode is installed within ten inches of a hot liquid inlet of the radiator as claimed in claims 12, 25 or 37. Likewise, the prior art does not teach or fairly suggest electrolysis prevention devices supported by anode holders adapted to fit around the inlet connection of an engine heat exchange component allowing for a hose to be attached over the device as claimed in claim 1. Also, the prior art does not teach or fairly suggest electrolysis prevention devices supported by anode holders adapted to fit through and around the inlet connection of an engine heat exchange component allowing for a hose to be attached to and around the inlet connection without dislodging the holder as claimed in claim 13. It would not have been obvious to modify the prior art radiators, devices and methods to arrive at the combinations embodied by claims 1, 12, 13, 25 or 37.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN E VINCENT whose telephone number is (571)272-1194. The examiner can normally be reached on 8:00am to 4:30pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean C Witz can be reached on 571-272-0927. 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.

/Sean E Vincent/
Patent Reexam Specialist, Art Unit 3991

Conferees:

/Terrence Till/
Patent Reexamination Specialist
Art Unit Central Reexam 3993

/TIMOTHY M SPEER/
Supervisory Patent Examiner, Art Unit 3991

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/452,339	Catalano, Frank Amidio
	Examiner	**Art Unit**
	SEAN E VINCENT	3991

CPC						
Symbol					**Type**	**Version**
C23F	/	13	/	18	F	2013-01-01
Y10T	/	428	/	23	A	2015-01-15
Y10T	/	29	/	4935	A	2015-01-15
C23F	/	2201	/	02	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	47	
/Sean E Vincent/ Primary Examiner, Art Unit 3991	12 April 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	12	4A

U.S. Patent and Trademark Office — Part of Paper No.: 20190412

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/452,339	Catalano, Frank Amidio
	Examiner	**Art Unit**
	SEAN E VINCENT	3991

INTERNATIONAL CLASSIFICATION				
CLAIMED				
C23F	/	13	/	10
C23F	/	13	/	18

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
204	196.37

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					
204	196.1	196.17	196.18	196.19	196.21	196.23
204	196.24	195.25	196.3	196.36	196.15	196.2
205	730	732	733	740		

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	47	
/Sean E Vincent/ Primary Examiner, Art Unit 3991	12 April 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	12	4A

U.S. Patent and Trademark Office — Part of Paper No.: 20190412

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/452,339	Catalano, Frank Amidio
	Examiner	**Art Unit**
	SEAN E VINCENT	3991

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	47	
/Sean E Vincent/ Primary Examiner, Art Unit 3991	12 April 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	12	4A

U.S. Patent and Trademark Office Part of Paper No.: 20190412

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/452,339	Catalano, Frank Amidio
	Examiner	**Art Unit**
	SEAN E VINCENT	3991

CPC - Searched*		
Symbol	**Date**	**Examiner**
see EAST search history	6-10-15	SV
above up to date	2-9-16	SV

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
see EAST search history	6-10-15	SV
prior prosecution and patent family reviewed	6-10-16	SV
above up to date	2-9-16	SV
SEE EAST SEARCH HISTORY	8-17-17	SV
searches UPDATED, prior prosecution history review UPDATED	1-30-18	SV
(sacrificial anode) (inlet) (radiator) before:priority:20081205 in google patents	1-30-18	SV
searches UPDATED, prior prosecution history review UPDATED	7-6-18	SV
all above up to date	11/27/2018	SV
google search "auto restoration parts supply"	11/29/2018	SV
EAST search updated	04/12/2019	SV

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/452,339	Catalano, Frank Amidio
	Examiner	Art Unit
	SEAN E VINCENT	3991

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	see EAST search history	04/12/2019	SV

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	4030	sacrificial near2 anode	US-PGPUB; USPAT; USOCR	OR	ON	2019/04/12 16:10
L2	614588	(radiator or (heat adj exchanger) or condenser)	US-PGPUB; USPAT	OR	ON	2019/04/12 16:11
L3	5952027	(mount or mounting or plug or attach or install or hang or holder or fitting)	EPO; JPO; DERWENT	OR	ON	2019/04/12 16:11
L4	10032659	@pd < "20081205"	US-PGPUB; USPAT	OR	ON	2019/04/12 16:12
L5	96	l1 near5 l2	US-PGPUB; USPAT	OR	ON	2019/04/12 16:13
L6	0	l3 and l5	US-PGPUB; USPAT	OR	ON	2019/04/12 16:13
L7	0	l1 and l2 and l3	US-PGPUB; USPAT	OR	ON	2019/04/12 16:13
L8	46	l4 and l5	US-PGPUB; USPAT	OR	ON	2019/04/12 16:13

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L9	473	sacrificial near2 anode.clm.	USPAT	OR	ON	2019/04/12 16:14
L10	76516	(radiator or (heat adj exchanger) or condenser).clm.	USPAT	OR	ON	2019/04/12 16:14
L11	760945	(mount or mounting or plug or attach or install or hang or holder or fitting).clm.	USPAT	OR	ON	2019/04/12 16:14
L12	29	l9 and l10	USPAT	OR	ON	2019/04/12 16:14
L13	80	l9 and l11	USPAT	OR	ON	2019/04/12 16:15
L14	3	l12 and l13	USPAT	OR	ON	2019/04/12 16:15

4/ 12/ 2019 4:17:03 PM
C:\ Users\ svincent\ Documents\ EAST\ Workspaces\ 14452339.wsp

UNITED STATES PATENT AND TRADEMARK OFFICE

Reissue Terminal Disclaimer Review Form

Application No.	Art Unit:
14/452,339	3991

Examiner: Sean E Vincent

Original Patent Number of Patent to be Reissued is: 8236145

The Maintenance fee status is:

- (•) up to date.
- ( ) not up to date. (Consult with SPRS)

Is there a terminal disclaimer filed and accepted during the prosecution of (i) the current reissue application, (ii) the underlying patent, and/or (iii) reexamination proceeding(s) of the underlying patent?

- (•) NO
- ( ) YES (Complete the rest of the form)

This reissue patent is subject to Terminal Disclaimer(s) that was/were:

☐ filed and accepted (DISQ or DISQ.E.FILE) during the prosecution of the current reissue application. (Enter terminal disclaimer(s) filing date(s) below).

1. _____ 2. _____ 3. _____

The underlying patent of the current reissue application is subject to Terminal Disclaimer(s) that was/were:

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1. _____ _____ 2. _____ _____ 3. _____ _____

(**Examiner's note:** Assign Doc Code "REIS.REVFORM" to this form.)

U.S. Patent and Trademark Office — Last revised: 12/2016

Bibliographic Data

Application No: 14/452,339

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /Sean E Vincent/ (Examiner's Signature) | (Initials)

Title: Electrolysis Prevention Device and Method of Use

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
08/05/2014	204	3991	PET744/4-001REUS/58000
RULE			

APPLICANTS

INVENTORS

Frank Amidio Catalano Concord, NC, UNITED STATES

CONTINUING DATA

This application is a REI of 12631903 12/07/2009 PAT 8236145

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

09/19/2014

**** MICRO ENTITY ****

STATE OR COUNTRY

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ADDRESS

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FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760
UNITED STATES

FILING FEE RECEIVED

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Application	Document	Mailroom Date	Attorney Docket No.
14452339	NOA	04/26/2019	PET744/4-001REUS/58000

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Document Description: Issue Fee Payment (PTO-85B)

Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
14452339	05-Aug-2014	Frank Catalano	PET744/4-001REUS/58000	7313

TITLE OF INVENTION :

Electrolysis Prevention Device and Method of Use

Entity Status	Application Type	Art Unit	Class - Subclass	EXAMINER
Micro	Utility under 35 USC 111(a)	3991	196370	SEAN VINCENT

Issue Fee Due	Publication Due	Total Fee(s) Due	Date Due	Prev. Paid Fee
$250	$0	$250	26-Jul-2019	$0

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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.

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Signature	/Stephen C. Stout/	**Date**	05-09-2019
Name	Stephen Charles Stout	**Registration Number**	61326

Electronic Patent Application Fee Transmittal

Application Number:	14452339
Filing Date:	05-Aug-2014
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Amidio Catalano
Filer:	Stephen Charles Stout/Bobbie Melder
Attorney Docket Number:	PET744/4-001REUS/58000

Filed as Micro Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
REISSUE ISSUE FEE	3511	1	250	250
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**250**

Electronic Acknowledgement Receipt	
EFS ID:	35970882
Application Number:	14452339
International Application Number:	
Confirmation Number:	7313
Title of Invention:	Electrolysis Prevention Device and Method of Use
First Named Inventor/Applicant Name:	Frank Amidio Catalano
Customer Number:	21586
Filer:	Stephen Charles Stout/Bobbie Melder
Filer Authorized By:	Stephen Charles Stout
Attorney Docket Number:	PET744/4-001REUS/58000
Receipt Date:	09-MAY-2019
Filing Date:	05-AUG-2014
Time Stamp:	17:52:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$250
RAM confirmation Number	051019INTEFSW00004438220365
Deposit Account	220365
Authorized User	Bobbie Melder
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Web85b.pdf	45713 8affadec31b556e1af85b5612049182c11f8e3cc	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32175 a4e73e709f212653e7f673a1ab6384b4559c7558	no	2
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Doc Code: IFEE

PTOL/85B-EFS

Document Description: Issue Fee Payment (PTO-85B)

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Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
14452339	05-Aug-2014	Frank Catalano	PET744/4-001REUS/58000	7313

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Signature	/Stephen C. Stout/	**Date**	05-09-2019
Name	Stephen Charles Stout	**Registration Number**	61326

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01 FC:3511 250.00 DA

Amendment to the Specification

Change(s) applied to document, /J.M.N./ 5/3/2019

Please insert the following substitute paragraph at [0029] on page 9 of the originally filed application (col. 6, lines 10-27 ~~1-28~~ of the issued patent).

[0029] FIG. 1A is a left side cross-sectional view of a radiator **11** having an electrolysis prevention device **12** in accordance with a first preferred embodiment of the present invention. As shown therein, an electrolysis prevention device **12** includes a sacrificial anode **13** supported at the end of a sleeve wire, metal slide, clip **15** or the like such that the anode is disposed adjacent the radiator inlet **17**. The anode 13 should be composed of a metal that reacts strongly with oxygen, also known as an active metal, such as magnesium, aluminum, zinc or combinations thereof. The anode support **19** extends through and out the radiator inlet and is doubled back around the inlet [fitting] connection **16**. The radiator hose **21** slides over the inlet [fitting] connection **16** and is clamped in place. The exposed end **23** of the anode support **19** optionally may be connected via ground wire (not shown) to the wiring harness, a suitable grounded location on the frame or cross member of the vehicle, or the like. However, grounding of the anode is not a necessary aspect of this embodiment, or any embodiment, of the present invention.

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/452,339	07/09/2019	RE47494	PET744/4-001REUS/58000	7313

21586 7590 06/19/2019

VINSON & ELKINS, L.L.P.
FIRST CITY TOWER
1001 FANNIN STREET, SUITE 2500
HOUSTON, TX 77002-6760

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Extension or Adjustment under 35 U.S.C. 154 (b)

A reissue patent is for "the unexpired part of the term of the original patent." See 35 U.S.C. 251. Accordingly, the above-identified reissue application is not eligible for Patent Term Extension or Adjustment under 35 U.S.C. 154(b).

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 Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Frank Amidio Catalano, Concord, NC;

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IR103 (Rev. 10/09)

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14452339	ISSUE.NTF	06/19/2019	PET744/4-001REUS/58000

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