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To the Director of the U.S. Patent and

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uments or the new address(es) below.

1. Name of Conveying Party(ies)

Micrologic, Inc.

Additional names(s) of conveying party(ies) attached? ☐ Yes ☒ No

3. Nature of Conveyance/Execution Date(s):

Execution Date(s) Aug 4, 2008

- ☒ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Joint Research Agreement ☐ Other
☐ Government Interest Assignment
☐ Executive Order 9424, Confirmatory License

2. Name and Address of Receiving Party(ies)

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Country: USA Zip: 75248

Additional names(s) & address(es) attached? ☐ Yes ☒ No

4. Application or Patent Number(s):

A. Patent Application No.(s)

10/117,548

☐ This document is being filed together with a new application.

B. Patent No.(s)

US Patent #6,735,150

Additional numbers attached? ☐ Yes ☒ No

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6. Total number of Applications and Patents involved: 1

7. Total Fee:(37 CFR 1.21(h) & 3.41) \$ \$40.00

- ☐ Authorized to be charged by Credit Card
☐ Authorized to be charged to Deposit Account
☒ Total Fee Enclosed
☐ None required (Government Interest Not Affecting Title)

8. Payment Information:

a. Credit Card Last 4 Numbers NA

Expiration Date NA

b. Deposit Account Number NA

Authorized User Name NA
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9. Signature: Sheldon Apse
SHELDON APSELL, President of Micrologic, Inc.

Name of Person Signing

Date: Aug 4 2008
Total Number of Pages Including Cover Sheet, Attachments and Documents 7

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0140, or mailed to:
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O.Box 1450, Alexandria, V.A. 22313-1450

ASSIGNMENT

In consideration of the sum of One Dollar (\$1.00) or equivalent and other good and valuable consideration paid to the undersigned, MICROLOGIC, INC., a Massachusetts corporation, 80-A Turnpike Road, Westborough, Worcester County, Massachusetts 01581 (the "Assignor") the undersigned hereby sells and assigns its entire right, title and interest to CUMBERLAND CONTINENTAL CORP. (the "Assignee"), a corporation organized and existing under the laws of the State of Nevada, having its principal place of business at 6867 Anglebluff Circle, Dallas, Dallas, County, Texas for

Check applicable box(es): ☒ the United States of America (as defined in 35 U.S.C. § 100),
 ☒ and throughout the world,

in the invention known as: "A novel technique for distinguishing fuel-operated engine idling and working periods by monitoring the different values of the engine alternating-current alternator frequencies for distinguishing engine idling and working, and, where desired, total engine operating run time." Said invention is more fully described on Exhibit "A" attached hereto which is made a part hereof as though fully set forth therein.

filed March 28, 2002 (also known as U.S. Application Serial No. 10/117,548, now U.S. Patent No. 6,735,150), in any and all applications thereon, in any and all Letters Patent(s) therefor, and in any and all reissues, extensions, renewals, reexaminations of such applications or Letters Patent(s) and divisionals and continuing applications thereof to the full end of the term or terms for which such Letters Patent(s) issue, such entire right, title and interest to be held and enjoyed by the above-named Assignee to the same extent as they would have been held and enjoyed by the undersigned had this assignment and sale not been made.

The undersigned agrees to execute all papers necessary in connection with the application and any continuing, divisional, reissue, reexamination or corresponding applications thereof and also to execute separate assignments in connection with such applications as the Assignee may deem necessary or expedient.

The undersigned agrees to execute all papers necessary in connection with any interference that may be declared concerning the application or any continuing, divisional, reissue, or reexamination applications thereof and to cooperate with the Assignee in every way possible in obtaining evidence and going forward with such interference.

The undersigned hereby represents that they have full right to convey undersigned entire interest herein assigned, and that they have not executed, and will not execute, any agreement in conflict therewith.

IN WITNESS WHEREOF, executed by the undersigned on the date opposite his name.

ASSIGNOR:

Date: Aug 4, 2008

MICROLOGIC, INC.
a Massachusetts Corporation

BY: Sheldon Apsell
SHELDON APSELL President
Sheldon Apsell

STATE OF MASSACHUSETTS :
SS
COUNTY OF WORCESTER :

On this 4th day of August 2008, before me personally appeared **Sheldon Apsell**, President of Micrologic, Inc., a Massachusetts corporation, known to me to be the same individual who executed the foregoing Assignment, and who acknowledged to me that he executed same of his own free will for the use and purposes therein set forth.

[Signature]
Notary Public In And For
The State of Massachusetts



SCOTT R. MCCARTHY
Notary Public
Commonwealth of Massachusetts
My Commission Expires Feb. 15, 2013

Method of and apparatus for distinguishing engine idling and working hours

Abstract

A novel technique for distinguishing fuel-operated engine idling and working periods by monitoring the different values of the engine alternating-current alternator frequencies for distinguishing engine idling and working, and, where desired, total engine operating run time.

Inventors: Rothman; Steven (Bolton, MA)
Assignee: Micrologic, Inc. (Westborough, MA)
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Filed: March 28, 2002

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Current International Class: G07C 5/00 (20060101); G07C 5/04 (20060101); G04F 010/00 (); G04F 008/00 ()
Field of Search: 368/1,5-10

References Cited [Referenced By]

U.S. Patent Documents

<u>3965669</u>	June 1976	Larson et al.
<u>4999820</u>	March 1991	Hetzel
<u>5617373</u>	April 1997	Kawai et al.
<u>6252823</u>	June 2001	McDonald et al.

Primary Examiner: Miska; Vit W.
Attorney, Agent or Firm: Rines and Rines

Claims

What is claimed is:

1. A method of measuring fuel-operated engine running hours, that comprises, monitoring the values of the frequencies corresponding to the engine speed over time, and processing the same to distinguish frequencies representative of either the engine idling periods or of the total period of engine operation, and frequencies representative of engine-working periods, thereby to enable the measurement of engine-

EXHIBIT "A"

working hours.

2. The method of claim 1 in which the frequency monitor monitors an alternating-current alternator provided for the engine.
3. The method of claim 1 wherein the total period of engine operation is processed by monitoring a frequency common to both engine working and idling.
4. The method of claim 3 wherein said common frequency is of the order of 50 Hertz.
5. The method of claim 1 wherein the engine idling period frequencies including from about 300--300 Hertz and the engine working period frequencies include about 500-600 Hertz.
6. A method of distinguishing fuel-operated engine idling and working periods, that comprises, monitoring the different values of the frequencies corresponding to engine idling and working speeds, and distinguishing such periods by such different frequency values, and communicating the distinguishment.
7. Apparatus for measuring fuel-operated engine running hours, having, in combination, a frequency monitor for monitoring the values of frequencies corresponding to engine speed over time, and means for processing the monitored values to distinguish frequencies representative of idling periods and frequencies representative of engine-working periods, thereby to enable the determination of engine-working hours.
8. The apparatus of claim 7 in which the frequency monitor monitors an alternating-current alternator provided for the engine.
9. The apparatus of claim 7 wherein the processing means monitors a frequency common to both engine working and idling, thereby to measure the total period of engine operation, and further monitors the frequencies representative of the engine-working periods wherein the total engine run hours equals the sum of the engine working and idling periods.

Description

FIELD

The present invention relates to the monitoring of engine working hours, such as vehicle and other fuel-driven engines, as for the purpose of monitoring the total work done by the engine, and, if desired, for scheduling maintenance and fuel delivery and for similar purposes.

BACKGROUND

Among the conditions sensed locally at vehicle engines are run hours--particularly important for monitoring the total work done by the engine, and, if desired, for scheduling fuel delivery and maintenance. Such scheduling, however, is impaired if there is no distinguishing between idling hours and working hours, including taking into account different workloads being performed that bear upon fuel consumption and engine wear and the like.

An approach to trying to ascertain these different running conditions is the monitoring of fuel consumption. Such sensing, however, is not only complex, but it is not really definitive in distinguishing information on idling vs. varying load working. This approach can thus generate an inaccurate metric of the total work done by the engine--for example, for scheduling maintenance needs.

In accordance with the present invention, on the other hand, distinguishing the conditions of the engine running idling from the engine actually working, and with different degrees of working loads, is attained through monitoring the alternating-current frequency of the engine alternator that corresponds to the engine speed (revolutions per minute). That frequency varies over time with engine operation--say, from relatively lower frequencies, say about 200-300 Hertz, or even lower frequencies, as characteristic of idling; and, above that threshold, up to higher frequencies of about 500-600 Hertz, more or less, for substantial fuel-consuming working of the engine on loads.

OBJECTS OF INVENTION

The principal object of the invention, accordingly, is to provide a new and improved method of and apparatus for differentiating and indicating engine idling periods with little fuel consumption, and periods of engine working under load and substantially consuming fuel, and that shall not be subject to the limitations of the above-described fuel-tank measurements and other prior approaches; but that, to the contrary, through monitoring the frequencies of the engine alternator corresponding to the engine speed over time, provides improved measurement of engine substantial fuel-consuming work run-hour measurements.

Other and further objects will be explained hereinafter and are more fully delineated in the appended claims.

SUMMARY

In summary, however, the invention contemplates a method of measuring fuel-operated engine running hours, that comprises, monitoring the values of the frequencies corresponding to the engine speed over time, and processing the same to distinguish frequencies representative of engine idling periods and frequencies representative of engine-working periods, thereby to enable the measurement of engine-working hours.

Preferred and best mode implementations are later detailed.

DRAWINGS

The invention will now be described in connection with the accompanying drawing the single figure of which is a block and circuit diagram showing the invention in preferred form.

PREFERRED EMBODIMENT OF THE INVENTION

Referring to the drawing, the alternating-current frequency signal of the engine alternator, as before mentioned, is of a frequency that varies with the engine speed or revolutions per minute (rpm)--ranging from the before-mentioned relatively low idling frequencies of up to about 200-300 Hertz, to higher working engine frequencies of about 600 Hertz, more or less. The alternator frequency is monitored at 1 and fed to a comparator 2 at A for comparison with a frequency at B that represents the threshold frequency selected to distinguish engine idling speeds from working speeds--say, for example, about 350

Hertz. The respective periods of time when comparator input A is greater than or less than this threshold ($A > B$, $A < B$), is processed in accumulators A.sub.A and B.sub.B, respectively, thereby to provide measures of and determination and distinguishment between the working and idling hours, as for communicating to a maintenance or service center or the like.

Alternatively, instead of accumulating separately both working and idling hours, the work hour frequencies may be accumulated to A.sub.A and the total running hours of the engine operation at any and all speeds which may be monitored at a frequency common to both engine working and idling, such as about 50 Hz, may be accumulated at B.sub.B, wherein the total engine run hours will equal the sum of the working and idling hours.

This methodology of distinguishing engine idling and load or work running hours is broadly applicable, including with other types of engine rpm indicators, as well. A specific important application is use in the setting of the different remote geographic locations of engine equipments such as construction equipments and the like.

Further modifications will also occur to those skilled in this art and such are considered to fall within the spirit and scope of the invention as defined in the appended claims.

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