

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CUB ELECPARTS INC.

Petitioner

v.

ORANGE ELECTRONIC CO., LTD.

Patent Owner

Patent No. 8,031,064 C3

IPR2024-00744

PETITION FOR *INTER PARTES* REVIEW OF

U.S. PATENT NO. 8,031,064 C3

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TABLE OF AUTHORITIES

Statutes:

35 U.S.C. § 102(b)

35 U.S.C. § 103(a)

35 U.S.C. § 314(a)

35 U.S.C. §325(d)

LIST OF EXHIBITS

Exhibit Number	Exhibit Content
1001	US Patent 8,031,064 C3 (Yu)
1002	US Patent 7,518,495 (Tang)
1003	US Patent Pub. 2005/0104722 (Tang)
1004	US Patent 6,941,801 (Lemense)
1005	JP 2006/15832 and Translation (Matsui)
1006	US Patent Pub. 2006/0136782 (Corniot)
1007	Declaration of Dr. Tom Qingfeng Tang
1008	USPTO Patent Center Screenshot (7,518,495)
1009	Taiwan Patent Office Invalidation Proceedings (Translated)

I. INTRODUCTION

CUB Elecparts, Inc., Petitioner, requests inter partes review of claims 16-19, 21, and 23-29 (all claims in force) of U.S. Patent No. 8,031,064 C3 (“the ‘064 patent” Ex-1001), assigned to Orange Electronic Co. Ltd. (“Patent Owner”). The ‘064 patent was filed in the United States on September 17, 2008.

Tire pressure monitoring systems (“TPMS”) use tire pressure monitors that are positioned within motor vehicle wheels, such as cars, and wirelessly transmit measured pressure to a receiver within the car. Different car manufacturers use different tire pressure monitors with different wireless frequencies and signal formats. These tire pressure monitors installed by the car manufacturer are called Original Equipment Manufacturer parts or OEM parts.

When a car owner needs to replace an OEM tire pressure detector, the car owner needs to buy either an OEM detector for that car model or must find a compatible detector, which is difficult due to the wide variety of detectors and formats that are used in cars.

The Orange patent relates to solving this problem with an “aftermarket” detector and setting tool that can be programmed with the code of any car manufacturer so that it can replace the original OEM detector in the car tire. Aftermarket parts refer to those car parts that are manufactured by a company other than the original car manufacturer and are typically designed for use by as many car

models as possible. In this manner, a repair shop need only stock a few aftermarket parts and still repair a wide range of car models.

The Orange patent provides a writeable aftermarket detector that can be programmed with the ID from the old OEM tire pressure detector to be replaced. In the Orange patent, a setting tool copies the old ID from the OEM detector and writes it into the replacement writeable aftermarket detector.

Previous reexaminations and IPR requests attempted to combine references relating to TPMS OEM parts/systems and aftermarket parts/systems. Since these different classes of devices/systems are meant to accomplish very different purposes, the attempted combination of these references was confusing and, ultimately, was found not show the aftermarket system of the '064 patent claims.

In contrast, this request primarily relies on two references: an aftermarket system composed of a writeable tire pressure detector, US 7,518,495/US 2005/0104722 to Tang (Exs. 1002-1003, newly cited), and a setting tool for the Tang detector, US 6,941,801 to Lemense (Ex. 1004). Lemense explicitly states that their tool is to be used with the aftermarket writeable Tang tire pressure detector such that, together, these two references form the single aftermarket TPMS replacement system. This aftermarket system, itself the largest selling commercial aftermarket TPMS system (Schrader EZ tool and EZ detector- please see the Tang Declaration, Ex. 1007, Appendix 2), is the same system claimed in the Orange patent. For this

reason, it is respectfully submitted that the current request differs from all previous *ex parte* and *inter partes* requests, and should be granted, resulting in the cancellation of all claims in force, claims 16-19, 21, and 23-29.

II. MANDATORY NOTICES

A. Real Party-in-Interest

Petitioner CUB Elecparts Inc. is the real party-in-interest.

B. Related Matters:

1. Taiwan Intellectual Property Office (TIPO)

The '064 patent has a Taiwan counterpart patent (priority is not claimed from this patent) that has been the subject of several invalidation proceedings involving the petitioner. All granted claims in that patent have been finally invalidated as of January 24, 2024 when Orange's appeal was denied. An overview of those proceedings and the TIPO decisions (translated) is discussed below in Section X.

2. Eastern District of Texas

The '064 patent is the subject of recent patent litigation in the Eastern District of Texas, Orange Electronic Co. Ltd. v. Autel Intelligent Technology Corp., Ltd. resulting in a jury verdict of infringement in favor of the Patent Owner on June 8, 2023.

3. Previous Ex Parte Reexaminations

The '064 patent was the subject of three previous ex parte reexaminations, 90/012,430, 90/013,169, and 90/014,362, in which various claims were canceled and/or amended.

4. Previous Inter Partes Request

The previous Inter Partes Request, by Autel Intelligent Technology Corp., Ltd., in which institution was denied, is IPR2021-01545.

C. Counsel and Service Information - §42.8(b)(3), (4)

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III. GROUNDS FOR STANDING AND FEES

Petitioner certifies that pursuant to 37 C.F.R. §42.104(a) the '064 C3 patent is available for inter partes review and the Petitioner is not barred or estopped from requesting this inter partes review based on the grounds identified below. The fees set forth in 37 C.F.R. §§42.15(e) and 42.103 accompany this Petition.

IV. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

Pursuant to Rules 42.22(a)(1) and 42.104(b)(1)-(2), Petitioner challenges claims 16-19, 21, and 23-29 (all pending claims) and requests their cancellation.

A. Prior Art

The '064 has a filing date of September 17, 2008 (pre-AIA), no other priority date is claimed. Petitioner's challenge is based on the following references:

1. U.S. Published Patent Application 2005/0104722; Patent No. 7,518,495 (Tang, Exs-1002-1003) Newly Cited

Tang, entitled “Universal Tire Pressure Monitor” was filed November 18, 2003; the application was published May 19, 2005; the patent was granted April 14, 2009. The published application is prior art under 35 U.S.C. 102(b) (pre-AIA); citations below are to the granted patent for more convenient column/line number reference.

2. U.S. Patent 6,941,801 (Lemense, Ex-1004)

Lemense, entitled “Tire Pressure Monitoring System” was filed December 19, 2003 and granted September 13, 2005. It is prior art under 35 U.S.C. 102(b).

3. JP 2006-15832 (Matsui, Ex-1005) Newly Cited

Matsui, entitled, “Method for setting a transmitter identifier by a setting device having a unique identifier and tire pressure monitoring system” was published on January 19, 2006. It is prior art under 35 U.S.C. 102(b).

4. U.S. Patent Publication 2006/0136782 (Corniot Ex-1006)

Corniot, entitled “Method and Device for Treating a Set of Components for the Wheel of the Vehicle” claims priority to a PCT application filed April 7, 2004 and was published June 22, 2006. It is prior art under 35 U.S.C. 102(b).

B. Relief Requested

Petitioner requests cancellation of the challenged claims as unpatentable under 35 U.S.C. 103. Note that since Lemense explicitly states that their patented setting tool is for use with the patented detectors of Tang, the combination is taught by the references themselves. All claims 16-19, 21, and 23-29 are unpatentable under 35 U.S.C. 103 over the Tang/Lemense system supported by disclosures of Matsui and Corniot and the Declaration of Tang (Ex-1007) which explains why the combination of Tang and Lemense is a single system based on the statements in Lemense.

V. THE '064 PATENT

A. Patent Embodiments

The '064 patent relates to a tire pressure detecting system with two components: a rewriteable pressure detector (element 10 of '064 FIG. 1) and a setting apparatus (element 20 of '064 FIG. 1) that writes an ID into the rewriteable pressure detector:

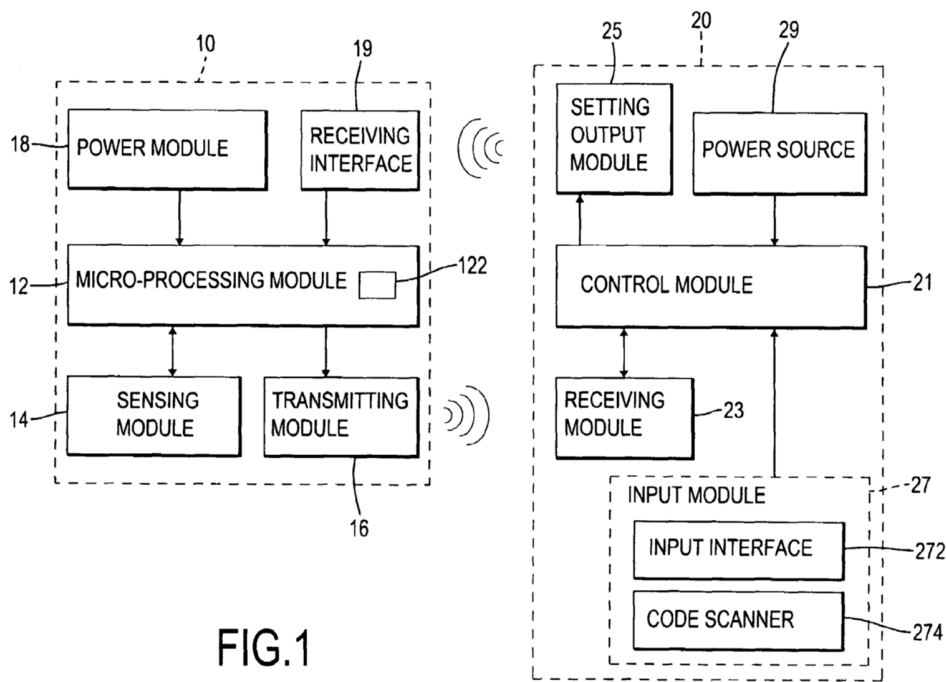


FIG.1

As stated in the '064 patent "The primary objective of the present invention is to provide a tire pressure detecting apparatus which is identification rewriteable thereby an new tire pressure detector can be easily replaced a failure tire pressure detector by cop[y]ing the identification of the failure tire pressure detector directly" (Ex-1001, 1:65-2:2).

The '064 patent identifies the problem with replacing tire pressure detectors: "However, tire pressure detectors have different installation methods depending on the manufacturers of the tire pressure detectors, to request an original manufacturer for installing a new tire pressure detector is necessary but troublesome" (Ex-1001, 1:20-24) and "Flexibility and convenience of changing the tire pressure detector (74)

are not good since users have to look for specific service centers that have the setting apparatus (90) to change the tire pressure detectors (74)” (Ex-1001, 1:54-58)

The identification rewritable tire pressure detector 10 includes a micro-processing module 12, a sensing module 14, a transmitting module 16, a power module 18, and a receiving interface 19. (Ex-1001, 2:34-3:28, Fig. 1). The micro-processing module 12 has a rewritable memory unit 122 capable of recording an identification. (Ex-1001, 2:43-50). The sensing module 14 is electrically connected to the micro-processing module and has a pressure-detecting unit that detects a pressure and sends a detection result to the micro-processing module. (Ex-1001, 2:51-64). The transmitting module 16 is controlled by the micro-processing module to transmit a radio frequency (“RF”) signal including the detection result and an identification of the identification rewritable tire pressure detector. (Ex-1001, 2:65-3:2). The power module 18 is electronically connected to the micro-processing module and provides electric power to the identification rewritable tire pressure detector. (Ex-1001, 3:3-5). The receiving interface 19 is electronically connected to the micro-processing module and receives an external signal and sends it to the micro-processing module. The external signal includes an external identification to be written into the rewritable memory. (Ex-1001, 3:6-28).

The setting apparatus 20 communicates with the identification rewritable tire pressure detector 10 and includes a control module 21. (Ex-1001, 3:29-34). The

input module 27 is electronically connected to the control module and allows an identification to be keyed in through an input interface (e.g., a keyboard) or scanned in through a code scanner (e.g., barcode). (Ex-1001, 3:53-4:3). The receiving module 23 is electronically connected to the control module and receives the RF signal from the identification rewritable tire pressure detector and sends the RF signal to the control module, thereby providing the control module with the identification. (Ex-1001, 3:35-42). The setting output module 25 is controlled by the control module to send the external signal to the receiving interface of the detector, where the external signal includes the identification that is provided by the input module or receiving module. (Ex-1001, 3:43-52; 4:15-32). The power source 29 is electronically connected to the control module. (Ex-1001, 4:4-6).

In use, the '064 patent reads an old ID from an old tire pressure detector (e.g., OEM detector) using the setting apparatus. The setting apparatus then writes this ID to the new ID rewriteable tire pressure detector. After writing, the setting apparatus judges the consistency of the ID and, optionally, repeats the process, as shown in '064 FIG. 3:

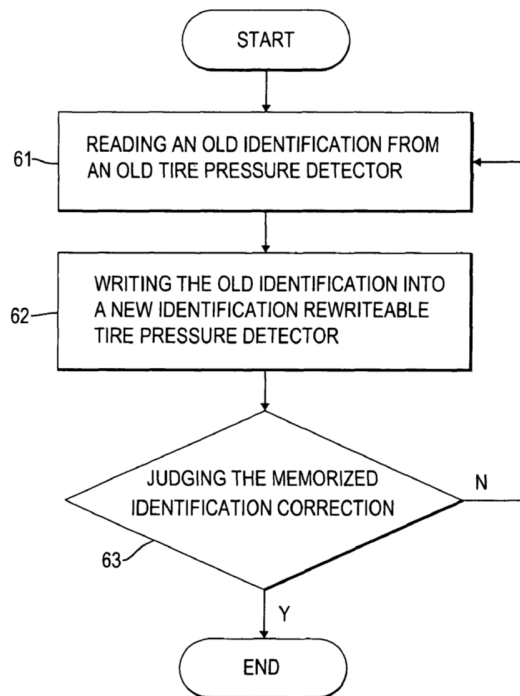


FIG.3

B. Prosecution History

During examination, the Examiner issued a first Office action in view of U.S. Patent No. 6,927,679 (“Taguchi”). The Applicant responded on March 29, 2011, by amending claim 1 to require that the setting apparatus include “an input module being electronically connected to the control module and allowing an operator to input an identification to be written into the identification rewritable tire pressure.” In the Remarks, the input module was described as receiving an identification captured from a source tire pressure sensor. Further, since the input module 27 was described as performing a different operation from that of Taguchi, Applicant argued that the ID registration tool 60 and the ID receiving section 61 of Taguchi

was different from the claimed input module. A Notice of Allowance was issued on June 9, 2011 and the patent published on October 4, 2011 with 13 claims.

The '064 Patent has been the subject of three ex parte reexaminations. In the first reexamination, claims 1-7 and 9 were cancelled, claims 8 and 10-13 were confirmed, and new claims 14 and 15 were added. In the second reexamination, claims 8 and 10-15 were cancelled and new claims 16-25 were added. In the third reexamination, claims 20 and 22 were cancelled, claims 16-19, 21, and 23-25 were amended, and new claims 26-29 were added.

In the third reexamination, various claims include a new limitation of “judging, by the setting apparatus, consistency of the update information newly recorded in the rewriteable memory unit and the old identification of the old tire pressure detector.” This limitation was cited by the Examiner in the “Reasons for Allowance in which the Examiner stated that a reference used in that reexamination, US 6,920,785 to Toyofuku, does not show that the writing device judges the consistency of the update identification newly recorded in the rewriteable memory unit and the old identification of the old tire pressure sensor, rather it just verifies completion of the input of data.

The absence of this feature was an important reason cited in the previous IPR request by Autel for the refusal to institute their IPR.

Following the three reexaminations, the remaining/added claims are claims 16-19, 21, and 23-29, all of which are requested to be canceled.

It is important to note that the present request does not repeat any of the grounds for unpatentability set forth in any previous request as it relies on new prior art; the previously-relied upon prior art, Lemense, is used in an entirely new combination with Tang as a single system embodiment as set forth in Lemense.

VI. PERSON OF ORDINARY SKILL IN THE ART (“POSA”)

A person of ordinary skill in the art would have a bachelor’s degree in electrical engineering and at least one year of experience in sensor/detector design or RF communications (RFIDs). This person would have a working knowledge of tire pressure management systems and, as most POSA would also be automobile owners, would have had personal experience with tire pressure management systems which have been required in all new cars, trucks, and SUVs in the United States since 2007. Education may substitute for experience and vice versa.

VII. CLAIM CONSTRUCTION

The claims should be accorded their ordinary and customary meaning.

With respect to the term “detector,” it is noted that all tire pressure detectors include pressure sensing modules. As such, in some references, the term “detector”

is used to describe the device and, in other references, the word “sensor” is used. Still other references use the term “monitor” since “TPMS” stands for “tire pressure monitoring system.” Some references use multiple terms. All these terms relate to the same device- that is, the device that is installed in the tire and transmits tire pressure signals. This Petition uses these terms interchangeably as they relate to the same devices.

VIII. GROUNDS

Ground 1: The Tang/Lemense system renders obvious claims 26, 27, and 28 under 35 U.S.C. 103.

Ground 2: The Tang/Lemense system renders obvious claims 16, 18, 21, 23, 24, and 29 under 35 U.S.C. 103 with Matsui further explaining what is involved in “judging consistency” of a newly-written ID with an old (copied) ID that was transmitted to be written into the sensor/detector.

Ground 3: Claims 17, 19, and 25 are rendered obvious by the Tang/Lemense system with Matsui further explaining what is involved in “judging consistency” of an ID written into the sensor with Corniot demonstrating that a bar code scanner is a known way to read pressure sensor labels in tire maintenance tools, explaining the meaning of the “reading” term in Lemense.

A. Overview of Tang/Lemense, Matsui, and Corniot

1. Tang

Tang describes aftermarket replacement sensors/detectors that receive sensor ID/programming signals from a setting tool. As an aftermarket product, called “universal tire pressure monitor” it is capable of supporting many signal/code formats in order to mimic the original OEM detectors that it will replace. The received ID becomes the new ID for the “universal tire pressure monitor.” Tang states that due to the existence of numerous different OEM TPMS systems, “There exists a need for a universal tire monitor for use in remote tire pressure monitoring systems. Such a universal monitor would reduce the need for installers and aftermarket providers to stock multiple tire monitors configured for different TPM systems. Such a universal monitor would also reduce installation complexity since a single monitor and installation procedure could be used” (Ex. 1002, 1:35-43).

The tire pressure detector/monitor is element 16 in Tang FIG. 2 below:

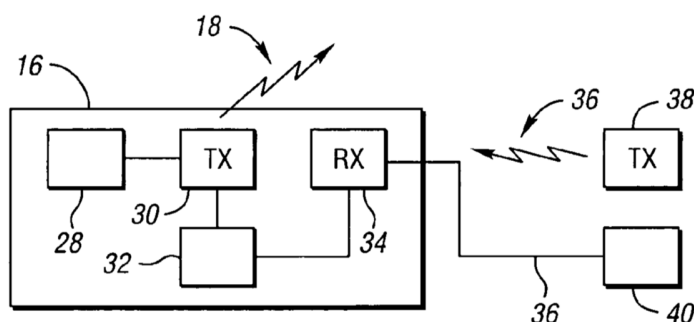


Fig. 2

16: Tire pressure monitor

- 28: Sensor
- 30: Wireless transmitter
- 34: Wireless receiver
- 32: Controller (microprocessor plus memory)
- 36: Code (ID) program signal
- 38: Technician-controlled remote transmitter
- 40: External interface

Tang states in Col. 3, line 66-Col. 5, line 5 (Ex. 1002):

“The universal monitor (16) is for use in a remote tire pressure monitoring system (10)...

A transmitter (TX) (30) is provided in communication with sensor (28) for transmitting wireless signals (18) representative of the sensed tire pressure... In that regard, wireless signals (18) are preferably radio frequency (RF) signals...

A controller (32) is provided in communication with transmitter (30) and with a receiver (34). Controller (32) preferably comprises a microprocessor, which preferably includes a storage device or memory, such as a read-only memory (ROM) and/or any type of random access memory (RAM). According to one embodiment of the present invention, controller (32) is for storing a plurality of manufacturers' codes...

Referring still to FIG. 2, receiver (34) is for receiving a program signal (36)...

[C]ontroller (32) may be used to store a particular manufacturer's code received via program signal (36). In that regard, controller (32) may store a base code, and a program signal (36) sent to receiver (34), such as by a technician via remote transmitter (38) or external interface (40), includes a particular manufacturers' code for storage by controller (32).”

Thus, Tang shows the same aftermarket rewriteable detector/monitor (monitor 16) of the ‘064 patent system claims and shows an external setting tool 38 for wirelessly setting the ID of this programmable tire pressure monitor.

2. Lemense

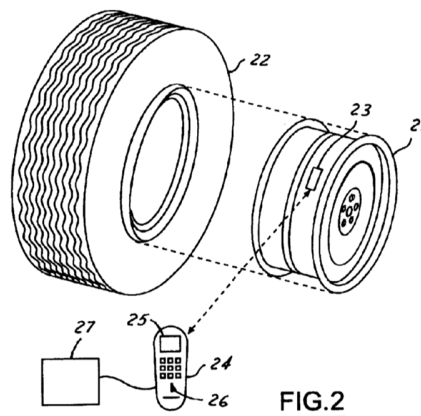
Lemense (Ex. 1004) describes a setting tool for programming an after-market TPMS sensor/monitor with an ID copied from an old tire pressure sensor/detector/monitor (that is, the one that is currently installed in a wheel; the newly-programmed aftermarket monitor will replace the old TPMS monitor). Lemense states (Ex. 1004 3:57-4:4), “Preferably, the service tool is used to replicate or clone the ID code of a broken sensor unit into a replacement sensor unit over a LF communication link between the service tool and the replacement sensor unit... The sensor units may preferably be comprised of a universal replacement sensor of the type described in co-pending U.S. application serial number (Lear attorney docket 4056).”

As seen in Ex-1008, which is a screenshot of the Patent Center Application Data for the Tang patent, the Attorney Docket Number appears as “LEAR 04056

PUS.” Therefore, it is clear that the Tang patent is the “Lear 4056” universal replacement sensor of Lemense. Further, the Declaration of Tang (Ex. 1007), the first-named inventor of Tang and a coinventor of Lemense, makes it clear that the Tang patent is, in fact, “Lear 4056” of Lemense.

As such, it is respectfully submitted that “motivation to combine” comes from the inventors themselves who explicitly state that the detector of Tang and setting tool of Lemense is the “system” corresponding to the system of the ‘064 patent. Therefore, the Tang/Lemense detector/setting tool system is, essentially, the same as a single “reference” that corresponds to the “system” patent for the same detector/setting tool of the ‘064 patent; no external motivation to combine is required.

Lemense shows a sensor/detector/monitor 23 and a service tool 24:



Lemense states, “As shown in FIG. 2, a sensor unit 23 is mounted to a wheel 21 so that it is exposed to the interior of a tire 22 when it is installed on wheel 21. A service tool 24 is utilized in the present invention for interacting with sensor unit 23

using the UHF radio link. It preferably includes a display 25 and a control keypad 26” (Ex. 1004, 2: 63-3:1).

FIG. 3 of Lemense is a schematic of the electronics of service tool 24:

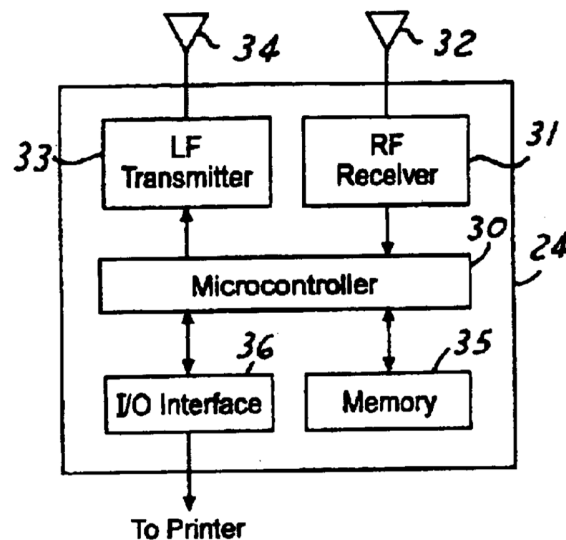


FIG.3

30: microcontroller (“control module”)

33: LF transmitter

31: RF receiver

36: I/O interface

35: memory

34: transmit antenna

32: receive antenna

The receiving module 31 of the setting tool receives an RF signal from the pressure sensor: “A microcontroller 30 is coupled to an RF receiver 31 and to an LF

transmitter 33. RF receiver 31 receives transmissions from a sensor unit via an antenna 32” (Ex. 1004, 3:4-7).

After the old ID has been written into the new, unprogrammed (Tang) sensor, Lemense states, “The replacement sensor unit is swapped with the original (faulted) sensor by mounting the replacement sensor to the corresponding wheel prior to re-installing the tire. If sensor unit damage prevents RF communication, then the corresponding ID code may be determined by other means (e.g., reading from a printed label on the sensor unit or obtaining the stored ID code from the control unit) and may then be programmed into the replacement sensor by the service tool...Consequently, there is no need to reconfigure the correlation of ID codes with wheel locations stored in the control unit since these have not changed even if a sensor unit has been replaced.” (Ex. 1004, 4:60-5:10).

Lemense states it is desirable to test all the tire pressure sensors as a last step by the service technician after programming the universal tire pressure sensor with the ID from the old tire pressure sensor. This testing includes receiving a signal, wirelessly, from the newly-programmed sensor and determining if it is working properly. “It may be desirable to retest each sensor after mounting to ensure that each is still functioning using the same test procedure shown in steps 40 through 43.” (Ex. 1004, 4:10-13).

Steps 40-43 are shown in the Lemense flowchart of FIG. 4. Step 40 is establishing high pressure in the tires, step 41 is to interrogate the sensor using the service tool. Step 42 establishes a low pressure in the tires, followed by re-interrogation of the sensor units in step 43. Lemense describes these steps in detail in col. 3, lines 14-37 (Ex. 1004): “Microcontroller 30 is programmed to perform various functions in order to interrogate a sensor unit that is placed within a close proximity (i.e., within the short range of the LF wake-up signal). An overall method of tire servicing according to the present invention is shown in FIG. 4. In order to establish a known pressure condition for testing a sensor unit, a full (i.e., high) pressure is established in a tire or tires to be serviced in step 40. The sensor unit(s) is (are) interrogated in step 41 using the service tool to send a wake-up command and to receive a data signal and ID code from each sensor unit involved in the tire replacement or repair. By comparing the data signal (i.e., pressure measurement or pressure range indication) with that expected in view of the full pressure present in the tire, the result of each interrogation can be classified by the service tool as a nominal result or a faulted result. A below normal (i.e., low) pressure is established in the tire or tires being serviced in step 42. The sensor unit(s) is (are) re-interrogated in step 41 again using the service tool and the result(s) of the re-interrogation(s) are classified. In step 44, the nominal or faulted results are recorded in memory by the service tool along with the respective ID codes and wheel locations (i.e., left-front,

right-front, left-rear, right-rear). In step 45, either a tire service technician or the service tool itself makes a determination whether all sensor units for all tires being serviced are working properly.”

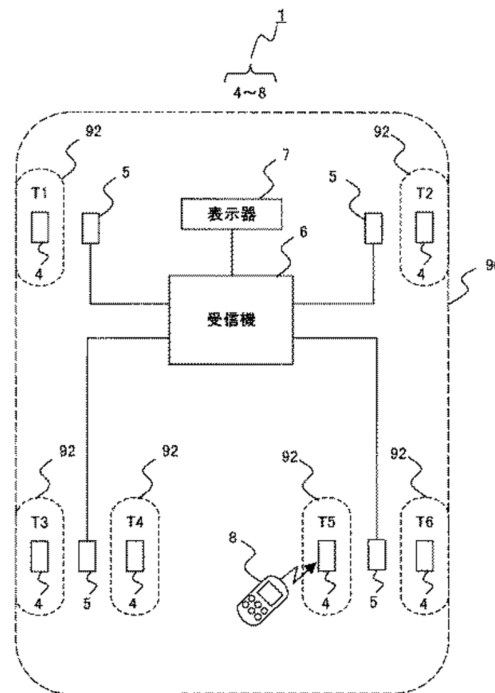
Since the sensor being interrogated transmits its sensor ID and the service tool re-interrogates the sensor, it is deemed that the service tool “judges the consistency” of the IDs.

Thus, the Tang/Lemense aftermarket TPMS detector/setting tool combination shows a tire pressure detector which is programmable with an ID code and a setting tool that copies an ID code from an old detector and programs the new, programmable detector with this old ID code. As will be seen in the detailed explanation below, this is the identical “system” of the ‘064 patent.

3. Matsui

Although it is deemed that the Tang/Lemense system “judges the consistency” of the programmed IDs, Matsui (Ex. 1005) describes in further detail how “judging the consistency” is performed when new IDs are programmed into tire pressure detectors. In Matsui, a setting tool 8 sends a new ID to a detector 4 as seen in Matsui FIG. 1, below. Note that Matsui refers to pressure detector 4 as a “transmitter” since it transmits the tire pressure to the car controller. As set forth above, a number of names have been used to describe the TPMS component in the wheel and these

names all refer to the same TPMS tire pressure monitor/detector/sensor product which all include RF transmitters.



After the ID is sent from setting tool 8 to detector/transmitter 4, the setting tool checks the sensor and if there is no response corresponding to the setting tool transmitted ID, the setting process terminates and a new setting process is initiated. In paragraph [0034], Ex. 1005, Matsui states, “Next, in step 80, the generated transmitter identifier TID is transmitted and set to the transmitter 4 [tire pressure sensor/detector]. Then, in the determination step 82, it is determined whether or not a response has been returned from the transmitter 4. If it does not return, a registration process failure message is displayed in step 88 and the setting process is terminated... Next, in the determination step 84, it is determined whether or not an

instruction to complete registration has been issued by the user. If the registration is not completed, return to step 72 and set another transmitter 4 identifier.”

Thus, the setting tool of Matsui checks the ID (“judges the consistency”) and, if it is not correct, the transmitter/pressure sensor 4 is reprogrammed by the setting tool 8.

4. Corniot

Corniot (Ex. 1006) shows a pressure sensor 16 in Corniot FIG. 4 below with elements 7, 8, or 9, described as a label or an electronic label. The label 7, 8, or 9 is read by a maintenance tool performing automatic tire maintenance on a tire.

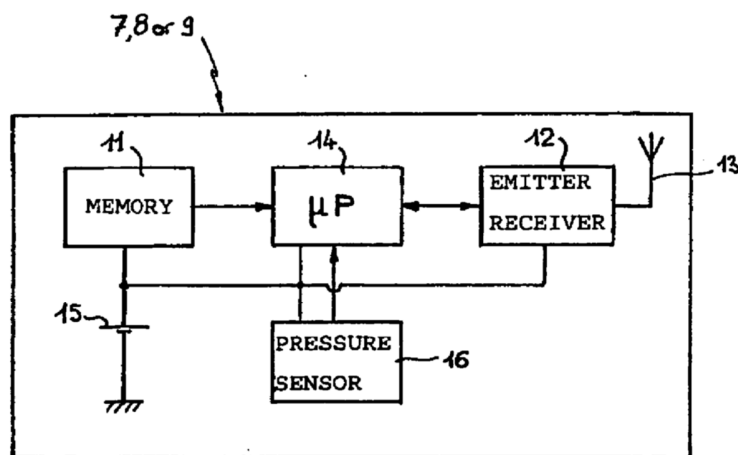


FIG. 4

In one embodiment, maintenance tool 1' includes a bar code reader (optical code reader 19') for reading 7, 8, or 9, which may be a bar code, as seen in Corniot FIGS. 5 and 6, below:

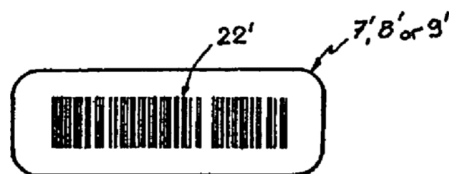
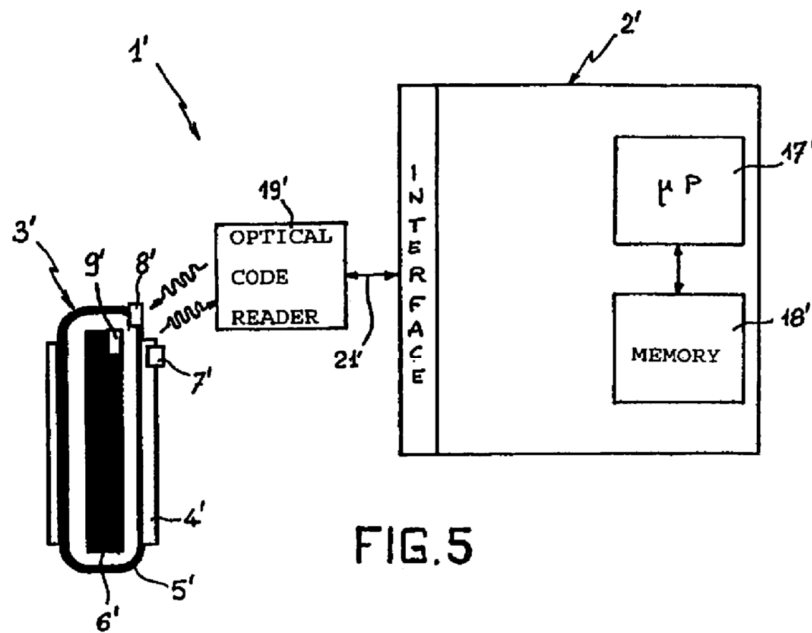


FIG. 6

Corniot states the optical reader can be placed in the immediate vicinity of a label for reading (Ex. 1005, paragraph [109]).

5. Reasons/Motivation to Combine

As discussed above, Tang/Lemense is, essentially, a single system reference with the Lemense setting tool being used to program the monitor of Tang as stated explicitly by Lemense and as set forth in the Declaration of Dr. Tang (Ex.1007).

In his declaration, Dr. Tang states:

“The Tang and Lemense patents describe an aftermarket TPMS system in which the Tang sensors are universal programmable sensors that “clone” an OEM sensor. They are used when an OEM sensor needs to be replaced and are programmed such that they mimic the original OEM system and can therefore act as the original OEM sensor when replacing the OEM sensor. Lemense is a setting tool/service tool that uses the Tang sensors. The Lemense tool wirelessly copies the ID code from the old OEM sensor to be replaced and writes it into a Tang sensor. This programmed sensor then is used as a “clone” sensor in the existing TPMS system of a vehicle...”

Column 4, lines 1-4 of Lemense states: “The sensor units may preferably be comprised of a universal replacement sensor of the type described in co-pending U.S. application serial number (Lear attorney docket 4056).” The Tang patent is the “Lear attorney docket 4056” cited in Lemense. These two patents were designed to be used together as evidenced by this statement in Lemense. Therefore, I consider the inventions in the Tang and Lemense patents as one “system” of sensor plus setting tool.”

Matsui is used to show that, when the detector/sensor does not return the programmed code, the technician will reprogram the sensor. While this feature is not explicitly stated in Lemense, it is clearly implied by the “check to see if working properly” statement in Lemense. The POSA, upon reading Lemense and Matsui, would be motivated to resend a code if the sensor is not transmitting properly, since

Lemense requires sensor checking. Thus, a tire repair technician would, upon encountering the non-working sensor in Lemense, repeat the programming process with the old sensor ID until the sensor is working properly. Further, it is noted that this reprogramming is, in all references, including the target '064 patent, a step performed by the technician operating the setting tool and is not a feature of the tool. In general, checking that parts are working properly and repeating a repair until the part is working properly is something that is obviously performed by any repair shop technician repairing any part. With wireless systems, checking wireless code transmissions is a standard technical check, even by a layman checking a new password in a wireless router, for example.

The POSA would be motivated to combine the code scanner of Corniot with the setting tool of Lemense since Lemense teaches reading the code from the sensor, although Lemense does not state how the code is read. The code reader of Corniot is a type of optical code scanner that would have been obviously used in view of the disclosure that the code should be “read” from the sensor. Code readers are more accurate than visual reading by human eyes followed by manual entry using a keypad.

B. Application of the References to the Claims

The '064 patent includes both system and method claims. As the method claims generally repeat elements of the system claims, various elements have been

numbered below. When an identical element appears in another system claim or in a method claims, that numbered element is cited for the detailed description of where that element is found in the Lemense/Tang system.

1. SYSTEM CLAIMS

16. A tire pressure detecting system comprising:

an identification rewriteable tire pressure detector comprising a micro-processing module having a rewriteable memory unit to record an identification; (ELEMENT 1)

The Tang universal pressure monitor 16 is for receiving an ID code from a setting tool, as discussed above. The “micro-processing module having a rewriteable memory” is controller 32.

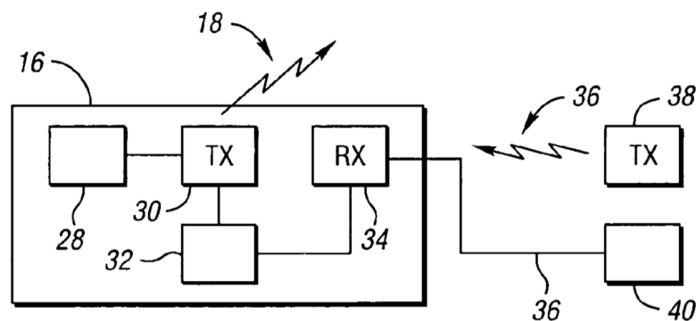


Fig. 2

Tang states:

“A controller (32) is provided in communication with transmitter (30) and with a receiver (34). Controller (32) preferably comprises a

microprocessor, which preferably includes a storage device or memory, such as a read-only memory (ROM) and/or any type of random access memory (RAM). According to one embodiment of the present invention, controller (32) is for storing a plurality of manufacturers' codes..." (Ex. 1002, 2:21-25).

RAM is rewriteable memory, as known in the art. Since the Tang sensors are designed to receive an ID code, they are rewriteable sensors. Dr. Tang states in his Declaration (Ex. 1007) that the sensor memory of the Tang patent is rewriteable:

"The Tang universal tire pressure monitor has a microprocessor controller that includes memory which is rewriteable. We designed the memory to be rewriteable so that an ID can be programmed into the memory using the Lemense setting tool."

a sensing module electrically connected to the micro-processing module and having a pressure-detecting unit to detect a tire pressure and send a detection result to the micro-processing module; (ELEMENT 2)

Tang describes a pressure sensor 28 that connects to the transmitter/controller assembly in order to send out the pressure signal. Tang states,

"A transmitter (TX) (30) is provided in communication with sensor (28) for transmitting wireless signals (18) representative of the sensed tire pressure... In that regard, wireless signals (18) are preferably radio frequency (RF) signals... A controller (32) is provided in communication with transmitter (30) and with a receiver (34).

Controller (32) preferably comprises a microprocessor...” (Ex. 1002, 4:10-23).

Note that the sensing module sends signals to the microprocessor 32 when it sends the signals to the transmitter since the transmitter/controller is a single electronic unit as stated in the Tang Declaration (Ex. 1007). Dr. Tang states in his Declaration:

“The transmitter 30 and microcontroller 32 are a single integrated unit. When the [Tang] patent says that the pressure sensor 28 sends the signal to the transmitter, it sends this signal to the single integrated unit of 30/32 which is the same feature of the Yu patent claims.” (Ex. 1007).

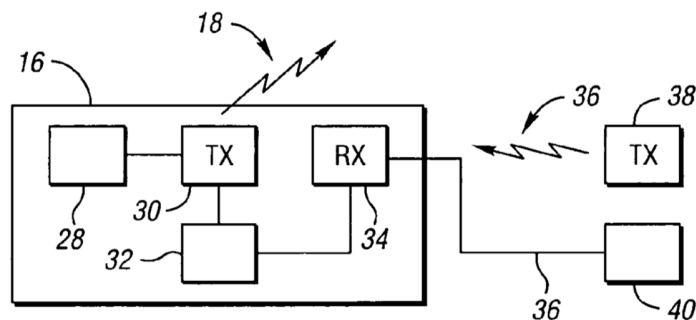


Fig. 2

a transmitting module controlled by the micro-processing module to transmit a radio frequency (RF) signal, wherein the RF signal comprises the detection result and the identification of the identification rewriteable tire pressure detector; (ELEMENT 3)

As discussed above, the Tang microprocessor 32 controls the transmitter 30 and the transmitter transmits the sensor ID code along with the pressure reading. This is required because a receiver (Tang, element 24) in the car receiving the tire pressure signal needs to know which tire is transmitting that pressure so that the controller in the car can determine if there is a tire pressure fault (see Tang FIG. 1, below). Tang states:

“Subsequently, during operation of the TPM system, controller (32) controls transmitter (30) to transmit wireless signal (18) according to the signal format indicated by the selected manufacturers' code. As previously described, signal formats for wireless signal (18) may include characteristics such as carrier frequency, modulation scheme, data format, encryption technique and/or other characteristics. In that regard, with reference again to FIG. 1, receiver (24) for on-board controller (20) is configured to receive wireless signals (18) having the signal format of the selected one of the plurality of manufacturers' codes. Controller (26) of control module (20) then conveys at least tire pressure information to a vehicle occupant via display (22)” (Ex. 1002, 4:53-65).

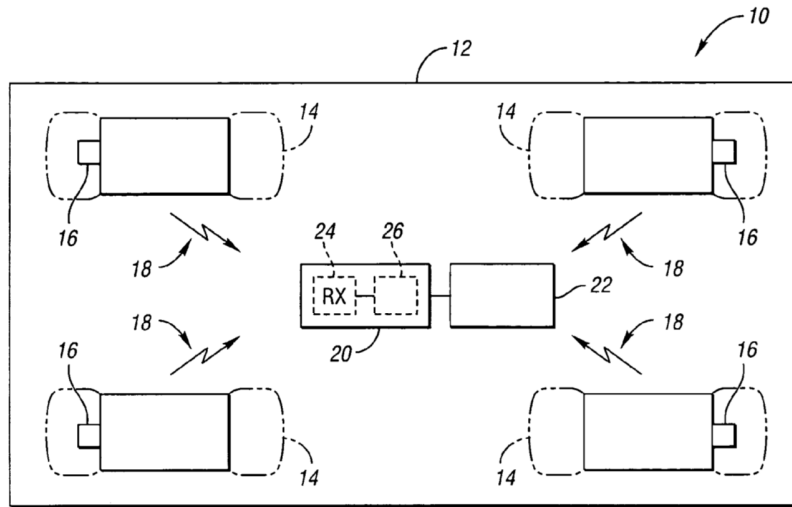


Fig. 1

a power module electronically connected to the micro-processing module to supply power to the identification rewriteable tire pressure detector; and
(ELEMENT 4)

Tang states the that the power module of the tire pressure monitor is a battery which is not shown. The location of the battery as being connected to the microprocessing module is a standard battery location in portable electronic devices and would have been inherently or obviously used in Tang.

“As is well known in the art, tire monitor (16) also includes a battery (not shown) in communication with and for providing power to transmitter (30)” (6:5-7).

an interface arranged to receive an external signal and send the external signal to the microprocessing module, wherein the external signal comprises an external identification to be written into the rewriteable memory unit or to be used to overwrite a preset identification in the rewriteable memory unit; and
(ELEMENT 5)

In the Tang tire pressure monitor, the “interface” is receiver 34 which receives the ID (which Tang calls a program signal) and sends it to the controller 32. As described above, controller 32 includes memory and the ID/program signal is therefore written into the memory. Tang states,

“Referring still to FIG. 2, receiver (34) is for receiving a program signal (36). Program signal (36) is preferably a low frequency (LF) signal, such as in the range of approximately 125-135 kHz, transmitted from a remote LF transmitter (38). Receiver (34), program signal (36) and remote transmitter (38), however, could take other forms known in the art, such as RF” (Ex. 1002, 4:33-43).

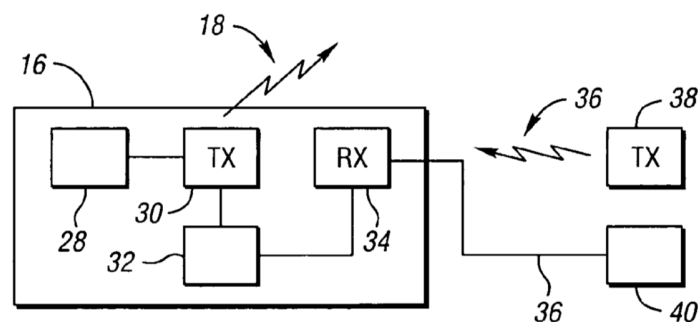


Fig. 2

Dr. Tang, in his Declaration, further explains this “program signal” (Ex. 1007):

“Our “program signal” that is written into the universal monitor memory includes the “external identification” of the Yu patent. This is because the monitor is designed to “clone” the OEM sensor that it being replaced. In the TPMS system in the vehicle, the sensor ID (“manufacturer code” is required for the vehicle to identify which tire is sending which pressure number. Without a sensor ID, the TPMS system cannot display the tire pressure for each tire.”

Therefore, as set forth above, Tang describes a programmable aftermarket tire pressure monitor that is identical to that set forth in the ‘064 patent. The monitor of Tang is designed to the same purpose as that of the ‘064 patent, that is, it is programmable so that a code may be received that is compatible with the particular car model into which it is to be installed. In that way, it “mimics” the OEM sensor of the car manufacturer.

The next portion of the ‘064 system claim 16 (and all independent claims) is the setting tool for writing the ID into the aftermarket tire pressure monitor/detector. Tang shows a setting tool 38, described as a “technician-controlled remote transmitter” in Tang FIG. 2, reproduced above. However, this setting tool is not described in detail because it is the subject of the companion Lemense patent. This is because, while the ‘064 patent claims a system of the detector and the setting tool, the Lear/Schrader patents choose, instead, to describe and claim each of these

devices separately while stating that the Tang sensors are to be used with the Lemense setting tool.

Therefore, the description of the setting tool of Lemense is detailed below.

a portable setting apparatus arranged to communicate with the identification rewriteable tire pressure detector, comprising: (ELEMENT 6)

Lemense describes a setting tool as service tool 24 for interacting with sensor unit 23 as shown in FIG. 2 below. Again the inconsistent terminology for tire pressure monitors/detectors/sensors is noted but all relate to the same device that measures tire pressure and transmits this information to a car receiver.

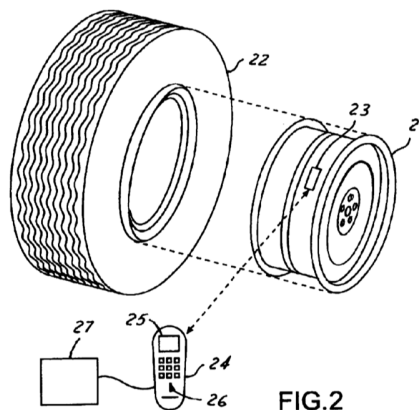


FIG.2

Lemense states,

“As shown in FIG. 2, a sensor unit 23 is mounted to a wheel 21 so that it is exposed to the interior of a tire 22 when it is installed on wheel 21. A service tool 24 is utilized in the present invention for interacting with sensor unit 23 using the UHF radio link. It preferably includes a display 25 and a control keypad 26” (2: 63-3:1).

Note that the “service tool 24” of Lemense corresponds to the “remote LF transmitter 38” in Tang used to program the Tang sensors. The inconsistent terminology between these two patents is due to the fact that they were sent to different law firms for patent drafting. Dr. Tang states in his Declaration (Ex. 1007):

“Turning to the setting tool/service tool portion of our Tang/Lemense aftermarket TPMS replacement system, the Lemense patent is where we described, in detail, how to “clone” an OEM sensor so that our universal sensor becomes the “drop-in” replacement sensor for a broken sensor in an existing vehicle TPMS system. The handheld wireless service tool 24 of Lemense FIG. 2 ... corresponds to the “remote LF transmitter 38” in the Tang patent that sends a program signal with the ID code to program the Tang universal TPMS monitor 23 in the wheel.”

a control module; (ELEMENT 7)

The Lemense service tool includes microcontroller 30:

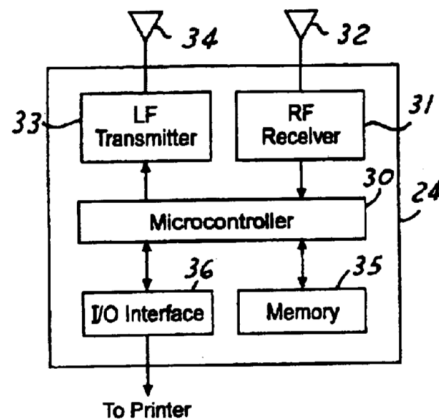


FIG.3

an input module connected to the control module to enable an operator to manually input an identification to be written into the identification rewriteable tire pressure detector; (ELEMENT 8)

The service tool can receive manual ID input by an operator, particularly when the sensor is damaged so that it cannot transmit its ID to the setting tool. Lemense states:

“If sensor unit damage prevents RF communication, then the corresponding ID code may be determined by other means (e.g., reading from a printed label on the sensor unit or obtaining the stored ID code from the control unit) and may then be programmed into the replacement sensor by the service tool.” (3:63-4:1)

a receiving module connected to the control module to receive the RF signal from the identification rewriteable tire pressure detector or a tire pressure detector and to send the RF signal to the control module; (ELEMENT 9)

The Lemense setting tool can receive the ID from the old pressure sensor/detector currently installed on the car tire that is to be replaced- that is, the old ID that it will write into the Tang tire pressure monitor/sensor/detector so that the universal aftermarket device is a clone of the OEM device. As seen in Lemense FIG. 3 above, the RF receiver 31 is connected to the microcontroller which has memory 35 where this ID will be stored.

Lemense states:

“RF receiver 31 receives transmissions from a sensor unit via an antenna 32” (3:4-7).

a setting output module controlled by the control module to send the external signal to the interface of the identification rewritable tire pressure detector, wherein the external signal is generated by the control module and comprises the identification that is provided by the input module or provided by the RF signal received from the receiving module; and (ELEMENT 10)

The transmitter 33 of Lemense sends an external signal (from the old tire pressure detector whose signal is read and stored into memory) to write an ID (the old tire pressure detector ID) into the universal tire pressure sensor of Tang.

Lemense calls this “cloning” the old sensor so that the new sensor can function as a replacement sensor for the old sensor. Lemense states:

“Preferably, the service tool is used to replicate or clone the ID code of a broken sensor unit into a replacement sensor unit over a LF communication link between the service tool and the replacement sensor unit... The sensor units may preferably be comprised of a universal replacement sensor of the type described in co-pending U.S. application serial number (Lear attorney docket 4056)” (Ex. 1004, 3:57-4:4). Note that Lear 4056 is the Tang patent, as discussed above.

Dr. Tang explains this cloning is his Declaration (Ex. 1007) stating:

“When we say to “clone the ID” this corresponds to the program signal 36 in Tang that was sent by remote LF transmitter 38. Note that “ID” is a rather broad term that encompasses both the particular sensor ID and the manufacturer ID code/format, as described above (which are transmitted together as a single string of information).”

a power source connected to the control module to supply power to the setting apparatus; (ELEMENT 11)

No power supply is shown in the Lemense service tool. Since it is a handheld, portable service tool, such a power supply would inherently be a part of the service tool.

wherein the setting apparatus is configured to:

obtain an update identification to be written into a new identification rewriteable tire pressure detector either by (1) receiving the RF signal from an old tire pressure detector by the receiving module, retrieving an old identification of the old tire pressure detector from the RF signal, and using the old identification as the update identification, or by (2) receiving a manual input of the identification from the input module, and using the identification as the update identification; (ELEMENT 12)

The transmitter 33 of the Lemense service tool writes a new ID into the universal tire pressure detector of Tang. This new ID is obtained by wirelessly or manually reading on old ID from an old tire pressure sensor to be replaced (for example, the OEM sensor of the original car manufacturer).

Lemense states:

“Preferably, the service tool is used to replicate or clone the ID code of a broken sensor unit into a replacement sensor unit over a LF communication link between the service tool and the replacement sensor unit... The sensor units may preferably be comprised of a universal replacement sensor of the type described in co-pending U.S. application serial number (Lear attorney docket 4056)” (Ex. 1004, 3:57-4:4).

The Tang Declaration (Ex. 1007) further explains the cloning of codes and relates the use of the term “ID code” in Lemense to the “manufacturers’ codes” of the Tang patent. Dr. Tang states:

“We designed this tire pressure monitor to be programmed with the ID from an existing sensor...Note that the Tang patent uses the term “manufacturers’ codes” while the Lemense patent uses the term “ID code.” Both terms relate to the identical sensor identification code (which includes both the specific sensor number as well as other numbers relating to signal formats and parity checks used by individual manufacturers); as the two patents were written by two different patent attorneys at two different law firms there are some minor discrepancies between the terminology of the two patents.

store the update identification in the setting apparatus;

generate the external signal comprising the update identification as the external identification, and send the external signal to the new identification rewriteable tire pressure detector such that the new identification rewriteable pressure detector records the update identification in the rewriteable memory unit or overwrites the present identification in the rewriteable memory unit by the update identification; and (ELEMENT 13)

In Lemense, the old ID from the old sensor is received via antenna 32 into receiver 32 where it is sent to microcontroller 30 with memory 35. It is then sent to

the new universal monitor of Tang to be its new ID where it is stored in the memory of microcontroller 32 in Tang FIG. 2. See the quotation from Lemense for element 12, above. In Tang, the remote transmitter 38 (that corresponds to Lemense service tool 24) sends the program signal. Tang states:

“Alternatively, rather than storing a plurality of manufacturers’ codes, controller (32) may be used to store a particular manufacturer’s code received by program signal (36) [which is sent by remote transmitter 38]” (Ex. 1002, 4:67-5:1).

verify the update identification newly recorded in the rewriteable memory unit of the new identification rewriteable tire pressure detector, wherein the verifying step comprises:

receiving, by the setting apparatus, a wireless signal from the new identification rewriteable tire pressure detector, wherein the wireless signal comprises the update identification newly recorded in the rewriteable memory unit; and

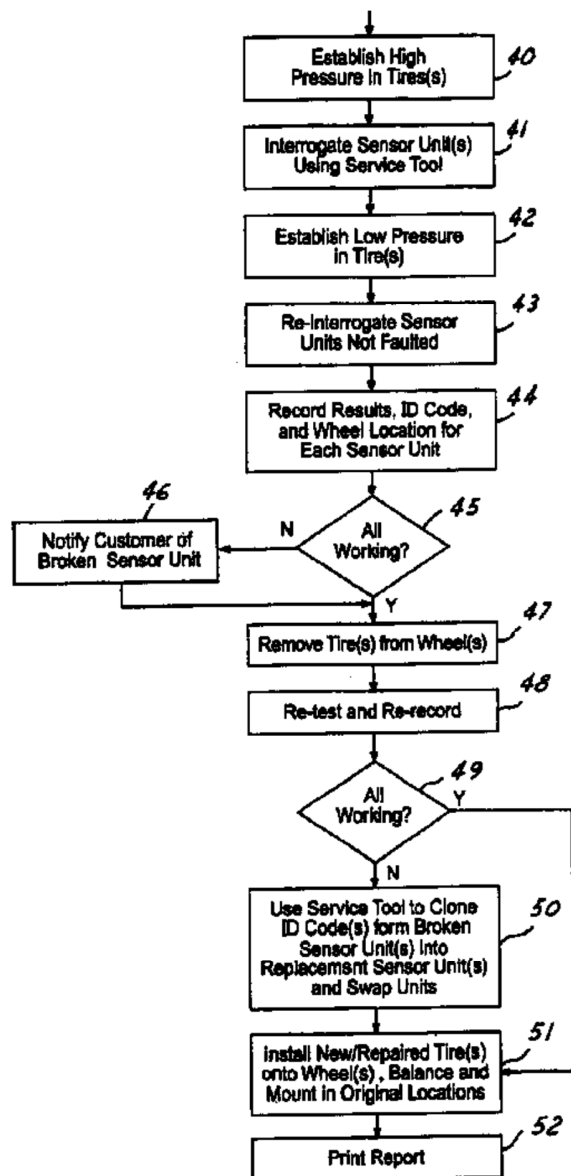
judging, by the setting apparatus, consistency of the update identification newly recorded in the rewritable memory unit and the old identification of the old tire pressure detector. (ELEMENT 14)

Lemense states it is desirable to test all the tire pressure sensors with the service tool 24 as a last step by the service technician after programming the

universal tire pressure sensor with the ID from the old tire pressure sensor using the service tool 24. This testing includes receiving a signal, wirelessly, from the newly-programmed sensor and determining if it is working properly.

Lemense states: “It may be desirable to retest each sensor after mounting to ensure that each is still functioning using the same test procedure shown in steps 40 through 43” (Ex. 1004, 4:10-13).

Steps 40-43 are shown in the Lemense flowchart of FIG. 4 which shows a comprehensive sensor testing (to ensure proper sensor functioning), replacement (for non-working sensors), and retesting protocol (for new sensors that have been cloned using IDs from old sensors) for a tire service technician using the service tool 24.



Step 40 is establishing high pressure in the tires, step 41 is to interrogate the sensor using the service tool. Step 42 establishes a low pressure in the tires, followed by re-interrogation of the sensor units in step 43.

Lemense describes these steps in detail in col. 3, lines 14-37 (Ex. 1004):

“Microcontroller 30 [of service tool 24] is programmed to perform various functions in order to interrogate a sensor unit that is placed within a close proximity (i.e., within the short range of the LF wake-up signal). An overall method of tire servicing according to the present invention is shown in FIG. 4. In order to establish a known pressure condition for testing a sensor unit, a full (i.e., high) pressure is established in a tire or tires to be serviced in step 40. The sensor unit(s) is (are) interrogated in step 41 using the service tool to send a wake-up command and to receive a data signal and ID code from each sensor unit involved in the tire replacement or repair. By comparing the data signal (i.e., pressure measurement or pressure range indication) with that expected in view of the full pressure present in the tire, the result of each interrogation can be classified by the service tool as a nominal result or a faulted result. A below normal (i.e., low) pressure is established in the tire or tires being serviced in step 42. The sensor unit(s) is (are) re-interrogated in step 41 again using the service tool and the result(s) of the re-interrogation(s) are classified. In step 44, the nominal or faulted results are recorded in memory by the service tool along with the respective ID codes and wheel locations (i.e., left-front, right-front, left-rear, right-rear). In step 45, either a tire service technician or the service tool itself makes a determination whether all sensor units for all tires being serviced are working properly.”

Since the sensor being interrogated transmits its sensor ID and the service tool re-interrogates the sensor, it is deemed that the service tool of Lemense “judges

the consistency” of the IDs since the service tool itself sent the ID that was programmed into the sensor.

Dr. Tang, in his Declaration (Ex. 1007) also explains what the service technician does during sensor programming and checking of the programmed code:

“As we stated in Lemense, the newly-programmed sensor is interrogated by the service tool and then the newly-programmed sensor responds with its information (sending its pressure signals as well as its ID since all transmissions include the sensor ID as well as the measured conditions). During this transmission by the newly programmed sensor, the service tool of Lemense sees the ID and whether it is the same as the code that was programmed into the sensor. In general, the service technician determines to reprogram the sensor if the code is incorrect after this interrogation following programming. This is because the service technician will also check the vehicle TPMS controller to ensure that the newly-programmed sensor is being read by the vehicle controller. Since the vehicle controller is not reprogrammed, it will only recognize the old ID from the old sensor. Therefore, every tire repair technician will, as a matter of shop protocol, ensure that the entire system is working before returning the vehicle to the customer.”

In the alternative, the JP patent publication to Matsui teaches that, when a new ID (TID) is programmed into a tire pressure monitor by a setting tool, the setting tool checks the sensor and if there is not a response based on that ID, the setting

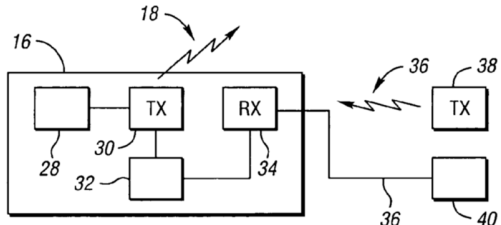
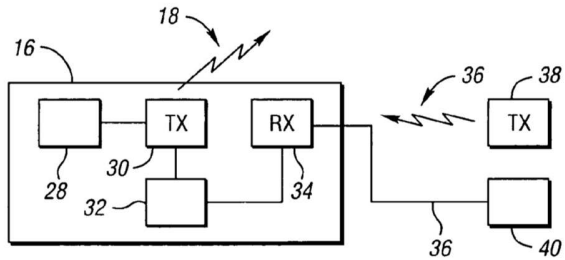
process terminates and a new setting process is initiated. In paragraph [0034], Ex. 1005, Matsui states:

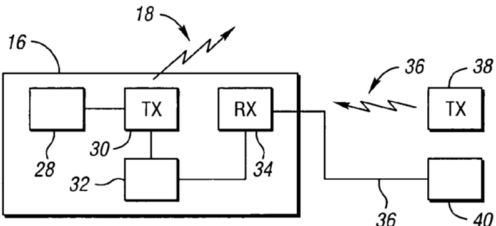
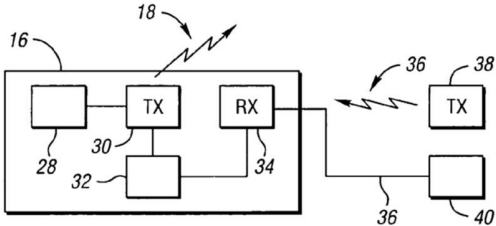
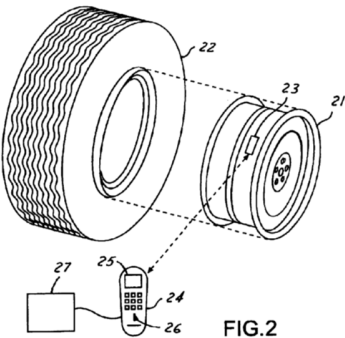
“Next, in step 80, the generated transmitter identifier TID is transmitted and set to the transmitter 4. Then, in the determination step 82, it is determined whether or not a response has been returned from the transmitter 4. If it does not return, a registration process failure message is displayed in step 88 and the setting process is terminated... Next, in the determination step 84, it is determined whether or not an instruction to complete registration has been issued by the user. If the registration is not completed, return to step 72 and set another transmitter 4 identifier. In step 84, when registration is completed, in step 86, the TID previously set by the process of steps 72 to 84 is transmitted to the receiver 6 in relation to the tire position.”

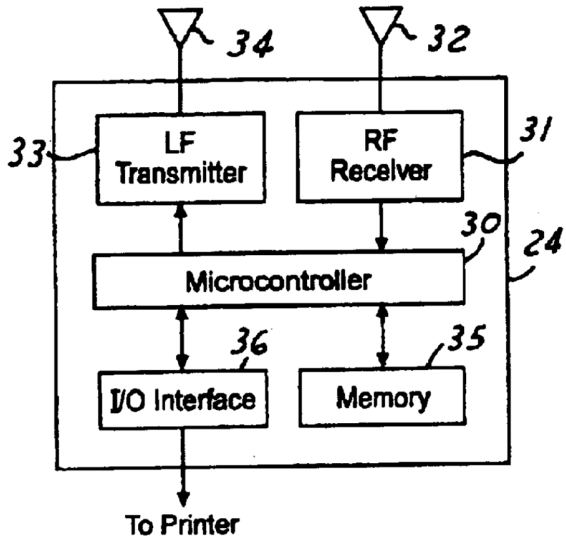
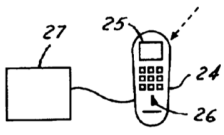
It would have been obvious to use the setting process of Matsui in the system of Tang/Lemense since checking to see that the ID has been correctly programmed is an important final step to ensure correct operation of the overall system, otherwise, the controller in the automobile will not be able to recognize the new sensor (since it will not receive the correct ID from the new sensor). As stated above, a POSA or even laymen will naturally check to see that an ID set by wireless means has been correctly received; for example, checking a new WiFi password that you have programmed into your router to see if the new password that you set has been properly received by the router.

Therefore, claim 16 is considered obvious in view of the Tang/Lemense system, optionally in view of Matsui.

For reference, a partial claim chart for claim 16 is shown below for the physical claim elements prior to the “wherein” clause:

ORANGE ‘064 C3 Patent (Ex. 1001) Claim 16 (partial)	TANG (Ex. 1002) LEMENSE (Ex. 1004)
16. A tire pressure detecting system comprising: an identification rewriteable tire pressure detector comprising a micro-processing module having a rewriteable memory unit to record an identification;	Tang tire monitor 16 having rewriteable memory 32  <i>Fig. 2</i>
a sensing module electrically connected to the micro-processing module and having a pressure-detecting unit to detect a tire pressure and send a detection result to the micro-processing module;	Tang pressure sensor 28 connects to transmitter/controller assembly 30 transmitting pressure signal 18.  <i>Fig. 2</i>
a transmitting module controlled by the micro-processing module to transmit a radio frequency (RF) signal, wherein the RF signal	Tang microprocessor 32 controls the transmitter 30 transmitting signal 18

comprises the detection result and the identification of the identification rewriteable tire pressure detector;	 <i>Fig. 2</i>
a power module electronically connected to the micro-processing module to supply power to the identification rewriteable tire pressure detector; and	Tang states monitor 16 includes a battery (not shown)
an interface arranged to receive an external signal and send the external signal to the microprocessing module, wherein the external signal comprises an external identification to be written into the rewriteable memory unit or to be used to overwrite a preset identification in the rewriteable memory unit; and	Receiver 34 receives the ID in signal 36 and sends to controller 32 having rewriteable memory  <i>Fig. 2</i>
a portable setting apparatus arranged to communicate with the identification rewriteable tire pressure detector, comprising:	Lemense service tool 24:  FIG.2

a control module;	Lemense service tool 24 includes microcontroller 30:  FIG.3
an input module connected to the control module to enable an operator to manually input an identification to be written into the identification rewriteable tire pressure detector;	Lemense: keypad 26 or optical code scanner (inherent in Lemense teaching to “read” from barcode)  FIG.2
a receiving module connected to the control module to receive the RF signal from the identification rewriteable tire pressure detector or a tire pressure detector and to send the RF signal to the control module;	Lemense: RF receiver 31 connected to the microcontroller which has memory 35 where ID will be stored
a setting output module controlled by the control module to send the external	Lemense: “... the service tool is used to replicate or clone the ID code of a broken sensor unit into a replacement sensor unit

signal to the interface of the identification rewritable tire pressure detector, wherein the external signal is generated by the control module and comprises the identification that is provided by the input module or provided by the RF signal received from the receiving module; and	over a LF communication link between the service tool and the replacement sensor unit... The sensor units may preferably be comprised of a universal replacement sensor of the type described in co-pending U.S. application serial number (Lear attorney docket 4056)”
a power source connected to the control module to supply power to the setting apparatus;	Inherent for power tools, not shown.

17. The tire pressure detecting apparatus as claimed in claim 16, wherein the input module comprises a code scanner.

Lemense states that the ID code can be “read” from a printed label. The printed labels of tire pressure sensors are typically bar codes. Lemense col. 3, line 63- col. 4, line 1 (Ex. 1004) states: “If sensor unit damage prevents RF communication, then the corresponding ID code may be determined by other means (e.g., reading from a printed label on the sensor unit or obtaining the stored ID code from the control unit) and may then be programmed into the replacement sensor by the service tool.”

The “reading from a printed label” is deemed to include a bar code scanner as well as human reading/input of numbers using the keypad or it would have been

obvious to use a scanner in view of the teaching of “reading from a printed label” of Lemense.

The reference to Corniot (Ex. 1006) shows a tool (“maintenance device 1”) with a bar code scanner (optical code reader 19’, FIG. 5) that reads a bar code (FIG. 6) in a tire repair shop. To use the bar code scanner of Corniot to perform the “reading from a printed label” of Lemense would have been obvious in order to obtain accurate ID reading from the old tire pressure sensor without the need to key in information on a keypad that could result in mistaken numeral entries.

18. A tire pressure detecting system, comprising:

an identification rewriteable tire pressure detector comprising: a micro-processing module having a rewriteable memory unit to record an identification; (ELEMENT 1)

a sensing module electrically connected to the micro-processing module and having a pressure-detecting unit to detect a tire pressure and send a detection result to the micro-processing module; (ELEMENT 2)

a transmitting module controlled by the micro-processing module to transmit a radio frequency (RF) signal, wherein the RF signal comprises the detection result and the identification of the identification rewriteable tire pressure detector; (ELEMENT 3)

a power module electronically connected to the micro-processing module to supply power to the identification rewriteable tire pressure detector; and
(ELEMENT 4)

an interface arranged to receive an external signal and send the external signal to the microprocessing module, whereing the external signal comprises an external identification to be written into the rewriteable memory unit or to be used to overwrite a present identification in the rewriteable memory unit; and (ELEMENT 5)

a portable setting apparatus arranged to communicate with the identification rewriteable tire pressure detector, comprising: (ELEMENT 6)

a control module; (ELEMENT 7)

an input module connected to the control module to enable an operator to manually input an identification to be written into the identification rewriteable tire pressure detector; (ELEMENT 8)

a receiving module connected to the control module to receive the RF signal from the identification rewriteable tire pressure detector or a tire pressure detector and to send the RF signal to the control module; (ELEMENT 9)

a setting output module controlled by the control module to send the external signal to the interface of the identification rewritable tire pressure

detector, wherein the external signal is generated by the control module and comprises the identification that is provided by the input module or provided by the RF signal received from the receiving module; and (ELEMENT 10)

a power source connected to the control module to supply power to the setting apparatus; (ELEMENT 11)

Elements 1-11 of claim 18 are identical to elements 1-11 of claim 16; please see the above discussion.

wherein the setting apparatus is configured to:

obtain an update identification to be written into a new identification rewriteable tire pressure detector, wherein the update identification is either (1) an old identification of an old tire pressure detector, obtained by receiving the RF signal from the old tire pressure detector by the receiving module and retrieving the old identification from the RF signal, or (2) the identification manually inputted and retrieved from the input module; and (ELEMENT 12')

Element 12' is nearly identical to element 12 of claim 16 with minor word order changes; please see the discussion for element 12'.

generate the external signal comprising the update identification as the external identification, and send the external signal to the new identification rewriteable tire pressure detector; and (ELEMENT 13')

Element 13' is part of element 13 above, please see discussion for element 13.

verify the update identification newly recorded in the rewriteable memory unit of the new identification rewriteable tire pressure detector;

when the rewriteable memory unit has the preset identification stored therein, overwrite the preset identification in the rewriteable memory unit by the update identification; and

when the rewriteable memory unit does not have the preset identification stored therein, record the update identification in the rewriteable memory unit and send the update identification newly recorded in the rewriteable memory unit back to the setting apparatus; (ELEMENT 13’')

Element 13’’ relates to either overwriting an ID or writing a new ID. While Tang describes writing a new ID, the Tang sensor, coupled with the Lemense setting tool, is inherently capable of being overwritten if there is an existing ID stored in the memory, since the Tang memory is inherently rewriteable. Whether a preset ID is overwritten or a new ID is set depends on the repair circumstance that a service technician determines during the tire repair.

wherein the verifying step by the setting apparatus comprises:

receiving, by the setting apparatus, a wireless signal from the new identification rewriteable tire pressure detector, wherein the wireless signal comprises the update identification newly recorded in the rewriteable memory unit; and

judging, by the setting apparatus, consistency of the update identification newly recorded in the rewritable memory unit and the old identification of the old tire pressure detector. (ELEMENT 14')

Element 14' of claim 18 is nearly identical to element 14 of claim 16, please see discussion above.

19. The tire pressure detecting apparatus as claimed in claim 18, wherein the input module comprises a code scanner.

This dependent claim is identical to claim 17, please see discussion of claim 17.

**26. A tire pressure detecting system, comprising:
an identification rewriteable tire pressure detector use for being installed in a vehicle, the identification rewriteable tire pressure detector comprising:
a micro-processing module having a rewriteable memory unit to record an identification; (ELEMENT 1')**

Element 1' is nearly identical to element 1 of claim 16; please see claim 16.

a sensing module electrically connected to the micro-processing module and having a pressure-detecting unit to detect a tire pressure and send a detection result to the micro-processing module; (ELEMENT 2)

a transmitting module controlled by the micro-processing module to transmit a radio frequency (RF) signal, wherein the RF signal comprises the

detection result and the identification of the identification rewriteable tire pressure detector; (ELEMENT 3)

a power module electronically connected to the micro-processing module to supply power to the identification rewriteable tire pressure detector; and (ELEMENT 4)

an interface arranged to receive an external signal and send the external signal to the microprocessing module, whereing the external signal comprises an external identification to be written into the rewriteable memory unit or to be used to overwrite a preset identification in the rewriteable memory unit; and

a portable setting apparatus arranged to communicate with the identification rewriteable tire pressure detector, comprising: (ELEMENT 6)

a control module; (ELEMENT 7)

an input module connected to the control module to enable an operator to manually input an identification to be written into the identification rewriteable tire pressure detector; (ELEMENT 8)

a receiving module connected to the control module to receive the RF signal from the identification rewriteable tire pressure detector or a tire pressure detector and to send the RF signal to the control module; (ELEMENT 9)

a setting output module controlled by the control module to send the external signal to the interface of the identification rewritable tire pressure detector, wherein the external signal is generated by the control module and comprises the identification that is provided by the input module or provided by the RF signal received from the receiving module; and (ELEMENT 10)

a power source connected to the control module to supply power to the setting apparatus; (ELEMENT 11)

Elements 2-11 are identical to elements 2-11 of claim 16, please see the discussion for claim 16.

wherein the portable setting apparatus is not equipped in the vehicle and is portable relative to the vehicle and is configured to: (ELEMENT 11')

The Lemense service tool is a portable service tool used by a technician.

obtain an update identification to be written into a new identification rewriteable tire pressure detector either by (1) receiving the RF signal from an old tire pressure detector by the receiving module, retrieving an old identification of the old tire pressure detector from the RF signal, and using the old identification as the update identification, or by (2) receiving a manual input of the identification from the input module, and using the identification as the update identification; (ELEMENT 12)

Identical to element 12 of claim 16.

wherein the old tire pressure detector stores only the old information;
(ELEMENT 12'')

Typically, an OEM tire pressure sensor (that is “the old tire pressure detector”) has only the ID programmed into it as part of the factory installation.

store the update identification in the setting apparatus;
generate the external signal comprising the update identification as the external identification, and send the external signal to the new identification rewriteable tire pressure detector such that the new identification rewriteable pressure detector records the update identification in the rewriteable memory unit or overwrites the present identification in the rewriteable memory unit by the update identification; (ELEMENT 13)

Identical to element 13 of claim 16.

wherein the external identification is from the old tire pressure detector, and the external signal is a low frequency (LF) signal. (ELEMENT 15)

Lemense sends the ID (retrieved from the old tire pressure detector) by a low frequency signal via LF transmitter 33. Lemense states, “Preferably, the service tool is used to replicate or clone the ID of a broken sensor unit into a replacement sensor unit over a LF communication link between the service tool and the replacement sensor unit” (3:57-60).

27. A tire pressure detecting system, comprising:

an identification rewriteable tire pressure detector used for being installed in a vehicle comprising: a micro-processing module having a rewriteable memory unit to record an identification; (ELEMENT 1’)

All the features of element 1 plus install on a vehicle, shown in both Tang and Lemense.

a sensing module electrically connected to the micro-processing module and having a pressure-detecting unit to detect a tire pressure and send a detection result to the micro-processing module; (ELEMENT 2)

a transmitting module controlled by the micro-processing module to transmit a radio frequency (RF) signal, wherein the RF signal comprises the detection result and the identification of the identification rewriteable tire pressure detector; (ELEMENT 3)

a power module electronically connected to the micro-processing module to supply power to the identification rewriteable tire pressure detector; and (ELEMENT 4)

an interface arranged to receive an external signal and send the external signal to the microprocessing module, whereing the external signal comprises an external identification to be written into the rewriteable memory unit or to be used to overwrite a present identification in the rewriteable memory unit; and (ELEMENT 5)

a portable setting apparatus arranged to communicate with the identification rewriteable tire pressure detector, comprising: **(ELEMENT 6)**

a control module; **(ELEMENT 7)**

an input module connected to the control module to enable an operator to manually input an identification to be written into the identification rewriteable tire pressure detector; **(ELEMENT 8)**

a receiving module connected to the control module to receive the RF signal from the identification rewriteable tire pressure detector or a tire pressure detector and to send the RF signal to the control module; **(ELEMENT 9)**

a setting output module controlled by the control module to send the external signal to the interface of the identification rewritable tire pressure detector, wherein the external signal is generated by the control module and comprises the identification that is provided by the input module or provided by the RF signal received from the receiving module; and **(ELEMENT 10)**

a power source connected to the control module to supply power to the setting apparatus; **(ELEMENT 11)**

Elements 2-11 of claim 27 are identical to elements 2-11 of claim 16; please see the above discussion.

wherein the portable setting apparatus is not equipped in the vehicle and is portable relative to the vehicle and is configured to:

obtain an update identification to be written into a new identification rewriteable tire pressure detector, wherein the update identification is either (1) an old identification of an old tire pressure detector, obtained by receiving the RF signal from the old tire pressure detector by the receiving module and retrieving the old identification from the RF signal, or (2) the identification manually inputted and retrieved from the input module, (ELEMENT 12')

Element 12' is nearly identical to element 12 of claim 16 with minor word order changes; please see the discussion for element 12'.

wherein the old tire pressure detector stores only the old identification; and (ELEMENT 12'')

Typically, an OEM tire pressure sensor (that is “the old tire pressure detector”) has only the ID programmed into it as part of the factory installation.

generate the external signal comprising the update identification as the external identification, and send the external signal to the new identification rewriteable tire pressure detector; and (ELEMENT 13')

Element 13' is part of element 13 above, please see discussion for element 13 of claim 16.

wherein the external identification is from the old tire pressure detector, and the external signal is a low frequency (LF) signal. (ELEMENT 15)

Please see discussion for identical element 15 in claim 26, above.

wherein the new identification rewriteable tire pressure detector is configured to:

acquire the update identification from the external signal; (ELEMENT 16)

Tang and Lemense both state the new sensor receives the new ID from the external signal of the setting tool/service tool.

when the rewriteable memory unit has the preset identification stored therein, overwrite the preset identification in the rewriteable memory unit by the update identification; and

when the rewriteable memory unit does not have the preset identification stored therein, record the update identification in the rewriteable memory unit. (ELEMENT 13'')

Please see discussion of element 13'' for claim 18.

2. METHOD CLAIMS

Turning to the method claims, it will be seen that these claims closely follow the features of the system claims and no additional features are added. Because the system claims included many method limitations, most of these features have been

discussed in detail. As these limitations correspond to the system limitations, reference will be made to those claim elements.

23. A tire pressure detector identification updating method comprising the steps of:

providing a setting apparatus comprising an input module and a receiving module;

Lemense service tool can read a pressure sensor label as well as receive RF signals, see FIG. 3 of Lemense.

obtaining, by the setting apparatus an update identification to be written into a new identification rewriteable tire pressure detector by either (1) receiving the RF signal from an old tire pressure detector by the receiving module of the setting apparatus by receiving radio frequency (RF) signal from the old tire pressure detector by the receiving module and retrieving the old identification of the old tire pressure detector from the RF signal, and storing the old identification in the setting apparatus for using the old identification as the update identification, or by (2) receiving a manual input of the identification from the input module, and using the identification as the update identification; and

This is substantially element 12 of claim 16 with the additional requirements that the setting apparatus receive the old ID by RF. This is shown in the RF receiver

31 of the Lemense setting tool of FIG. 3 which receives the old ID from the Tang universal tire pressure monitor.

when the update identification is the old identification from the old tire pressure detector, wirelessly writing the old identification into a new identification rewriteable tire pressure detector by the setting apparatus by generating an external signal comprising the old identification, and sending the external signal to the new identification rewriteable tire pressure detector such that the new identification rewriteable tire pressure detector records the update information in a rewriteable memory unit or overwrites a preset identification in the rewriteable memory unit by the update identification;

This is element 13” of claim 18 (which is similar to element 13 of claim 16). Lemense copies the ID from the old sensor and writes it into a new sensor.

verifying, by the setting apparatus, the update identification newly recorded in the rewriteable memory unit of the new identification rewriteable tire pressure detector, wherein the verifying step comprises:

receiving, by the setting apparatus, a wireless signal from the new identification rewriteable tire pressure detector, wherein the wireless signal comprises the update identification newly recorded in the rewriteable memory unit; and

judging, by the setting apparatus, consistency of the update identification newly recorded in the rewritable memory unit and the old identification of the old tire pressure detector.

This is element 14 of claim 16.

21. The method as claimed in claim 23, wherein the new identification rewriteable tire pressure detector is configured to record the update identification in the rewriteable memory unit or overwrite the preset identification in the rewriteable memory unit by the update identification by acquiring the update identification from the external signal; (ELEMENT 16)

Tang and Lemense both state the new sensor receives the new ID from the external signal of the setting tool/service tool.

when the rewriteable memory unit has the preset identification stored therein, overwrite the preset identification in the rewriteable memory unit by the update identification; and

when the rewriteable memory unit does not have the preset identification stored therein, record the update identification in the rewriteable memory unit. (ELEMENT 13’')

Please see discussion of element 13’’ for claim 18.

24. The method as claimed in claim 23, wherein the setting apparatus is configured to receive the RF signal wirelessly.

Lemense has an RF receiver 31 connected to an antenna 32 for receiving RF signals wirelessly in FIG. 3.

25. The method as claimed in claim 23, wherein the input module comprises a code scanner.

Lemense states that, when the old sensor RF transmitter does not function, the input method may be by reading a code from a printed label. Corniot reads a bar code from the pressure sensor by a scanner; using the scanner of Corniot in the “reading” feature of Lemense would have been obvious when reading a bar code label as “reading” includes optical scanning techniques in this art.

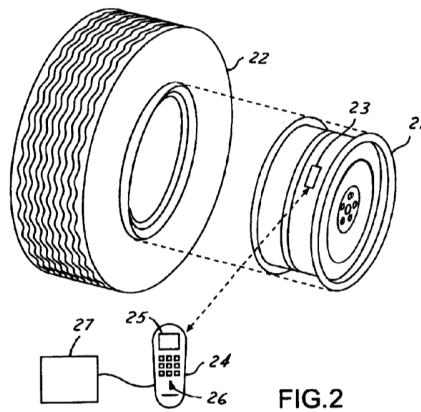
28. A tire pressure detector identification updating method comprising the steps of:

providing a portable setting apparatus comprising an input module and a receiving module, wherein the portable setting apparatus is not equipped in the vehicle and is portable relative to the vehicle;

The Lemense service tool can read a pressure sensor label as well as receive RF signals (“input module and a receiving module), see FIG. 3 of Lemense. The Lemense setting tool is a handheld tool 24 as seen in FIG. 2, above.

obtaining, by the setting apparatus an update identification to be written into a new identification rewriteable tire pressure detector by either (1) receiving the RF signal from an old tire pressure detector by the receiving module of the setting apparatus by receiving radio frequency (RF) [sic] signal from the old tire pressure detector by the receiving module and retrieving the old identification of the old tire pressure detector from the RF signal, and storing the old identification in the setting apparatus for using the old identification as the update identification, or by (2) receiving an input of a manually input identification from an input module of the setting apparatus, and using the manually input identification as the update identification, wherein the old tire pressure detector stores only the old identification;

This is substantially element 12 of claim 16 with the additional requirements that the setting apparatus receive the old ID manual. Lemense states that when the sensor unit is damaged, the code can be read from the printed label. As seen below, Lemense FIG. 2 shows setting tool 24 includes a control keypad 26. Thus, a service technician is capable of keying in the ID number from a printed label on the sensor unit, as suggested by Lemense.



when the update identification is the old identification from the old tire pressure detector, wirelessly writing the old identification into a new identification rewriteable tire pressure detector by the setting apparatus by generating an external signal comprising the old identification, and sending the external signal to the new identification rewriteable tire pressure detector such that the new identification rewriteable tire pressure detector records the update information in a rewriteable memory unit or overwrites a preset identification in the rewriteable memory unit by the update identification; and

This is element 13” of claim 18 (which is similar to element 13 of claim 16). Lemense copies the ID from the old sensor and writes it into a new sensor.

when the update information is the manually input identification from the input module, writing the manually input identification into the new identification rewriteable tire pressure detector by the setting apparatus by generating the external signal comprising the manually input identification,

and sending the external signal to a new identification rewriteable tire pressure detector such that the new identification rewriteable tire pressure detector records the update information in the rewriteable memory unit or overwrites the preset identification in the rewriteable memory unit by the update identification, wherein the external signal is a low frequency (LF) signal.

The Lemense service tool copies an ID from an old sensor and sends it to the new sensor to set as its ID. This process for sending the new ID by the LF signal is the same whether the service tool receives the ID from the old sensor by RF transmission or by reading from the sensor label (manual input).

29. The method as claimed in claim 23, wherein the verifying step further comprises:

if the update identification newly recorded in the rewriteable memory unit is not consistent with the old identification of the old tire pressure detector, performing the generating step.

Since the sensor being interrogated transmits its sensor ID and the service tool re-interrogates the sensor, it is deemed that the service tool of Lemense “judges the consistency” of the IDs since the service tool itself sent the ID that was programmed into the sensor.

In the alternative, the JP patent publication to Matsui teaches that, when a new ID (TID) is programmed into a tire pressure monitor by a setting tool, the setting

tool checks the sensor; if there is not a response based on that ID, the setting process terminates and a new setting process is initiated.

It would have been obvious to use the setting process of Matsui in the system of Tang/Lemense since checking to see that the ID has been correctly programmed is an important final step to ensure correct operation of the overall system, otherwise, the controller in the automobile will not be able to recognize the sensor (since it will not receive the correct ID from the sensor).

IX. THE BOARD SHOULD INSTITUTE IPR

1. The Board Should Not Deny Institution Under §325

Non-institution under §325(d) would be improper. The Office has not considered most of the prior art and all of the grounds in this Petition, which are materially different from and not cumulative of what has been considered in past EPRs. Lemense was cited during EPRs 2 and 3, but primarily used as a secondary reference with two other references since it was not recognized at that time by those requesters that Lemense was part of an identical aftermarket system composed of the Tang pressure detector and the Lemense setting tool for cloning an old sensor. Further, analogous claims in a Taiwan patent to Orange were held unpatentable by the Taiwan Intellectual Property Office using an analysis similar to that provided above and particularly citing Lemense and Corniot.

X. TAIWAN PATENT INVALIDATION PROCEEDINGS

The Patent Owner, Orange, has a Taiwan Patent, TW I522602 filed in Taiwan only a few weeks before the filing of the US patent application. Although Orange did not claim priority to the Taiwan patent application, Orange has repeatedly characterized the US patent (US 8,031,064) as the US counterpart to the TW patent (TW I522602) during invalidation proceedings in the Taiwan Patent Office (TIPO). TW I522602 was invalidated (final appeal) on January 25, 2024.

As background information, Orange filed a patent infringement action against Petitioner CUB in 2017, based on the TW patent. Orange lost in the first instance because the TW patent was considered invalid by the court, but appealed the judgment at least because the "US counterpart" of the TW patent was considered valid by the USPTO. Orange submitted the US patent and USPTO records during the trial procedure; however, the court dismissed the appeal and the case was made final.

The granted TW patent underwent a series of invalidity proceedings, during which Orange was permitted to amend its claims. As a result of these amendments, the final invalidated claims correspond to the claims of its US patent: the combination of a setting tool and a tire pressure sensor. Therefore, it is respectfully submitted that the invalidation by the TIPO should be considered in this IPR request.

Timeline

The granted patent, TW I522602, issued on February 21, 2016.

Claim 1 states:

1. A tire pressure detection device that can write a number, which includes a tire status detector that can write a number and a setter: the setter has: an input interface for the user to operate to receive or set a number; a controller connected to the input interface to read the number received or set by the input interface, and then set the number forming a number setting signal;

a setting transmission module, which can accept the control of the controller and output the number setting signal;

the tire status detector that can write the number has: a micro-processing control module that contains a readable and writable memory unit;

a sensing module, which is connected to the microprocessor control module to accept the control of the microprocessor control module, and senses a tire pressure value;

a transmission module, which is connected to the microprocessor control module, the control module is to accept the control of the micro-processing module, and transmit the sensing result of the sensing module with a radio frequency signal;

a receiving interface is connected to the micro-processing control module to accept the control of the micro-processing control module, receiving the number setting signal,

the microprocessor control module stores the number in the memory unit according to the received number setting signal, so that the number can be written into the tire condition detector that can write the number;

an electric power module, which provides the electric power required for the operation of the number-writable tire condition detector.

The translated TIPO final appeal invalidation opinion from January 25, 2024 is found in Exhibit 1009.

Decision or judgment	Date	Authority/Court	Details
Decision of the first cancellation action	27 August 2019	Taiwan Intellectual Property Office (TIPO)	The claim amendment filed by Orange on 19 June 2018 is accepted and Claims 1, 4, 5, and 10 are invalid. Claim 1 lacks an inventive step over any one of the following exhibit combinations. 1. Exhibits 1, 2, 3, and 8, 2. Exhibits 1, 2, 3, 8, and 9, 3. Exhibits 1, 2, 3, 8, 9, and 13, 4. Exhibits 1, 2, 3, and 12, and 5. Exhibits 1, 7, and 8. Claim 4 lacks an inventive step over any one of the following exhibit combinations. 1. Exhibits 2, 3, and 8, and 2. Exhibits 8 and 12. Claim 5 lacks an inventive step over the combination of Exhibits 2, 3, 7, 8, and 9. Claim 10 lacks an inventive step over any one of the following exhibit combinations. 1. Exhibits 1, 2, 8, and 9, and 2. Exhibits 8 and 12.
Decision of the appeal	8 January 2020	The Ministry of Economic Affairs (MOEA)	The appeal filed by Orange against the "TIPO Decision of the first cancellation action" is revoked.
Judgment of the first instance	20 August 2020	The Intellectual Property and Commercial Court (IP Court)	The administrative lawsuit filed by Orange against the "TIPO Decision of the first cancellation action" and

administrative lawsuit			the "MOEA Decision of the appeal" is dismissed.
Judgment of the second instance administrative lawsuit	28 July 2022	The Supreme Administrative Court	The appeal filed by Orange against the "IP Court Judgment of the first instance administrative lawsuit" is dismissed.

Decision or judgment	Date	Authority/Court	Details
Decision of the second cancellation action	30 November 2022	TIPO	The claim amendment filed by Orange on 13 September 2022 is accepted and Claims 2, 3, 6-9, and 11-14 are invalid. Claims 2 and 3 lack an inventive step over the combination of Exhibits 1 and 12. Claims 6, 7, 11, and 12 lack an inventive step over the combination of Exhibits 1, 10, 11 and 12. Claims 8, 9, 13, and 14 lack an inventive step over the combination of Exhibits 1, 10 and 12.
Decision of the appeal	16 May 2023	MOEA	The appeal filed by Orange against the "TIPO Decision of the second cancellation action" is revoked.
Judgment of the first instance administrative lawsuit	25 January 2024	IP Court	The administrative lawsuit filed by Orange against the "TIPO Decision of the second cancellation action" and the "MOEA Decision of the appeal" is dismissed.

XI. CONCLUSION

Petitioner respectfully requests institution of inter partes review and requests cancellation of all the patent claims: claims 16-19, 21, and 23-29.

Date: 3 April 2024

Respectfully submitted,

/Margaret Burke/

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Counsel for Petitioner

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), the undersigned certifies that this PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 8,031,064 C3 contains 13,916 words, exclusive of the Table of Contents, List of Exhibits/Authorities, and Mandatory Notices according to the word-processing program used to prepare this paper. The foregoing word count complies with the 14,000 word type-volume limit specified by 37 C.F.R. §42.24(a)(1).

Dated: 3 April 2024

Respectfully submitted,

/ Margaret Burke /

Margaret Burke

Reg. No. 34,474

Counsel for Petitioner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that, on the date below, a copy of this PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,031,064 C3 and copies of Petitioner's Power of Attorney and all supporting exhibits, were served by FedEx on the Patent Owner at the correspondence address of record for the subject patent as follows:

LOCKE LORD LLP

Attn: IP Docketing

P.O. BOX 55874

Boston, MA 02205

UNITED STATES

Dated: 3 April 2024

Respectfully submitted,

/ Margaret Burke /

Margaret Burke

Reg. No. 34,474

Counsel for Petitioner