

easily transmitted in the form of email or facsimile messages.

[0042] It should be clear to the reader that the invention is in no way limited to the embodiment described above, and that, within the scope of the invention, many different and advantageous embodiments and additions can be envisaged.

Claims

1. System to be used in wheeled vehicles, for registration, processing and storage of data with respect to trips of the vehicle, comprising means for data transfer between the system according to the present invention and suitable electronic devices in said vehicle or in the proximity of said vehicle, **characterised by** the fact that the system according to the present invention comprises means to control at least one other electronic device in such manner that through said electronic device, trip data as registered, processed and stored by the system according to the present invention, is transferred to one or more telecommunications and/or datanetworks outside the vehicle.
2. System according to claim 1, **characterised by** the fact that the system itself comprises means for transfer of said trip data to one or more telecommunications and/or datanetworks outside the vehicle.
3. System according to one of the preceding claims, **characterised by** the fact that trip data as registered, processed and stored by the system according to the present invention, comprises at least a trip number, date and time at the start of a trip, date and time at the end of a trip, the odometer reading at the start and at the end of a trip, and an identification of the purpose of the trip.
4. System according to one of the preceding claims, **characterised by** the fact that extra information can be added to trip data stored in the system according to the present invention, through an electronic device in the vehicle or in the proximity of the vehicle, which is suitable and comprises means for transfer of data between the system according to the present invention and said electronic device.
5. System according to claim 4, **characterised by** the fact that said extra information consists of an electronic representation of the vehicle's location at the start and at the end of a trip.
6. System according to claim 5, **characterised by** the fact that said electronic representation of the vehicle's location is determined by automatic detection of the cell of a cellular network for mobile communications in which the vehicle is located at a certain moment, and by using the known geographical location of this cell as an approximation for the location of said vehicle.
7. System according to claim 4, **characterised by** the fact that said extra information consists of an electronic representation of speech.
8. System according to one of the preceding claims, **characterised by** the fact that said system comprises at least the following parts:
 - a central control and processing unit, for instance a microprocessor, equipped with a suitable software program to provide for the right system functionality.
 - an electronic memory for storage of vehicle specific data like for instance a vehicle identification code and data necessary for calibration of the vehicle's electronic odometer signal.
 - an electronic memory for storage of trip data as registered and processed by the system according to the present invention.
 - electronic means to keep track of the current date and time.
 - means to detect whether the vehicle's ignition switch is being operated.
 - means to register the vehicle's electronic odometer signal.
 - means to connect a cable to establish datacommunication with electronic devices outside the system according to the present invention.
 - output means, suitable for issuing an optical and/or acoustical warning to a user of the system according to the present invention.
9. System according to claim 8, **characterised by** the fact that said detection whether the vehicle's ignition switch is operated, is realised by detecting significant changes in the electric potential on the supply lead of the standardised connector, which is provided in most recent model road vehicles to facilitate installation of for instance a car radio.
10. System according to claim 8, **characterised by** the fact that said electronic odometer signal is obtained by the system according to the present invention, through the standardised connector, which is provided in most recent model road vehicles to facilitate installation of for instance a car radio.
11. System according to claim 8, **characterised by** the fact that said output means for issuing an optical and/or acoustical warning to the user of the system according to the present invention, issues said warning when the available memory capacity for storing trip data has decreased below a specified

threshold value.

12. System according to claim 8, **characterised by** the fact that the system periodically derives data with respect to the distance travelled by the vehicle per unit time, from said electronic odometer signal, and stores said data in an electronic memory in the system according to the present invention. 5
13. System according to claim 12, **characterised by** the fact that said data with respect to the distance travelled by the vehicle per unit time are stored in said electronic memory in such manner, and that said electronic memory has such capacity, that a databuffer is created, which contains at all time a certain amount of the most recently registered data, equal to the storage capacity of said electronic memory. 10 15
14. System according to claim 8, **characterised by** the fact that at least the contents of said electronic memory for storage of vehicle specific data is secured by means of encryption in such manner that said data can only be entered, read-out and altered by an authorised person. 20 25
15. System according to one of the preceding claims, **characterised by** the fact that the system comprises an input means, which provides a possibility to a user of the system according to the present invention, to indicate whether the system should register the vehicle trip as business, private or commuting. 30
16. System according to one of the preceding claims, **characterised by** the fact that the system comprises means to detect whether the filling opening of the vehicle's fuel tank is in an open or closed state. 35
17. System according to one of the preceding claims, **characterised by** the fact that the system comprises means for data transfer by way of infrared light between the system according to the present invention and electronic devices in the vehicle or in the proximity of the vehicle. 40 45
18. System according to claim 17, **characterised by** the fact that said means for data transfer by way of infrared light, operate in conformity with the so-called "IrDA" (Infrared Data Association) communications standard. 50
19. System according to one of the preceding claims, **characterised by** the fact that the system comprises such means that data transfer between the system according to the present invention and electronic devices in the vehicle or in the proximity of the vehicle, is accomplished in conformity with the so-called "Bluetooth" de-facto standard for short-

distance radio communications.

20. System according to one of the preceding claims, **characterised by** the fact that parts of the system are placed in the vehicle in such manner and at such location(s) that said parts are mechanically attached to the vehicle and protected against unauthorised access and/or tampering, from within the vehicle's passenger compartment, as well as from outside the vehicle.
21. System according to one of the preceding claims, **characterised by** the fact that trip data and extra information as registered, processed and stored by the system according to the present invention, is transferred to telecommunications and/or datanetworks outside the vehicle, in the form of S.M.S. (Short Message Service)-messages.
22. System according to one of the preceding claims, **characterised by** the fact that trip data and extra information as registered, processed and stored by the system according to the present invention, is transferred to telecommunications and/or datanetworks outside the vehicle, in the form of email messages.
23. System according to one of the preceding claims, **characterised by** the fact that trip data and extra information as registered, processed and stored by the system according to the present invention, is transferred to telecommunications and/or datanetworks outside the vehicle, in the form of facsimile messages.

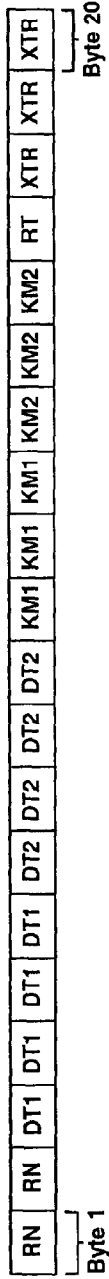


Fig. 2

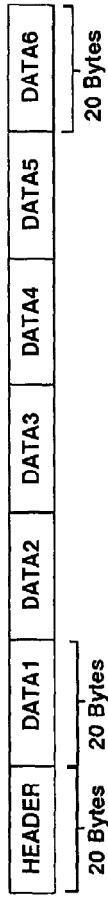


Fig. 3

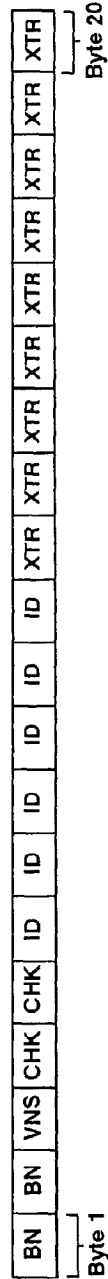


Fig. 4



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
19.12.2001 Bulletin 2001/51

(51) Int Cl.7: **G07C 5/00**

(21) Application number: **01304905.1**

(22) Date of filing: **05.06.2001**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(71) Applicant: **Meritor Heavy Vehicle Technology LLC**
Troy, Michigan 48084 (US)

(72) Inventor: **Ramsey, Reno**
Sterling Heights, Michigan 48313 (US)

(30) Priority: **12.06.2000 US 591970**

(74) Representative: **Barnfather, Karl Jon, Dr. et al**
Withers & Rogers, Goldings House, 2 Hays Lane
London SE1 2HW (GB)

(54) **Personal data computer for vehicle monitoring**

(57) A personal computer, generally of the type commonly available under the trade name Palm Pilot™ is utilized on a heavy vehicle to obtain information. The information may be analyzed by software provided on the computer. The computer is removed from a docking module on the vehicle and plugged into a docking module at a headquarters base. Data can then be downloaded to the headquarters. At the same time, the headquarters can upload information into the computer which

may be then downloaded into the vehicle when the computer is returned to the vehicle. The information taken from the vehicle to the computer may include trip information such as mileage, state line crossing, etc. The information uploaded into the computer may include trip information which can then provide instructions to a navigation system on the vehicle. Moreover, the system may also provide diagnostic analyses while on the vehicle.

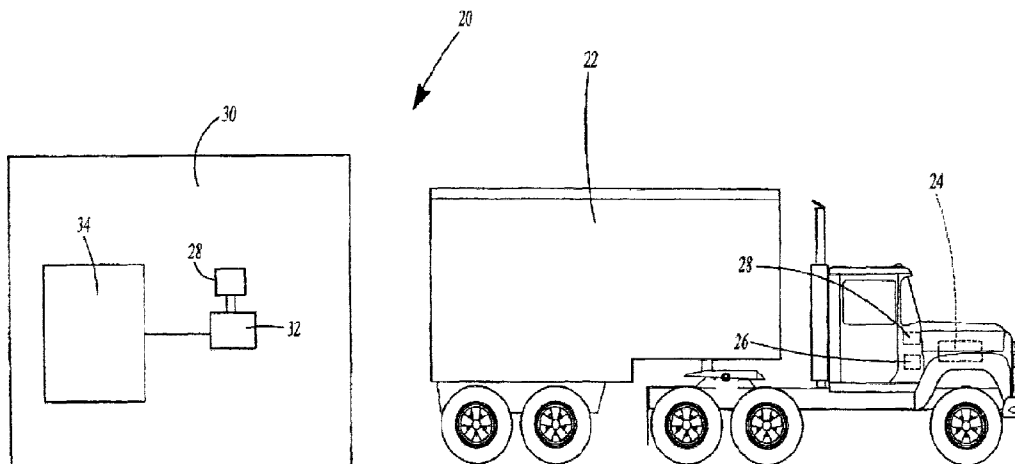


Fig-1

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