METHOD AND APPARATUS

Inventors: Robert R. Chambers, Scarsdale, N.Y.; Rudolph S. Stokan, Harvey, Ill.

Assignee: Atlantic Richfield Company, New York, N.Y.

Filed: Jan. 2, 1970

App. No.: 19

U.S. Cl. ..................................................141/1, 137/234.6, 141/98, 141/232, 235/151

Int. Cl. ..................................................B67D 5/00

Field of Search ...........................................137/234.6; 141/98, 1, 231, 141/232, 233, 266, 279, 284, 248; 222/192; 235/151, 151.2, 151.34

References Cited

UNITED STATES PATENTS


ABSTRACT

A new method and apparatus for filling a vehicle gasoline tank and automatically recording the identity of the vehicle and the amount of gasoline added is disclosed. These systems are further useful in a method for periodically maintaining a group of vehicles which are parked for a relatively long time as in a daily parking lot. The vehicles can thus be maintained with gas, oil, etc., without the necessity for the owner or driver being present.

15 Claims, 4 Drawing Figures
FIG. 4.

INVENTORS
ROBERT R. CHAMBERS &
RUDOLPH S. STOKAN

BY 
McLean, Morton & Boustead
ATTORNEYS
METHOD AND APPARATUS

This invention relates to an improved method and apparatus for filling the gasoline tank of a vehicle, such as an ordinary automobile, and automatically recording the identity of the vehicle and the amount of gasoline added. Apparatus for performing the method is also disclosed. These systems are useful in a method for periodically maintaining one or more of a larger group of vehicles which are parked for a relatively long time, such as is typically found in the commuter parking lots within any large urban area or any major employment center. The vehicle or vehicles can thus be maintained automatically with gas, oil, etc., without the necessity for the owner and/or driver being present.

In today’s society, large numbers of people commute to work daily by car. Often these cars are left parked all day in a parking lot which can be adjacent to the work place of the commuter or at a relatively short distance away. The cars are parked generally in the morning, are left on the lot all day and then are retrieved at the end of the work day for the drive home. These vehicles, of course, require periodic maintenance as well as refueling of gasoline and changes of oil, with the refueling of gasoline being more prevalent generally than maintenance. For the average commuter refueling requires an added stop during his commuting trip to work or to home thus lengthening his trip and causing some inconvenience. It has been occasionally suggested that the commuter park his car at a convenient gasoline station and/or garage where this periodic maintenance and refueling can be done during the day. However, the number of these service stations and/or garages in relation to the number of commuters is very small. Also, under present practice the commuter has no way of determining exactly what was done to his vehicle in terms of refueling and/or maintenance other than what is told to him when he returns to the car. Many people are reluctant to leave their automobiles in such a situation. Some refueling and periodic maintenance can be achieved by effect bringing service stations to the automobile, that is providing a transportable gasoline carrying vehicle which could be used to refuel the automobile wherever it is parked. However, the commuter still has no concrete idea of exactly how much fuel is added and a particular commuter may not be interested in this kind of service.

It has now been found that many of the problems associated with on the site refueling and maintenance can be alleviated through the use of a portable maintaining unit along with a means to identify the vehicle to be maintained and further means to record the amount of maintenance and refueling done. Utilization of the invention herein disclosed provides the commuter who uses the service with a record of the amount and cost of the fuel applied to his car and the type of maintenance which has been done. The auto owner is thus provided with a permanent true record of the work which has been performed. The services are done during the day while the automobiles are parked in their commuting lot thus eliminating any need for stopping on the way to or from work on the part of the commuter. Utilization of the invention as disclosed herein will thus result in a saving of time for most of the people using the service. The invention will be further described herein referring to a large parking lot which can be considered typical of those found in large urban centers or in any work area where a plurality of cars are parked during the day.

The commuter who partakes in the periodic maintenance system herein described may be given a means to identify his vehicle by the clear view of an alphanumeric code of a particular color or size so as to be readily observable to anyone walking in the approximate area of the vehicle or this means can be in the form of a card board or other paper-type sheet which can be inserted in the windshield or back window area so as also to be readily observable.

Once the vehicle is identified as being a member of this service, the maintenance program can be started. The vehicle can be taken to a servicing unit or, alternatively, a servicing unit can be established in the proximate area of the vehicle. The latter, e.g., establishing the servicing unit in the approximate area of the vehicle, is preferred because of savings in time. The driving of cars to and from the servicing unit can be time-consuming and this time increases with the increasing number of vehicles taking part in the program. As will become even more apparent below, the use of this latter method offers increasing efficiencies for the operators of the program as the percentage of cars within a large parking area taking part in the program increases.

The servicing unit can include a gasoline storage unit, a gasoline transfer means such that gasoline can be transferred from the servicing unit to the vehicle to be serviced, an automatic code identifier and a recording means. The gasoline transfer means is inserted into the gasoline delivery or receiving means of the vehicle gasoline tank and gasoline is added to fill the tank. The gasoline receiving means of the vehicle gasoline tank preferably contains an identity means. The identity means is adapted to identify the vehicle by a predetermined code such that when the gasoline transfer means from the servicing unit is inserted into the said gasoline receiving means the vehicle can be identified by code in the servicing unit code identifier. As the amount of gasoline is added to the gasoline vehicle tank through the gasoline receiving means, the amount and its concomitant price is further recorded in the recording means on the servicing unit by suitable electrical or mechanical means.

The inventions will be more fully described below with reference to the appended drawings in which

FIG. 1 is a representation of the process of this invention in which a parked vehicle is being serviced from a servicing unit established in the proximate area of the vehicle;

FIG. 2 is a schematic representation of one embodiment of a vehicle gasoline tank identity means suitable for use in the present invention;

FIG. 3 is a schematic representation of an electrical circuit including the vehicle gasoline tank identity means; and

FIG. 4 is a schematic representation of a second embodiment of a vehicle gasoline tank identity means suitable for use in the present invention.

The large parking lot 1 shown generally in FIG. 1 is typical of those encountered in urban centers and work areas. As shown therein, a number of vehicles 2 are parked in rows 3, generally two autos deep with an open aisleway 4 between adjacent rows.

A servicing unit 5 can be established in an aisleway 4 to service the particular vehicles parked adjacent that aisleway. The servicing unit 5 is preferably motorized, either as an integral unit or it could be, for example, mounted behind and connected to a cab-type motorizing means. The servicing unit 5 can include a gasoline storage unit 6, gasoline transfer means including a pump 6' and delivery means 7 such as a hose of a length sufficient to service the vehicles in the proximate area, which can be, for example, up to about 20 feet or more, of the servicing unit, an automatic code identifier 8 and a recording and printing means 9. The servicing unit can also contain a number of accessories (not shown) such as oil cans, rags, windshield wipers, battery water storage and transfer means, etc., useful in performing accessory services to a vehicle. Although the automatic code identifier 8 and the recording and printing means 9 are shown as discrete units in the servicing unit, they may also be physically combined into one unit.

The servicing unit can be established in the proximate area of a particular vehicle 10 which is identified as a member of the periodic maintenance system, as by means of the sticker 11 located on the rear bumper of vehicle 10. The gasoline transfer means 7 can be inserted into the gasoline receiving
means of the vehicle gasoline tank, indicated generally as 12. As is more fully explained hereinbelow, the gasoline receiving means of the vehicle gasoline tank contains an identity means and identifies the particular vehicle being serviced by a predetermined code so that when the gasoline transfer means 7 is inserted into the gasoline receiving means the vehicle is automatically identified in the code identifier 8 in the servicing unit 5. As gasoline is added to the vehicle gasoline tank from the storage tank 6 through the transfer means 7, the amount of gasoline transferred and its concomitant price is further recorded in the recording means 9 on the servicing unit 5 by suitable electrical or mechanical combination.

The identity means can be permanently attached to the vehicle receiving means which is a part of the vehicle gasoline storage tank. Such identity means can be any suitable electrical or mechanical combination which will identify the vehicle being serviced by means of a predetermined code. The identity means as is more fully explained below, is adapted to insure that the gasoline is delivered into the vehicle.

One such vehicle identity means is illustrated in FIG. 2. The identity means therein shown is disposed in an annular ring 13 adapted to be located about the mouth 12a of the vehicle gasoline receiving means 12. The identity means is preferably permanently connected to the gasoline receiving means as, for example, by welding or brazing or soldering, although the identity means can be attached by means of a chain or other suitable connecting means. The ring 13 can contain projecting pins 14, 15, 16, 17, 18 and 19, each connected to one end of an associated resistance elements 20, 21, 22, 23, 24 and 25, respectively. Each of the resistance elements 20 through 25 has its second end connected to a common terminal 26 which is further connected to projecting pin 27 by wire 28. The ring 13 can further contain projecting pins 29 and 30 which are connected to each other by wire 31.

The resistance elements 20 through 25 can have a sequence of values which are arranged to correspond to the identification number assigned to the vehicle. Each digit of the number will be represented by one resistor so that only the first digit of the resistance value would be used. This makes unnecessary the use of high precision ultrastable resistors of correspondingly high price and enables the use of lower precision resistors of a lower cost. For example, resistors of values 500 ohms, 1,500 ohms, 2,500 ohms, 3,500 ohms, etc., could be used to represent the digits 0 through 9; a six-digit number such as 123457 could be identified by a ring containing resistors of the following values arranged in sequence: 2,500, 2,500, 1,500, 500, 5,000, 5,000, 4,500, and 7,500 ohms.

The gasoline transfer means 7 can contain at its delivery end a mating socket 32 which contains sockets 33, 34, 35, 36, 37 and 38 adapted to mate with projecting pins 14, 15, 16, 17, 18 and 19, respectively. Similarly, mating socket 32 contains sockets 39, 40 and 41 adapted to mate with projecting pins 29, 30 and 27 respectively. The central aperture 42 of the transfer means 7 is further adapted to correspond with the mouth 12a of the vehicle receiving means. The mating socket 32 is adjusted to be joined with the identity means such that each of the projecting pins is disposed in its respective socket and the apertures 12 and 42 are in correspondence. This joining can be facilitated by the provision of suitable means (not shown) on the circumferences of the socket and ring such as reference lines or a dove and tail joint. Other suitable means may also be employed.

As is shown in FIG. 3, each of the sockets 33 through 41 is connected to wires 42 through 56, which can be arranged peripherally around the circumference of the transfer means 7, and each wire is then connected to the master control apparatus, indicated generally as 52.

The master control apparatus 52 includes a power source 53 which is connected to a master control relay 54, the output of which controls a motor starter 55 which in turn is connected to the gasoline storage unit pump 56. The output of relay 54 is also connected to the recording and printing means 9, which in addition receives a binary coded decimal input from digital ohmmeter 57. Stepping switch 59 includes two sections 60 and 61 of contacts. The resistance elements 20, 21, 22, 23, 24 and 25, respectively, are connected through the corresponding projecting pins 14 through 19 and sockets 33 through 38 and through wire leads 42 through 47 to step contacts 62, 63, 64, 65, 66 and 67, respectively, in section 60 of stepping switch 59. The rotary contact arm 68 of section 60 is connected to the input of digital ohmmeter 57 by wire 86. Common terminal 26 is connected via its projecting pin 27 and socket connection 41 and via line 50 to the input of digital ohmmeter 57. The joined contacts 29 and 30 are connected via sockets 39 and 40 and via wires 48 and 49 to the master control relay 54.

Section 61 of the stepping switch 59 contains at least one more contact than the number of digits in the identification code. In the embodiment herein described, a six-digit number has been used. Section 61 therefore contains at least seven contacts of which the seventh contact 71 is connected by wire 72 to motor starter 55. The rotary contact arm 77 of section 71 is also connected to the master control relay 54 by wire 78. The rotary contact arms 68 and 77 are mechanically driven, as indicated generally at 79 and 80, by the stepping switch step coil 81 and reset coil 82. These coils each have their common terminal connected to one terminal of master control relay 54 by wire 83. Step coil 81 is connected to the recording and printing means 9 by wire 87, and reset coil 82 is connected to the second terminal of master control relay 54 by means of wire 84 and normally open momentary contact switch 85. Switch 85 can alternatively be of an automatic operation as is more fully explained below.

Another suitable vehicle identity means is illustrated in FIG. 4. In this embodiment, the suitable electrical or mechanical combination is incorporated into the vehicle gasoline tank cap 13' which is adapted to fit about the end of the vehicle gasoline receiving means 12. The cap 13' is permanently attached to the receiving means 12 or to another part of the vehicle by means of a chain or other suitable connecting means whereby the cap can be removed from the receiving means 12 to allow the transfer means 7 to be inserted but, preferably without allowing the cap 13' to be moved away from the proximity of the receiving means. The chain can thus be a length of, for example, a few inches, such as about 2 to 3 inches.

The cap 13' can contain projecting pins 14', 15', 16', 17', 18' and 19', each connected to one end of the associated resistance elements 20', 21', 22', 23', 24' and 25', respectively, in the same manner as the embodiment of FIG. 2. Similarly, each of the resistance elements 20' through 25' has its second end connected to a common terminal 26' which is also a projecting pin. The cap 13' can further contain projecting pins 29' and 30' which are connected to each other by wire 31'. In this embodiment, the mating socket 32' on gasoline transfer means 7, adapted to mate with cap 13', can be positioned on the periphery of the transfer means 7 at a distance, say 3 to 5 inches, above the delivery end. If the cap 13' is attached by a 2-inch chain and the delivery end of the transfer means 7 extends about 3 to 5 inches into the receiving means 12, the necessary mating can be accomplished. However, such mating without the transfer means 7 being within the receiving means 12 will be difficult, thereby assuring that the gasoline is delivered into the tank. The mating socket 32' contains sockets 33' through 41' which correspond in function to sockets 33 to 41 of the embodiment of FIG. 3 and are connected through wires 42' through 50' to master control apparatus 52 identified to that shown in FIG. 3 as 52. This embodiment functions in the same manner as hereinafter set forth for the embodiment of FIGS. 2 and 3.

In operation, when the mating socket 32 is connected to the identity means, lines 48 and 49 are tied together by line 51. This energizes master control relay 54. As a consequence, step coil 81 of stepping switch 59 is energized to step arms 68 and 77 in unison over the contacts of stepping switch sections 60 and 61, respectively when actuated by printer 9. Digital ohmmeter 57 "reads" the value of resistance element 20 through
contact position 62. The first digit of this value is transmitted by BCD code through wires 69 and 70 to printer 9. Printer 9 energizes step switch coil 81 through wire 87 to advance rotary contact arm 68 to contact position 63. The first digits of resistance values of the remaining resistance elements through 25 are then received by printer 9 as the rotary contact arm 68 of section 60 advances to each successive contact position 62 through 67. These values are recorded on a suitable ticket means in the recording and printing means 9 as the vehicle identification code number. After rotary contact 68 reaches contact position 67 the code number has been completely read, and step coil 81 is again activated to step contact arm 77 to position 71. Power is then provided from relay 54, through section 61 of the stepping switch 59 to activate the motor starter 55 of fuel pump motor 56. At this point, gasoline is transferred from the storage unit 6 to the vehicle through the transfer means 7. The gasoline storage unit 6 can further be provided with metering means (not shown) which is adapted to measure the amount of gasoline transferred from the storage tank to the vehicle. This information can also be supplied to the recording and printing means 9 by suitable means (not shown) for inclusion on the ticket means.

When the gasoline transfer is completed and the mating socket 32 removed from the identity means, the stepping switch reset switch 85, can be activated to reset the stepping switch 59 to its original "rest" position. The activation can be performed manually by the servicing unit operator or automatically by the inclusion of suitable means to be activated when the mating socket-identity means joint is disengaged.

While an annular ring disposed about the mouth of the gasoline receiving means and a gasoline receiving means cap, both containing resistance elements have been disclosed above to exemplify two modes of establishing the vehicle code means, it is recognized that these are not the only alternatives in which the code identification can be made and transmitted to the recording means. Other suitable identification means can be used; and is preferably arranged so that when identifying contact between the gasoline delivery and receiving means is made, the delivery means is positioned so that the gasoline can only go into the receiving means and the vehicle tank.

The recording means on the servicing unit can be, as noted before, a printer or card punch or other suitable device. The recording means is also preferably adapted to record the amount of gasoline and the price for the gasoline delivered to the vehicle. The recording means thus provides a permanent copy of the amount of work and the price thereof done to the vehicle. Preferably, at least one copy of the printed or punched bill is made so that after the refueling has taken place a copy can be left for the owner or driver of the vehicle as by leaving it under the windshield wiper.

At the time during which the refueling is taking place, other amenities of typical service station operations such as cleaning the windshield and other windows of the vehicle, checking the air in the vehicle tires, checking the oil and water levels can be performed. If, for example, the oil is found to be low, it can be refilled by manual means by the operator of the servicing unit which can carry oil in suitable containers such as are now presently available. The servicing unit can also contain various means to perform the other ancillary operations such as a compressed air tank to add air to the tires of the automobile and water tanks with suitable water delivery means so that, for example, the battery or radiator can be refilled. At the same time as the ticket is left with the automobile, the operator of the servicing unit can note thereon other deficiencies which he has noted which would require approval by the owner or driver before fixing. For example, if while checking the oil and water it is noticed that a fan belt is loose or is beginning to wear or if the oil appears dirty and should be changed, a notation to that effect can be made on the printed slip left for the driver so that instructions may be left for the performance of these operations. These further operations could be performed while the car is being left for the day either in the lot where it is usually left or, if prior arrangements are made, the vehicle can be transferred to a service station and be returned during the day.

It has been found in a large scale consideration of the operation thus disclosed above that by regular servicing of this type that the average vehicle only requires refueling approximately twice a week, e.g., Mondays and Thursdays, or Tuesdays and Fridays. It has also been found that the underhood services noted are generally required on an average of about once a week. The invention of this application thus will allow a one-man operated service unit to service a large number of cars in one area.

We claim:

1. A method for periodically maintaining a vehicle left parked and unattended which comprises, establishing in the proximate area of the vehicle a servicing unit which includes a gasoline storage unit, gasoline transfer means, an automatic code identifier and recording means;

2. The method of claim 1 further comprising providing a permanent record of the gasoline transferred.

3. The method of claim 2 wherein the permanent record is provided by the automatic recording means.

4. An improved method for filling a vehicle gasoline tank with gasoline and identifying the particular vehicle comprising:

   establishing in the same proximate area a vehicle and a servicing unit which includes a gasoline storage unit, gasoline transfer means, an automatic code identifier and recording means;

   arranging the gasoline transfer means for delivery of gasoline into the gasoline tank filler means of the vehicle, identifying the particular vehicle in the automatic code identifier;

   transferring gasoline from the gasoline storage unit to the vehicle gasoline tank, and recording the amount of gasoline transferred.

5. Apparatus for dispensing gasoline to a vehicle and identifying the vehicle to which the gasoline is dispensed comprising:

   a. Vehicle identification means adapted for attachment to a vehicle for identifying the particular vehicle to which the vehicle identification means is attached; and

   b. Vehicle servicing means including:

      1. vehicle identification sensing means adapted to connect to vehicle identification means to sense the identity of the particular vehicle identified by the vehicle identification means;

      2. gasoline storage means;

      3. gasoline transfer means connected to the gasoline storage means and adapted for transferring gasoline from the gasoline storage means to a vehicle gasoline inlet pipe; and

      4. recording means connected to the gasoline transfer means and to the vehicle identification sensing means for recording the identity of the particular vehicle sensed by the vehicle identification sensing means and the amount of gasoline transferred from the gasoline storage means to the vehicle gasoline inlet pipe.

6. The apparatus of claim 5 wherein said recording means includes means to record the price of the gasoline transferred from the gasoline storage means.
7. The apparatus of claim 5 wherein said vehicle identification means are coded means adapted to be attached to a vehicle gasoline inlet pipe cap, said cap being secured to a vehicle.

8. The apparatus of claim 7 wherein the vehicle identification means comprise a plurality of resistance elements disposed in sequence and having resistance values corresponding to a numerical code identifying the vehicle.

9. The apparatus of claim 8 wherein the gasoline transfer means includes suitable connecting means to transmit the resistance values of the identity means to the recording means.

10. The apparatus of claim 9 wherein the resistance elements of the vehicle identification means are connected to projecting pins and the gasoline transfer means includes sockets adapted to correspond with the projecting pins.

11. The apparatus of claim 10 further comprising a stepping switch connected to the sockets to receive the resistance value of each of the resistance elements in succession, and means to energize the gasoline transfer means after all the resistance values have been determined.

12. The apparatus of claim 11 wherein said stepping switch comprises two sections of contacts which operate in unison, the first section of which is connected to the resistance elements and to the recording means whereby the values of the resistance elements are determined in succession and transferred to the recording means and the second section of which contains one more contact than the number of resistance elements, said last contact being connected to a motor starter whereby when said contact is energized, the motor starter energizes the gasoline transfer means.

13. The apparatus of claim 12 further including means to deactivate the motor starter when contact between the gasoline transfer means and vehicle identification means is ceased.

14. The apparatus of claim 5 further comprising a vehicle having a gasoline tank and a gasoline inlet pipe connected to the gasoline tank, the vehicle identification means connected to the vehicle adjacent the vehicle gasoline inlet pipe.

15. The apparatus of claim 14 further comprising connecting means connecting the vehicle identification sensing means to the gasoline transfer means, said connecting means in conjunction with the manner of connection of the vehicle identification means to the vehicle ensuring that the gasoline transfer means is within the vehicle gasoline inlet pipe when gasoline is transferred from the gasoline storage means.

* * * *