US006185501B1

(12) **United States Patent**
Smith et al.

(10) **Patent No.: US 6,185,501 B1**
(45) **Date of Patent: *Feb. 6, 2001**

(54) **METHODS AND APPARATUS FOR LOADING OR MODIFYING A VEHICLE DATABASE FROM A REMOTE COMPUTER VIA A COMMUNICATIONS NETWORK AND A FUEL OR CURRENT DISPENSER**

(75) Inventors: **Harry F. Smith**, Newtown; **Mark F. Harrington**, Fairfield, both of CT (US)

(73) Assignee: **Intellectual Property Development Associates of Connecticut, Inc.**, Trumbull, CT (US)

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **09/130,283**

(22) Filed: **Aug. 6, 1998**

Related U.S. Application Data

(63) Continuation of application No. 08/252,832, filed on Jun. 2, 1994, now Pat. No. 5,806,018, which is a continuation-in-part of application No. 08/066,967, filed on May 25, 1993, now Pat. No. 5,327,066.

(51) **Int. Cl.**[7] **G06G 7/78**

(52) **U.S. Cl.** **701/200**; 701/207; 701/24; 320/109; 235/384; 340/825.34; 340/825.35; 340/438

(58) **Field of Search** ..... 701/200, 202, 701/206, 207, 210, 208, 209, 214; 320/2, 48, 21, 17, 18, 43, 49, 109, 128, DIG. 18; 340/436, 438, 439, 825.33, 825.34, 825.35, 825.44, 825.69; 235/384, 381, 376, 379, 382, 383, 380, 435, 375; 700/286, 291; 702/177, 188, 63, 130, 138; 705/413, 13, 34

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,263,945	4/1981	Van Ness	141/98
4,309,644	1/1982	Reimers et al.	318/139
4,347,472	8/1982	Lemelson	320/2
4,383,210	5/1983	Wilkinson	320/2
4,404,641	9/1983	Bazarnik	702/177
4,528,643	7/1985	Freeney, Jr.	705/52
4,532,418	7/1985	Meese et al.	235/381
4,532,511	7/1985	Lemelson	340/933

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

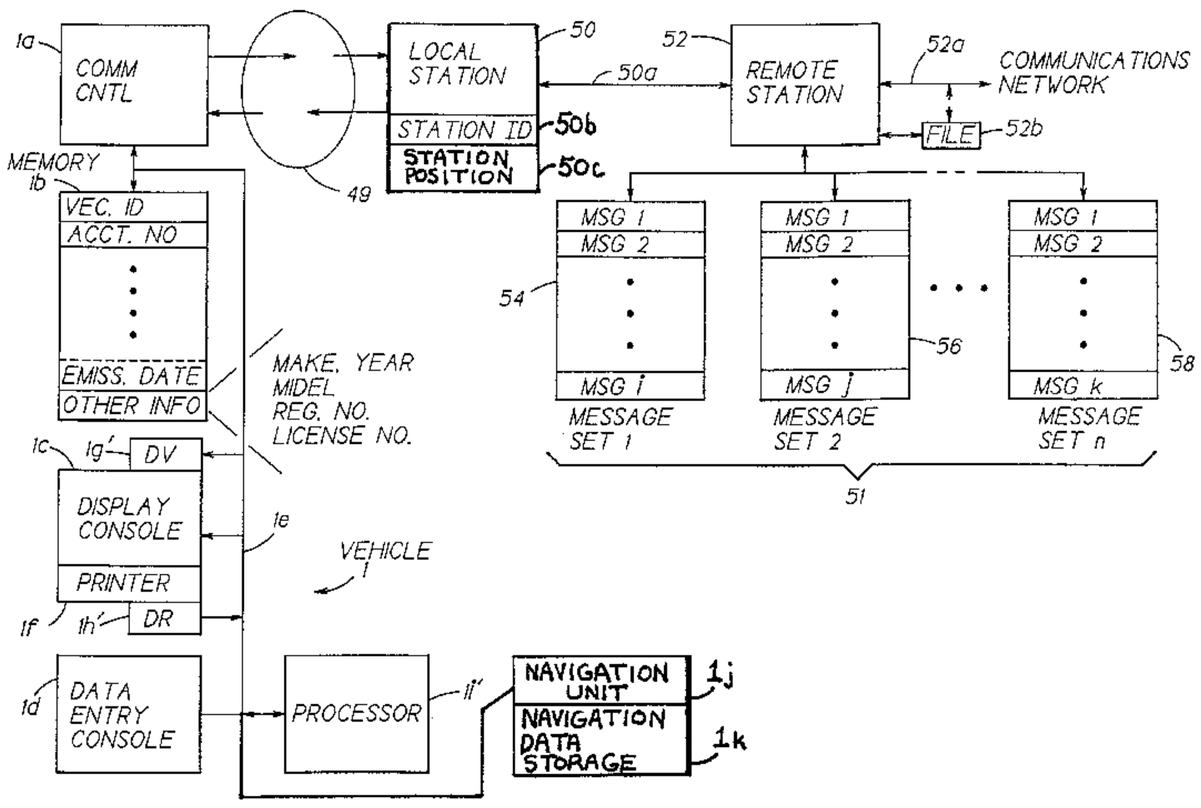
0 306 088	3/1989	(EP)	G09B/29/10
62-297259	5/1989	(JP)	G01C/21/00

Primary Examiner—Jacques H. Louis-Jacques

(57) **ABSTRACT**

Method and apparatus providing supplementary navigation data to be used with a vehicular navigation system. The supplementary navigation data can be superimposed over primary navigation data on a navigation system display or can be presented as a split-screen display. The supplementary navigation data may contain information such as locations of local facilities, local road information, types of local facilities. The supplementary navigation data is received by the vehicle when the vehicle is coupled to a station, such as a battery recharging or a refueling station, and is transmitted to the navigation system. An on-board controller can store the data and/or display the data. The navigation system could use the supplementary data to determine routes or locations for specific local facilities selected by the user. In an interactive or two-way communications system, the user can select predetermined types of supplementary data to be received. The supplementary navigation data is preferably transmitted to the navigation system at a local vehicle station, such as a refueling station, a vehicle rest stop, a vehicle tourist center, etc. Position update information can also be entered for resetting or recalibrating an internally maintained vehicle position.

40 Claims, 8 Drawing Sheets



U.S. PATENT DOCUMENTS

4,800,328	1/1989	Bolger et al.	320/2
4,804,937	2/1989	Barbiaux et al.	340/52 F
4,861,971	8/1989	Chan	235/384
4,876,540	10/1989	Berthon et al.	340/932.2
4,880,097	11/1989	Speas	194/239
4,965,574	10/1990	Fukushima et al.	340/995
4,967,895	11/1990	Speas	194/200
4,977,509	12/1990	Pitchford et al.	701/207
4,983,984	1/1991	Shibone et al.	343/711
5,003,476	3/1991	Abe	701/33
5,003,520	3/1991	Grieu et al.	368/90
5,049,802	9/1991	Mintus et al.	320/2
5,053,774	10/1991	Shuermann et al.	342/44
5,058,044	10/1991	Stewart et al.	702/184
5,072,380	12/1991	Randelman et al.	705/13
5,111,401	5/1992	Fuccett, Jr. et al.	701/24
5,115,398	5/1992	DeJong	701/200
5,157,319	10/1992	Klontz et al.	320/2
5,159,556	10/1992	Schortee	701/210
5,170,352	12/1992	McTamaney et al.	701/26
5,184,303	2/1993	Link	701/210
5,202,617	4/1993	Nor	320/2
5,204,819	4/1993	Ryan	705/413
5,208,756	5/1993	Song	455/456
5,263,565	11/1993	Wilkinson	194/216
5,307,278	4/1994	Hermans et al.	701/217
5,327,066	7/1994	Smith	320/2
5,351,052	9/1994	D'Hont et al.	342/42
5,353,023	10/1994	Mitsugi	340/989
5,353,034	10/1994	Soto et al.	342/457
5,359,522	10/1994	Ryan	705/413
5,365,449	11/1994	Kashiwazaki	701/208
5,422,624 *	6/1995	Smith	340/438
5,451,755	9/1995	Duval et al.	235/381
5,479,157 *	12/1995	Suman et al.	340/825.31
5,487,002 *	1/1996	Diller et al.	701/22
5,499,181 *	3/1996	Smith	701/29
5,557,268	9/1996	Hughes et al.	340/933
5,717,374 *	2/1998	Smith	340/438
5,742,229 *	4/1998	Smith	340/438
5,806,018 *	9/1998	Smith et al.	701/211
5,914,654 *	6/1999	Smith	340/438
6,018,293 *	1/2000	Smith	340/438
6,067,008 *	5/2000	Smith	340/348

* cited by examiner

FIG. 1a

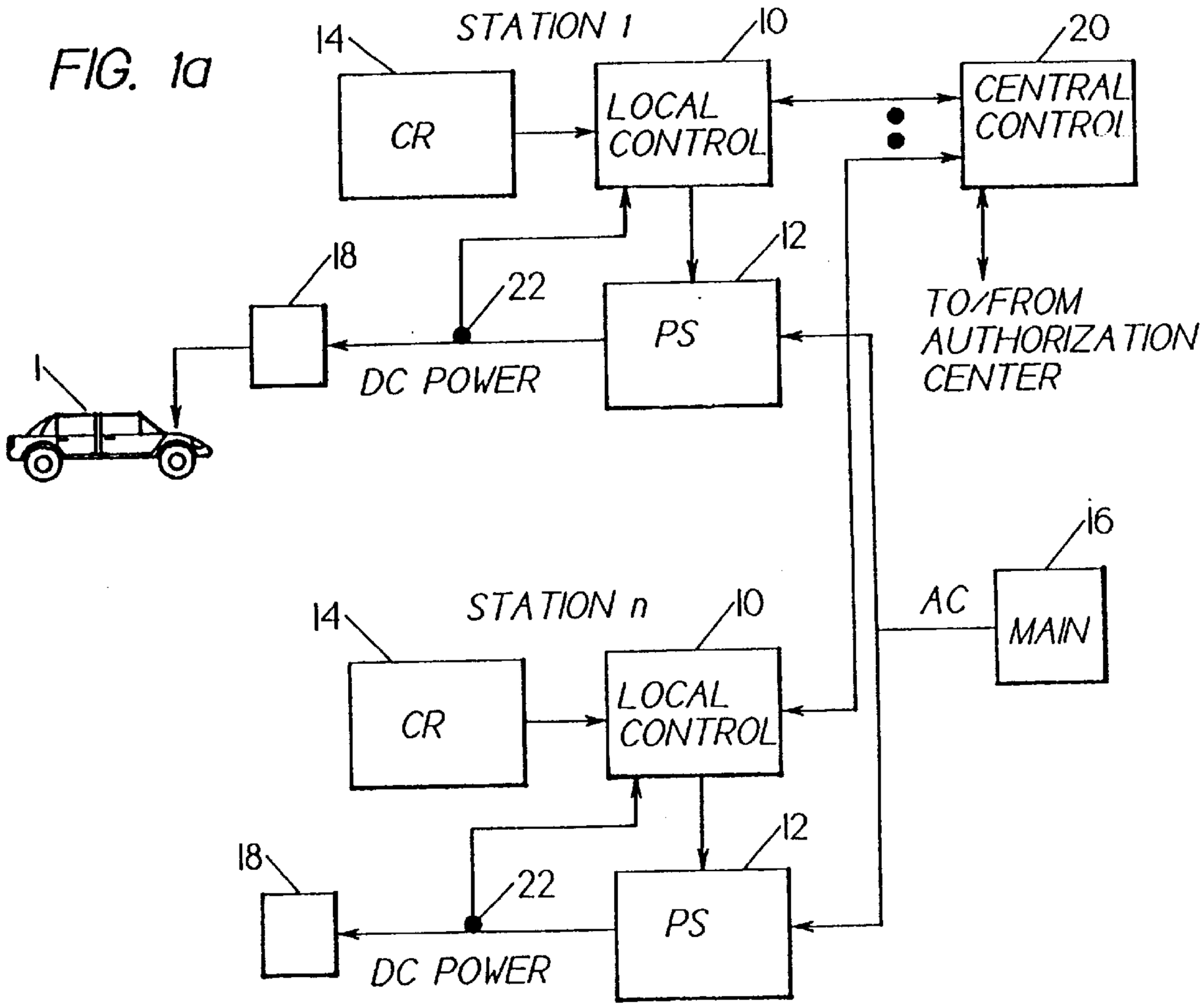

STATION 1
14
CR
10
LOCAL CONTROL
20
CENTRAL CONTROL
18
22
12
PS
TO/FROM AUTHORIZATION CENTER
1
DC POWER
STATION n
14
CR
10
LOCAL CONTROL
16
AC
MAIN
18
22
12
PS
DC POWER

FIG. 1b

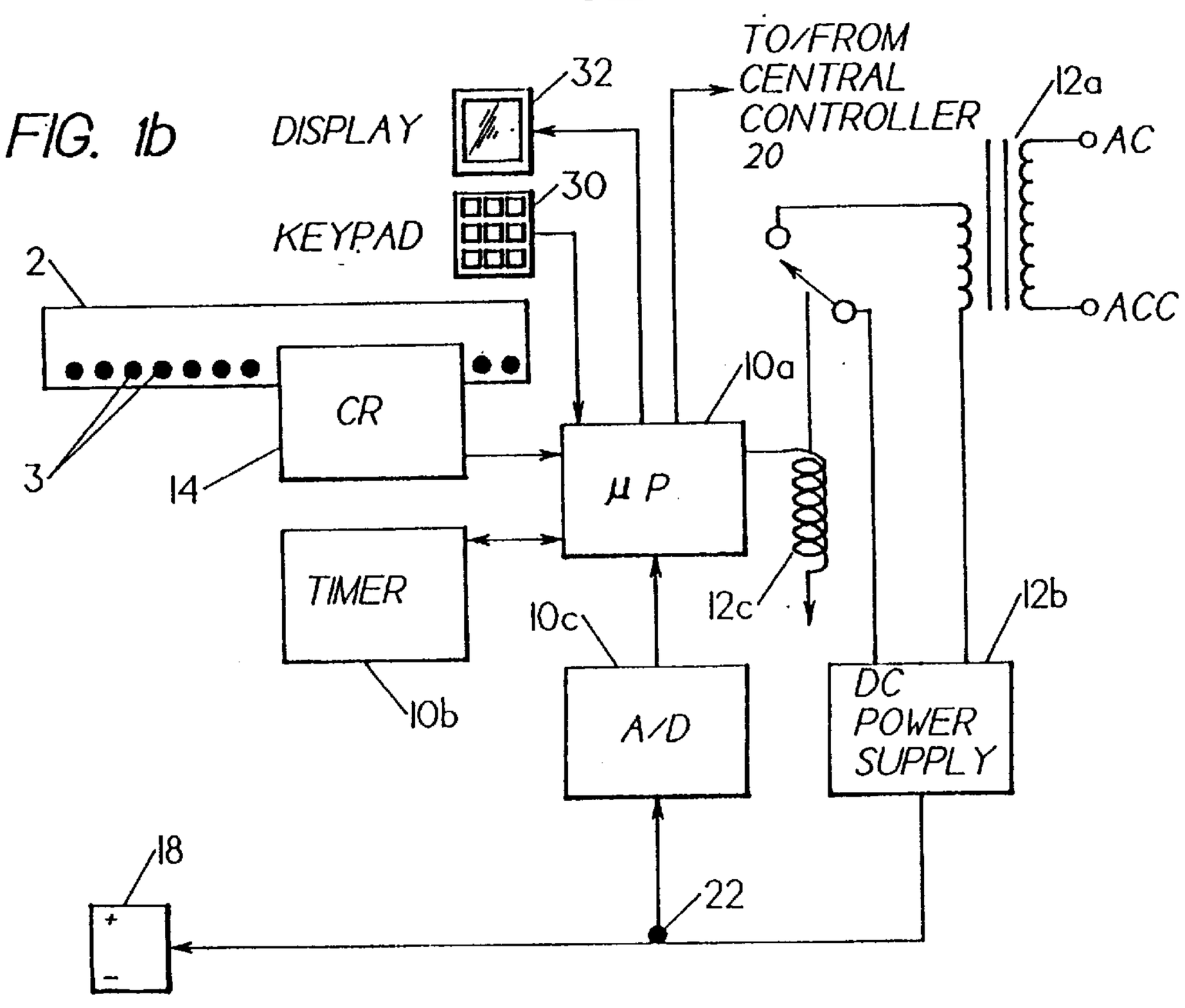

DISPLAY
32
KEYPAD
30
TO/FROM CENTRAL CONTROLLER 20
12a
AC
ACC
2
3
CR
14
10a
μP
TIMER
10b
10c
12c
12b
A/D
DC POWER SUPPLY
18
22
+
−

FIG. 2a

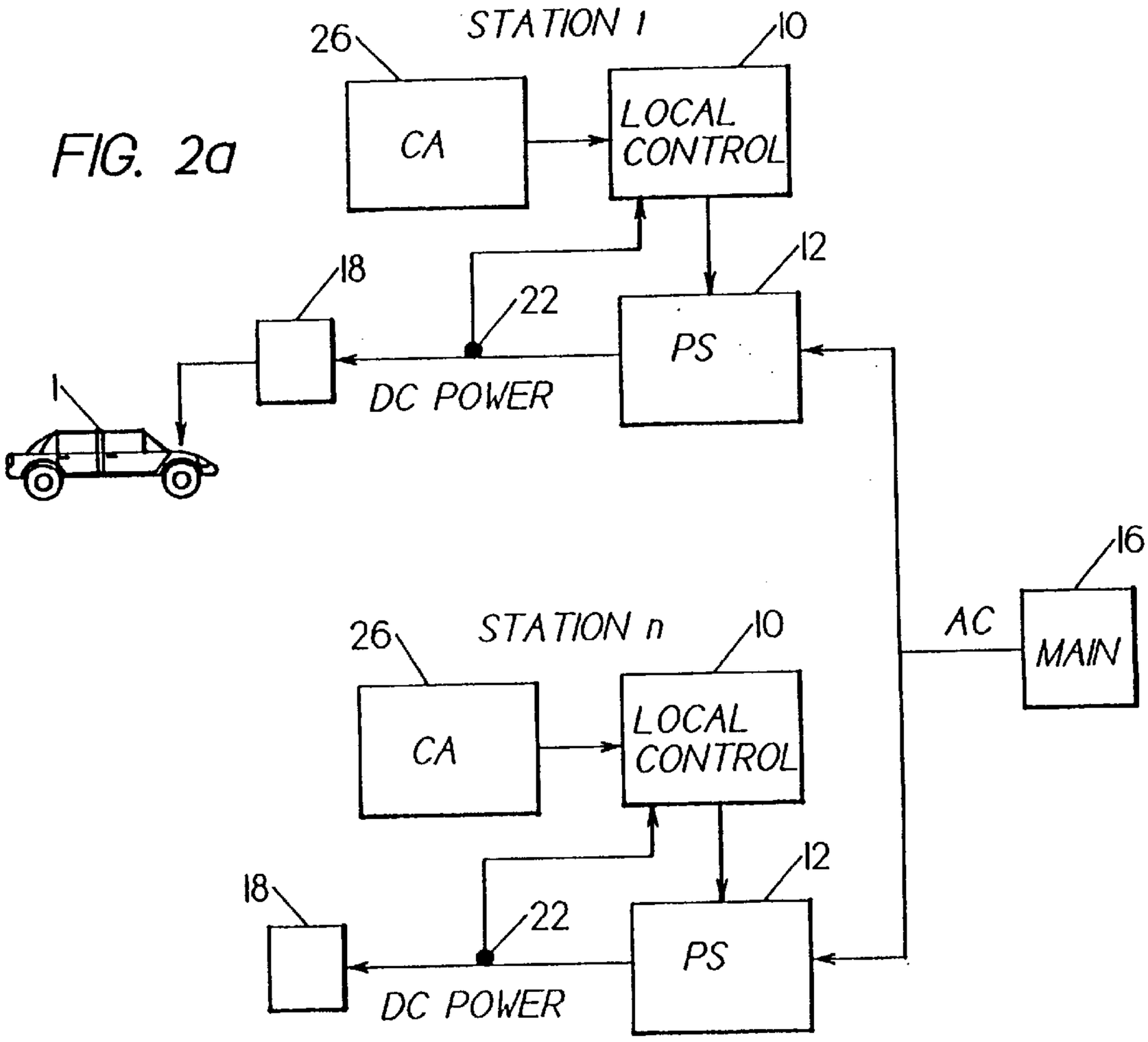

STATION 1
26
CA
10
LOCAL CONTROL
12
PS
18
22
DC POWER
1
16
AC
MAIN
STATION n
26
CA
10
LOCAL CONTROL
12
PS
18
22
DC POWER

FIG. 2b

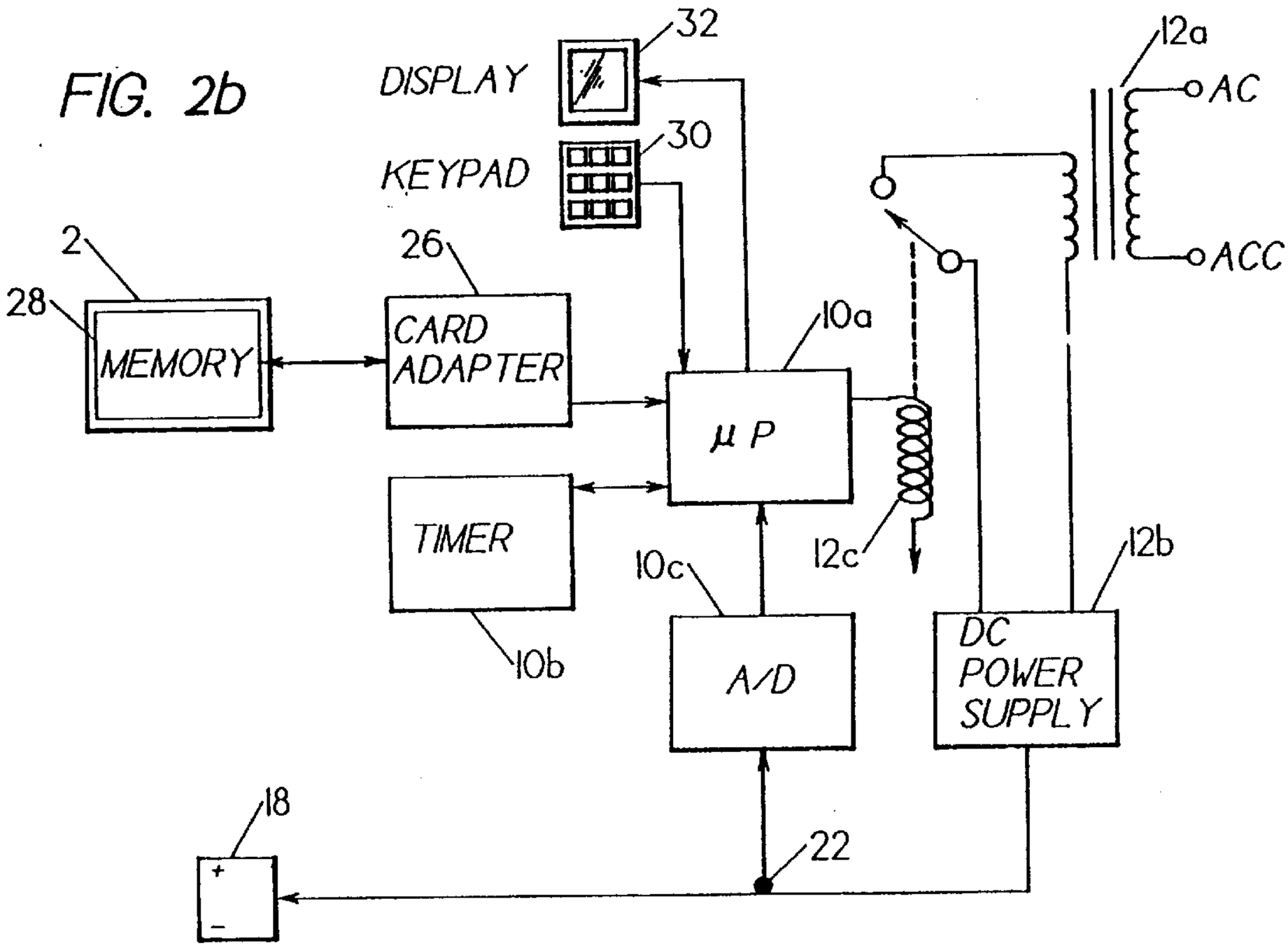

DISPLAY
32
KEYPAD
30
2
28
MEMORY
26
CARD ADAPTER
10a
μP
TIMER
10c
A/D
10b
12a
AC
ACC
12c
12b
DC POWER SUPPLY
18
22
+
−

FIG. 3

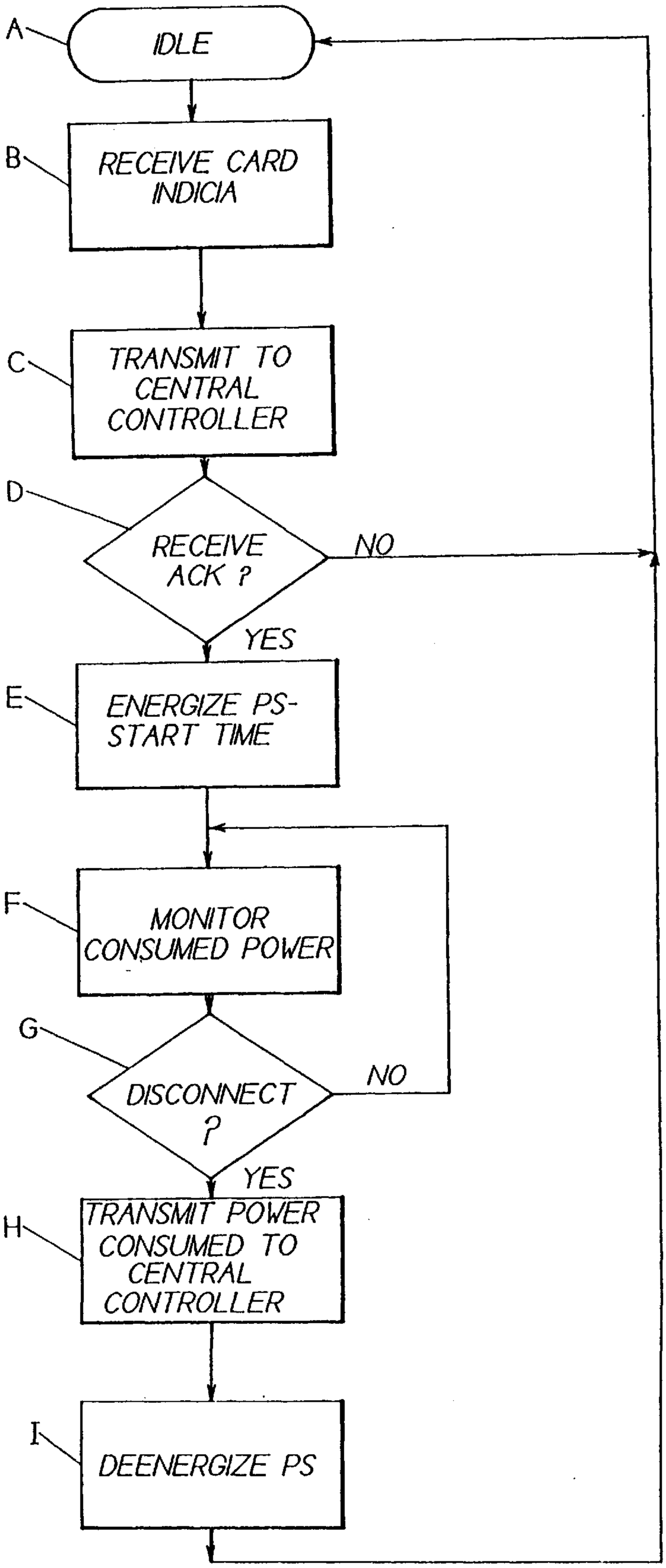

A
IDLE
B
RECEIVE CARD INDICIA
C
TRANSMIT TO CENTRAL CONTROLLER
D
RECEIVE ACK ?
NO
YES
E
ENERGIZE PS-START TIME
F
MONITOR CONSUMED POWER
G
DISCONNECT ?
NO
YES
H
TRANSMIT POWER CONSUMED TO CENTRAL CONTROLLER
I
DEENERGIZE PS

FIG. 4

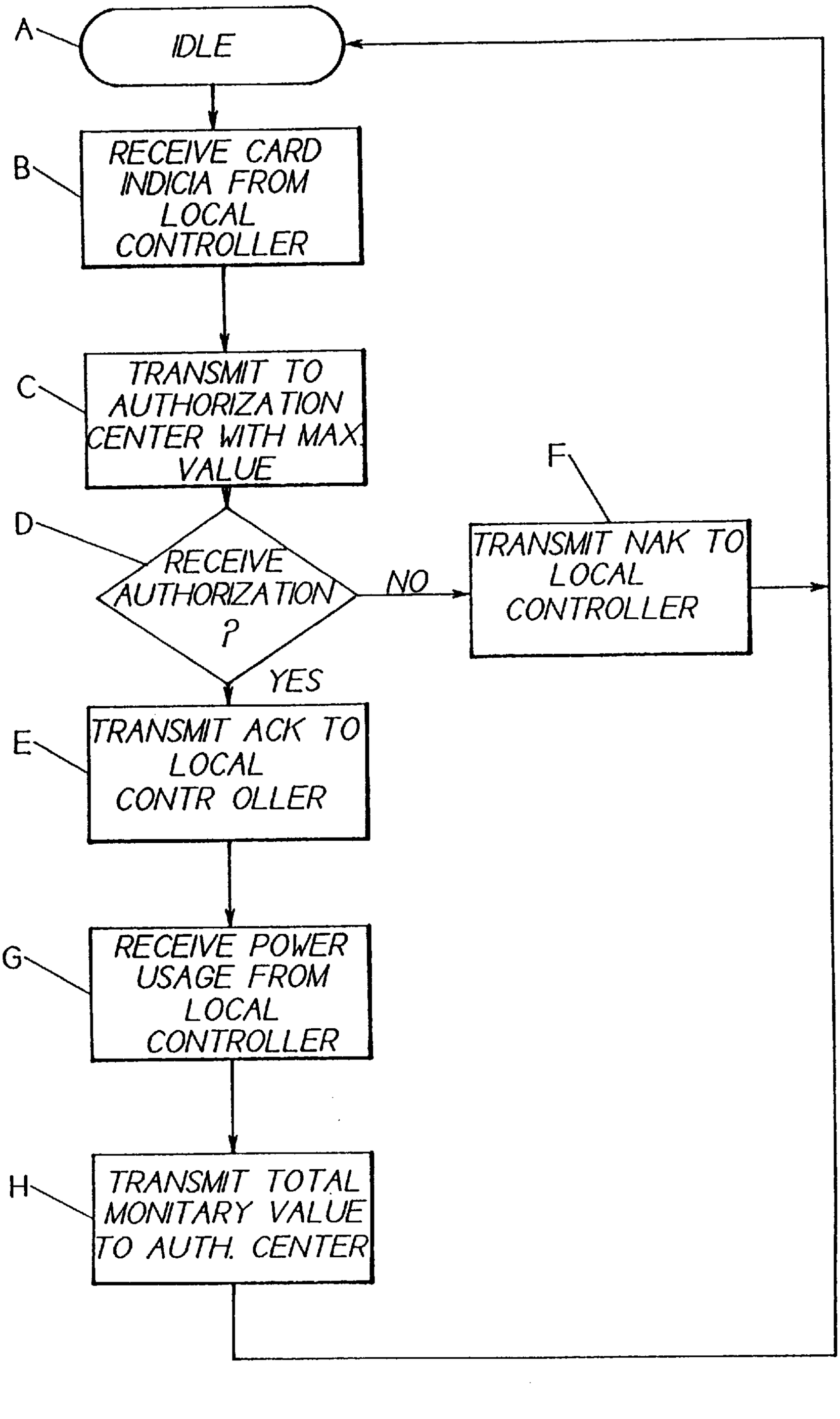

A
IDLE
B
RECEIVE CARD INDICIA FROM LOCAL CONTROLLER
C
TRANSMIT TO AUTHORIZATION CENTER WITH MAX. VALUE
D
RECEIVE AUTHORIZATION ?
NO
F
TRANSMIT NAK TO LOCAL CONTROLLER
YES
E
TRANSMIT ACK TO LOCAL CONTR OLLER
G
RECEIVE POWER USAGE FROM LOCAL CONTROLLER
H
TRANSMIT TOTAL MONITARY VALUE TO AUTH. CENTER

FIG. 5

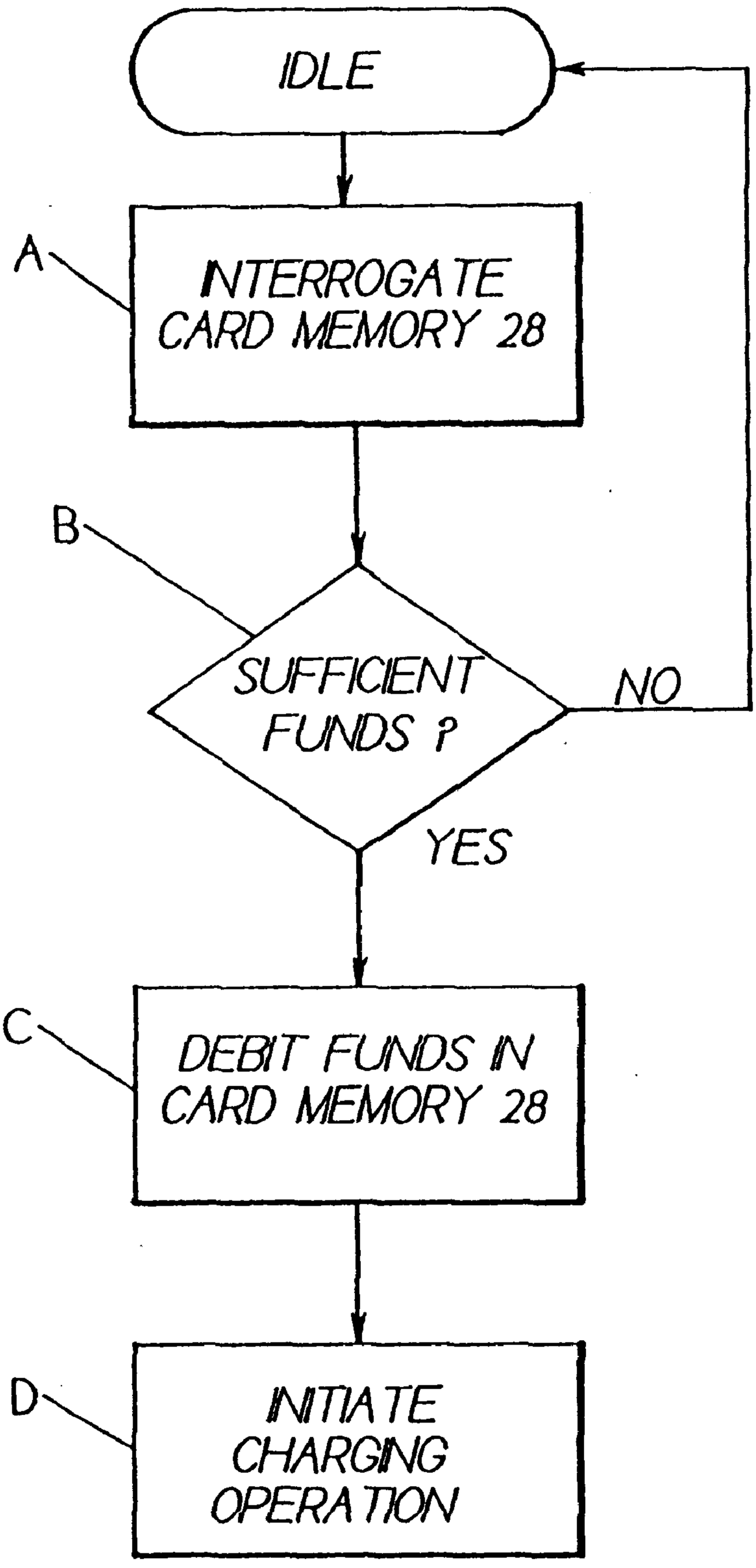

IDLE
A
INTERROGATE CARD MEMORY 28
B
SUFFICIENT FUNDS ?
NO
YES
C
DEBIT FUNDS IN CARD MEMORY 28
D
INITIATE CHARGING OPERATION

FIG. 6

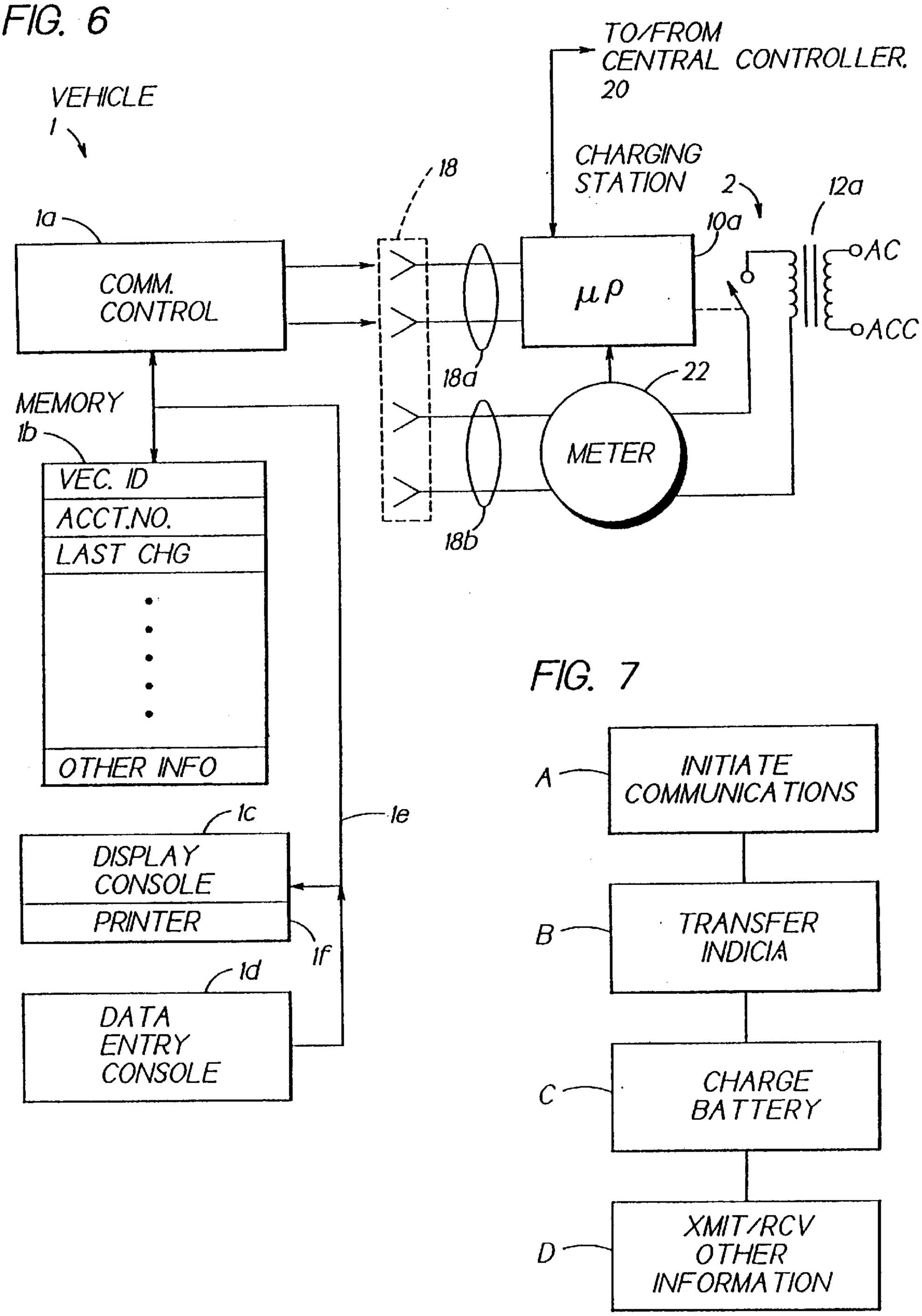

VEHICLE
1
1a
COMM. CONTROL
MEMORY
1b
VEC. ID
ACCT.NO.
LAST CHG
OTHER INFO
1c
DISPLAY CONSOLE
PRINTER
1d
DATA ENTRY CONSOLE
1e
1f
18
18a
18b
TO/FROM CENTRAL CONTROLLER.
20
CHARGING STATION
2
10a
μP
12a
AC
ACC
22
METER

FIG. 7

A
INITIATE COMMUNICATIONS
B
TRANSFER INDICIA
C
CHARGE BATTERY
D
XMIT/RCV OTHER INFORMATION

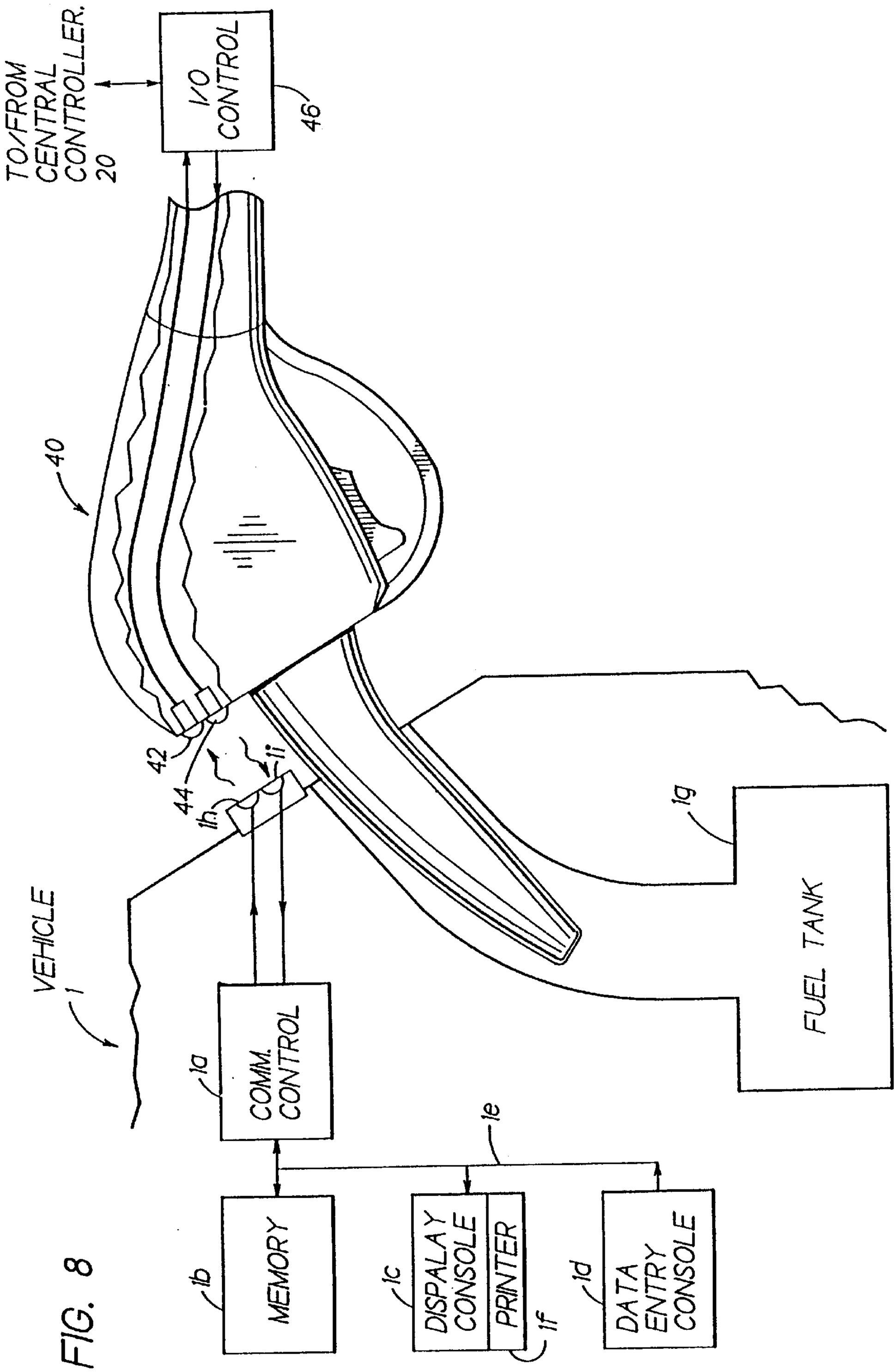

TO/FROM CENTRAL CONTROLLER 20
I/O CONTROL
46
40
42
44
1i
1h
VEHICLE
1
1a
COMM. CONTROL
1e
1g
FUEL TANK
1b
MEMORY
1c
DISPALAY CONSOLE
PRINTER
1f
1d
DATA ENTRY CONSOLE

FIG. 8

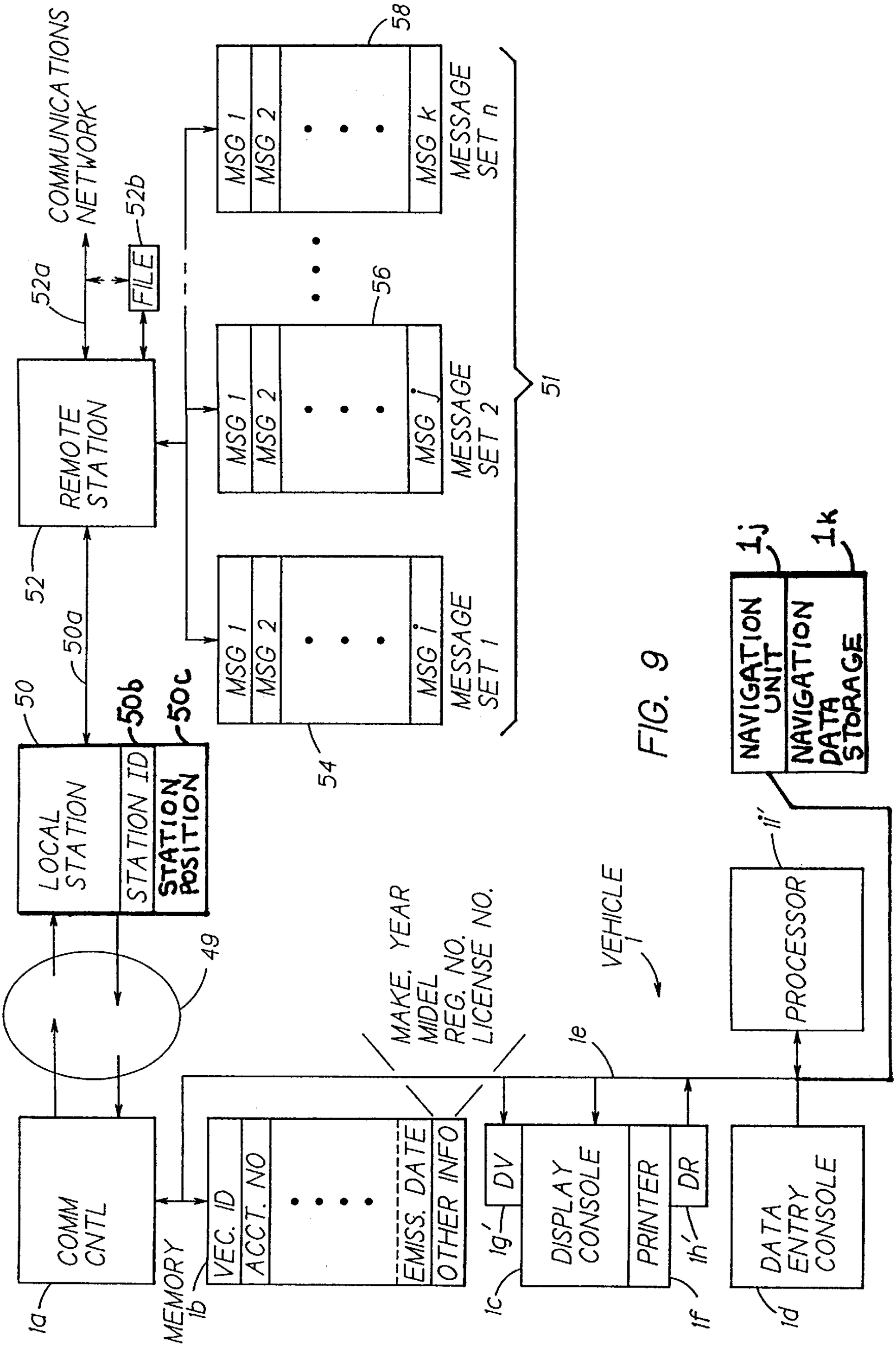

COMMUNICATIONS NETWORK
52b
FILE
52a
REMOTE STATION
52
50a
50
50b
50c
LOCAL STATION
STATION ID
STATION POSITION
49
58
MSG 1
MSG 2
MSG k
MESSAGE SET n
56
MSG 1
MSG 2
MSG j
MESSAGE SET 2
51
54
MSG 1
MSG 2
MSG i
MESSAGE SET 1
1j
1k
NAVIGATION UNIT
NAVIGATION DATA STORAGE
11'
PROCESSOR
MAKE, YEAR
MIDEL
REG. NO.
LICENSE NO.
1e
VEHICLE
1
COMM CNTL
1a
MEMORY
1b
VEC. ID
ACCT. NO
EMISS. DATE
OTHER INFO
1g'
DV
1c
DISPLAY CONSOLE
PRINTER
DR
1h'
1f
DATA ENTRY CONSOLE
1d

FIG. 9

METHODS AND APPARATUS FOR LOADING OR MODIFYING A VEHICLE DATABASE FROM A REMOTE COMPUTER VIA A COMMUNICATIONS NETWORK AND A FUEL OR CURRENT DISPENSER

CROSS-REFERENCE TO A RELATED PATENT APPLICATION

This U.S. patent application is a continuation of U.S. copending patent application Ser. No. 08/252,832, filed on Jun. 2, 1994, now U.S. Pat. No. 5,806,018 which in turn is a continuation-in-part of U.S. patent application Ser. No. 08/066,967, filed May 25, 1993, now U.S. Pat. No. 5,327,066, issued Jul. 5, 1994, the disclosures of which are incorporated by reference herein in their entireties.

FIELD OF THE INVENTION

This invention relates generally to methods and apparatus for updating navigation information in a vehicle while dispensing a consumable energy source to the vehicle.

BACKGROUND OF THE INVENTION

U.S. Pat. No. : 5,327,066 discloses methods and apparatus for transferring information between a vehicle, and a station during a battery recharging operation (for an electrically powered vehicle) and during a refueling operation (for a vehicle having an internal combustion engine). The transferred information can be accounting-related so as to properly charge for the dispensed electrical power or fuel. The transferred information may also represent messages, advertisements, inquiries and the like.

It has been realized that a vehicle having a navigation unit may require periodic navigation-information related updating so as to accommodate changes in the local navigation situation, such as road closures, detours, etc., and possibly also to recalibrate or reset the navigation unit for accumulated errors.

A number of presently available vehicle navigation systems use a multi-disk CD player and a display. CD-ROM disks having navigation data are accessed and read by the CD player. The CD player may also be used to play music for the stereo system of the vehicle. As used herein, the term "primary navigation data" is intended to mean the navigation data stored in the CD-ROM disk or other suitable storage medium which has information similar to a road map. Because the locations of roads do not change very often, the CD-ROM can be used, and the recorded information may remain valid, for a long period of time. However, although the locations of roads do not often change, other navigation or locational information does change, such as temporary road or lane closures for repairs, fees for tolls, locations of restaurants, motels, retail facilities, etc.

A need thus exists for a low cost and simple mechanism to provide navigation data that supplements the primary navigation data that is stored within the vehicle.

Also, for some vehicular navigation systems it may be desirable to periodically update an assumed present position of the vehicle so as to compensate and eliminate erroneous navigation information. The recalibration could be accomplished through the use of a positioning system, such as one based on the constellation of Global Positioning Satellites (GPS). However, this approach would require providing the vehicle with a suitable receiver for receiving and processing the GPS information. This approach would thus increase the complexity and cost of the vehicle.

Thus, a need also exists for a low cost and simple mechanism to input very accurate position information into a navigation system of a vehicle, such as an automobile.

OBJECTS OF THE INVENTION

It is one object of this invention to provide a low cost and simple mechanism to input navigation-related information into a navigation system of a vehicle.

It is a further object of this invention to provide a vehicle battery charging system that also enables the inputting of navigation-related information into a navigation system of the vehicle.

It is another object of this invention to provide a vehicle refueling system that also enables the inputting of navigation-related information into a navigation system of the vehicle.

SUMMARY OF THE INVENTION

The foregoing and other problems are overcome and the objects of the invention are realized by methods and apparatus for inputting navigation-related information to a vehicle while the vehicle is coupled to a local station, such as a recharging station or a refueling station.

More particularly, this invention relates to updating primary navigation data or supplementing primary navigation data in a vehicle navigation system.

In a first aspect this invention provides supplementary navigation data to be used with a vehicular navigation system. The supplementary navigation data can be superimposed over the primary navigation data on the navigation system display or, can be presented as a split-screen display. The supplementary navigation data may contain information such as locations of local facilities, local road information, types of local facilities. "Local facilities" is intended to means police stations, hospitals, motels, hotels, restaurants, retail stores, vehicles repair shops, recreational locations, movie theaters, parks, etc. "Local road information" is intended to mean road construction, alternate routes, toll fees, traffic conditions, etc.

The supplementary navigation data is received by the vehicle when the vehicle is coupled to a station, such as a battery recharging station or a refueling station, and is transmitted to the navigation system. An on-board controller can store the data and/or display the data. The navigation system could use the supplementary data to determine routes or locations for specific local facilities selected by the user. In an interactive or two-way communications system, the user can select predetermined types of supplementary data to be received. The supplementary navigation data is preferably transmitted to the navigation system at a local vehicle station, such as a refueling station, a vehicle rest stop, a vehicle tourist center, etc. The supplementary data could also include information specific to local facilities such as phone number, prices, specials or discounts, etc. The display of the supplementary data is preferably selectively actuated by the user. However, specific types of data, such as road closures, could be automatically displayed by the controller.

BRIEF DESCRIPTION OF THE DRAWING

The foregoing and other features of the invention are made more apparent in the ensuing Detailed Description of the Invention, when read in conjunction with the attached Drawings, wherein:

FIG. **1***a* is a block diagram illustrating the use of a plurality of battery charging stations, wherein indicia

received from a consumer-provided card is transmitted to a central controlling station;

FIG. **1***b* is a block diagram illustrating in greater detail one of the charging stations of FIG. **1***b;*

FIG. **2***a* is a block diagram showing an embodiment wherein a battery changing station debits a monetary balance stored within a consumer-provided card;

FIG. **2***b* is a block diagram illustrating in greater detail the battery charging station of FIG. **2***a;*

FIG. **3** is a flow chart illustrating the operation of one of the battery charging stations of FIGS. **1***a* and **1***b;*

FIG. **4** is a flowchart illustrating the operation of the central controlling station of FIG. **1***a;*

FIG. **5** is a flowchart illustrating the operation of the battery charging station of FIG. **2***b;*

FIG. **6** is a block diagram illustrating a battery charging station and a vehicle, wherein information is transferred between the vehicle and the battery charging station;

FIG. **7** is a flowchart illustrating the operation of the battery charging station and vehicle of FIG. **6**;

FIG. **8** is a block diagram illustrating a fueling station and a vehicle, wherein information is transferred between the vehicle and the fueling station; and

FIG. **9** is a block diagram of an embodiment of the invention wherein navigation information is input to the vehicle.

DETAILED DESCRIPTION OF THE INVENTION

Before describing this invention in detail a review is first made, with reference to FIGS. **1***a*–**8**, of the invention described in the above-referenced U.S. copending and patent application Ser. No. 08/066,967, filed May 25, 1993 by Harry F. Smith, now U.S. Pat. No. 5,327,066 the disclosure of which has been incorporated herein in its entirety.

Referring to FIGS. **1***a*, **1***b*, **3** and **4** there is shown a plurality of battery charging stations, designated STATION **1** to STATION n, each of which includes a local controller **10**, a power supply **12**, and a card reader **14**. Each power supply **12** receives an AC power input from a main **16**. The power supply **12** includes a transformer **12***a* and a DC power supply **12***b*. The output of power supply **12** has a voltage potential suitable for recharging a battery within a vehicle **1**. A suitable connector **18** is provided for coupling to the battery terminals of the vehicle **1**.

The local controller **10** includes a microprocessor **10***a*, a timer **10***b*, and an analog-to-digital (A/D) converter **10***c*. Microprocessor **10***a* receives an input from the card reader **14**, an input from the timer **10***b*, and an input from the A/D converter **10***c*. The microprocessor **10***a* provides an output to a switching device, such as a relay **12***c*, that is employed to open and close the transformer **12***a* circuit. During use, a consumer inserts a card **2** having indicia **3** on a surface thereof. The indicia may be recorded upon a magnetic stripe, a bar code, a series of punched-out openings, or any suitable medium for conveying the user's account number and possibly other information. The card reader **14** senses the indicia **3** and provides an output to the microprocessor **10***a*, the output being expressive of the information conveyed by the indicia **3**. The microprocessor **10***a* is bidirectionally coupled to a central controller **20** for transmitting the indicia information thereto.

Referring to FIG. **3**, in response to the receipt of the digital signal from the card reader **14** the microprocessor **10***a* exits an IDLE state (A) and receives the digital signal (B). At block C the microprocessor transmits a digital signal to the central controller **20**, the digital signal being expressive of information conveyed by the indicia **3**.

Referring to FIG. **4**, in response to the transmission of the indicia information from the microprocessor **10***a* the central controller **20** exits an idle state (Block A) and receives the card indicia information from the microprocessor **10***a* (Block B). The central controller **20** transmits the indicia information to a remote authorization center. The central controller **20** may also transmit a maximum monetary value that the consumer will be expected to expend (Block C). The central controller **20** then waits to receive an authorization from the authorization center. If the authorization is received (Block D) the central controller **20** transmits an acknowledge (ACK) signal to the microprocessor **10***a* of the charging station (Block E). If the authorization is not received the central controller transmits a no acknowledge (NAK) signal to the local controller (Block F) and re-enters the idle state (A).

Returning to the flow chart of FIG. **3**, the local controller **10** waits to receive the ACK (Block D) from the central controller **20**. If the NAK signal is received instead the local controller **10** re-enters the idle state at Block A and no power is dispensed to the consumer. If the ACK signal is received the microprocessor **10***a* closes relay **12***c* so as to energize the DC power supply **12***b* (Block E). The microprocessor **10***a* also initiates timer **10***b* so as to record an amount of time that the power supply **12***b* is energized. The microprocessor **10***a* then monitors the power utilized by the consumer. To this end a suitable means is connected to the output of the power supply **12** so as to monitor the current flow from the DC power supply **12***b*. For example, an inductive pickup **22** may be provided adjacent the power leads, the output of the pickup **22** being indicative of the power flowing through the power leads. A low value resistance may also be inserted in series with a power lead and the voltage potential appearing across the resistance may be measured to obtain an indication of the charging current. It is also within the scope of the invention to instead meter the AC power at the input to the DC power supply **12***b*. The DC power supply **12***b* may be embodied within a linear power supply, a switching power supply, or any suitable AC/DC conversion apparatus. If a switching supply is used, the transformer **12***a* may be eliminated and the switching supply connected directly to the AC power input through a switch controlled by the microprocessor **10***a*.

For any of these various embodiments an analog signal indicative of the power consumed in recharging the vehicle's battery is converted, by the A/D converter **10***c*, to a digital reading that is input to the microprocessor **10***a*. It should be realized that AC power may be dispensed and metered, instead of DC power, if the vehicle is equipped with a suitable AC/DC converter.

As shown in FIG. **3**, in addition to monitoring the power usage of Block F, the microprocessor **10***a* operates at Block G to sense a disconnect condition wherein the vehicle battery is disconnected from the connector **18**. This can be sensed, by example, by the current going to zero or the voltage rising to an open circuit value. So long as the disconnect is not sensed at Block G the microprocessor **10***a* continues to monitor the power usage at block F. When the disconnect is sensed at block G the microprocessor **10***a* transmits a signal to the controller **20**, the signal indicating a total amount of power consumed (Block H). The microprocessor **10***a* then de-energizes the D/C power supply **12***b* by opening relay **12***c* (Block I) and reenters the idle state (Block A).

Referring again to FIG. **4**, the central controller **20** receives, at Block G, the power usage signal from the microprocessor **10***a* of the local controller **10**. Responsive thereto the central controller **20** transmits to the authorization or accounting center a signal indicative of a total monetary value that is to be charged to the consumer's account (Block H). Other charges may also be incurred in addition to the charge for the dispensed power. By example only, a usage fee or a parking fee may be added. The central controller **20** then reenters the idle state at Block A.

The timer **10***b* serves a dual function. The output of the timer **10***b* enables the microprocessor **10***a* to determine the total Watt-hours of electrical power that are consumed in charging the vehicle's battery. The timer **10***b* also indicates the amount of time that the vehicle **1** is connected to the charging station. For some applications it may be desirable to also bill the consumer for the amount of time that the vehicle **1** is connected. This may be especially advantageous when the vehicle **1** is connected for a significant period of time beyond what is required to fully charge the battery. For example, if the charging station is located in an airport parking lot the vehicle **1** may be connected for several days or even weeks to the charger, even though during a significant portion of this time only a trickle charge is being applied to the vehicle's battery. For this case, it may be advantageous to also bill the consumer for "connect time", that is, to bill the consumer at an hourly or daily rate, regardless of the amount of power actually being consumed.

The card **2** presented by the consumer may be a conventional credit card. The card **2** may also be an Automatic Teller Machine (ATM) card, in which case the billed amount may be debited from a corresponding bank account maintained by the consumer. Also, the card **2** presented by the consumer may be a card especially issued to the consumer solely for the purpose of recharging the battery within the consumer's vehicle. That is, an electric utility may issue the card and the recorded charges may appear on the consumer's monthly statement. Alternatively, an organization that installs and maintains the charging stations may issue the card to the consumer, and subsequently bill the consumer for consumed power.

As employed herein an indicia representative of a monetary value is intended to encompass information recorded upon a substrate, such as a credit card; a bank account number recorded upon an ATM card; data stored within a memory device of a credit card or a memory device of the vehicle itself; an account number or an authorization number directly input by a consumer via a data entry device, such as a keypad or the like; and any other information that enables an account associated with a consumer to be charged or debited.

Referring now to FIGS. **2***a* and **2***b* there is illustrated a further embodiment, wherein components found also FIGS. **1***a* and **1***b* are numbered accordingly. In this embodiment each of the plurality of charging stations includes a card adapter **26**. For this embodiment the local controller **10** is not required to be coupled to a central controller **20** or to an authorization center, in that the local controller **10** directly debits a monetary value stored within a memory **28** that is contained within the consumer's card **2**. This embodiment is suited for use in, but not limited to, an application wherein a predetermined amount of power is provided to the consumer. That is, the local controller **10** initially debits the consumer's card by some predetermined monetary value, prior to dispensing power. When the microprocessor **10***a* determines that the billed amount of power has been consumed, the microprocessor **10***a* deactivates the DC power supply.

In operation, and referring to FIG. **5**, the microprocessor **10***a* interrogates the card memory **28** (Block A) to determine if the stored balance is at least equal to the amount to be debited (Block B). If this condition is satisfied, the microprocessor **10***a* debits the memory by the required monetary value (Block C) and initiates the charging operation (Block D). Pre-billing the consumer is desirable in that the consumer may purposely or inadvertently disconnect the charging station from the vehicle's battery, without also inserting the card into the card adapter **26**.

It is within the scope of this teaching to consolidate the functionality of the plurality of local controllers **10**, in particular the microprocessors **10***a*, into the central controller **20**. For this embodiment each STATION includes a card interface device, such as the card reader **14** or card adapter **26**, and also, preferably, the power supply **12**. The central controller **20** is responsible for receiving input from the various card interfaces and for remotely activating the associated DC power supplies **12** to dispense power. For installations spread over a considerable distance the DC power supply **12** is preferably provided within each local STATION so as to reduce voltage drops between a centrally located power supply and the battery terminals. However, for small installations comprising a few stations in close proximity, wherein the DC voltage drops are not excessive, the central controller **20** may also include one or more of the DC power supplies. In one still further embodiment of the invention the central controller may be eliminated altogether, with each local controller communicating directly with the credit card authorization center, or operating autonomously to debit the consumer's balance within the card memory. Another embodiment includes one or more card interface devices in association with the central controller **20**, and not the local controller **10**.

A still further embodiment provides a data entry device, such as a keypad **30** (FIG. **1***b*), at each local STATION or at the central controller **20** whereby a consumer is enabled to enter a personal or an organizational account code against which a monetary charge is to be made. The data entry device may also be employed to enter other information, such as a type of battery that is installed within the vehicle so that, by example, the voltage level or the battery charging rate may be set by the local or the central controller. A data output device, such as an LCD display **32** (FIG. **1***b*), may also be employed for communicating information to the consumer, such as instructions or an indication of the amount of money to be charged to the consumer.

In a still further embodiment, and referring to FIGS. **6** and **7**, a battery charging station and a vehicle are provided wherein information is transferred between the vehicle and the battery charging station.

In this embodiment the connector **18** includes a data communications portion **18***a* and a power dispensing portion **18***b*. AC power is dispensed from the transformer **12***a*, and a meter **22** provides an indication of the dispensed power to the microprocessor **10***a*. The data communications portion **18***a* of the connector **18** is coupled to the microprocessor **10***a*. The vehicle **1** includes a communication controller **1***a* that is coupled to the microprocessor **10***a* through the data communications portion **18***a* of the connector **18**. The vehicle **1** also includes a memory **1***b* that stores user-specific information. The user specific information includes a vehicle identification (VEC. I.D.) and, for example, an account number (ACCT. NO.). The memory **1***b* may also store other information, such as information relating to a last charging operation (LAST CHG), with which the communications controller **1***a* is enabled, in conjunction with an

odometer reading and the current charging information, to monitor the energy efficiency of the vehicle **1**. To this end the vehicle may also include a display console **1***c*, such as an LCD display or a video monitor, which is used to display the energy usage and efficiency to the user. The vehicle may also include a data entry console **1***d*. A bus **1***e* couples together the communications controller **1***a*, memory **1***b*, display console **1***c* and data entry console **1***d*. The data entry console **1***d* can be employed by the user to initiate a transfer of information from the vehicle **1** to the CHARGING STATION **2**, such as a transfer of the ACCT. NO. Alternately, this transfer can be accomplished automatically by the communications controller **1***a* in concert with the microprocessor **10***a*.

Referring to FIG. **7**, at Block A the user connects the vehicle **1** to the CHARGING STATION **2**. Responsive to the connection, communications are initiated by the microprocessor **10***a* by interrogating the communications controller **1***a* for the ACCT. NO. information stored in the memory **1***b*. The VEC. I.D., and also optional other information, may be transferred from the vehicle **1** to the CHARGING STATION **2** via the data communications portion **18***a* of the connector **18** (Block B). In response to the received indicia, the microprocessor **10***a* communicates with the central controller **20** to verify the ACCT. NO. Assuming that the ACCT. NO. is verified, the microprocessor **10***a* activates the transformer **12***a*, the battery of the vehicle **1** is charged, and the meter **22** is read to obtain an indication of the dispensed power (Block C). An accounting is then made in cooperation with the previously received indicia.

At the completion of the charging cycle, the communications controller **1***a* is enabled to determine the energy efficiency of the vehicle, based on information received from the microprocessor **10***a* and internal odometer readings. In this manner the communications controller **1***a* is enabled to detect abnormal battery or vehicle conditions. Any pertinent information can be displayed to the user through the use of the display console **1***c*. The communications controller **1***a* then updates the LAST CHG information stored within the memory **1***b*. At Block D, an optional step of transferring other information is executed, it being realized that Block D may be executed prior to the completion of the battery charging operation.

The execution of Block D enables a number of valuable operations to be performed. One operation enables the central controller **20** to transmit unsolicited or solicited advertisements to the vehicle **1** for display on the display console **1***c*. By example, the names of lodgings, restaurants, and/or recreational areas within a predetermined radius of the charging station **10** can be displayed to the user. In response, the user can employ the data entry console **1***d* to make further inquiries as to location, rates, etc. Further by example, using predetermined keystrokes the user can reserve a room at a selected lodging, and can initiate a transfer of the stored ACCT. NO., or another account number, to be relayed to the selected lodging via the microprocessor **10***a* and the central controller **20**. A confirmation number may then be relayed from the selected lodging, via the central controller **20**, to the vehicle **1** for display on the display console **1***c*. An optional printer device **1***f* can also be employed to provide a hard copy of the confirmation number, and/or to provide a copy of addresses, rates, billing information, etc. The optional printer device **1***f* may also be employed to provide the user with discount coupons, advertising literature, the location of and distance to other charging stations, etc.

Another operation that is enabled by the execution of Block D is the transmission and/or reception of other information in the form of messages. For example, a party wishing to contact an occupant of the vehicle **1** transfers a message to the central controller **20**, the message including the VEC. I.D., the ACCT. NO., or some other identifying information.

The message and identifying information is stored within the central controller **20**. The other identifying information can include, by example, the vehicle's license plate number, the name of the driver, a telephone number, or the name of a passenger. In this regard, the vehicle operator can manually enter other identifying information into the memory **1***b* with the data entry console **1***d*. By example, before beginning a journey the operator can enter the names of any passengers into the memory **1***b*.

In response to receiving the message, the central controller **20** monitors incoming communications from charging stations **20** to identify a transmission from the vehicle to which the stored message is directed. When operating in this mode the communications controller **1***a* transfers all identification-related information from the memory **1***b* to the central controller **20**, via the microprocessor **10***a*. When the central controller **20** identifies a transmission from the vehicle having the stored message, the central controller transfers the stored message to the vehicle **1** for display and optional printing. An acknowledgement signal may be automatically or manually generated within the vehicle for transmission back to the central controller **20**.

If the central controller **20** determines that a last charging operation was accomplished at a charging station within a predetermined distance from a periphery of an area served by the central controller **20**, the central controller may **20** may relay the stored message to another central controller within an adjacent area. In this manner the message can be relayed to one or more additional central controllers for eventual delivery to the vehicle **1**. In like manner an acknowledgement signal can be relayed back to the originating central controller.

Initiating a message within the vehicle **1** is accomplished by the operator employing the data entry console **1***d* to enter a message and an address of the message destination, such as telephone number or the identification of another vehicle. The message and identifying information are temporarily stored in the memory **1***b*. During a next charging operation the stored message information is relayed from the communications controller **1***a*, via the microprocessor **10***a*, to the central controller **20** for delivery. If delivery is accomplished during the charging operation, then an acknowledgment signal may be transferred immediately back to the vehicle **1** for display to the operator. If message delivery is delayed, then the acknowledgment signal is stored within the central controller **20** for delivery to the vehicle **1** during a next charging operation at another charging station.

FIG. **8** illustrates a fueling station for a vehicle **1** having an internal combustion engine and a fuel tank **1***g*. In this embodiment the direct electrical connection provided by the data communications portion **18***a* of connector **18** is eliminated, and replaced with an optical, infrared (IR) radiation data link. To this end a fuel nozzle **40** includes an IR receiver **42** and an IR transmitter **44** that provide bidirectional data communications with corresponding IR transmitter **1***h* and IR receiver **1***i*. IR transmitter and receiver **1***h* and **1***i* are positioned on the vehicle **1**, with respect to the normal position of the nozzle **40** during a fueling operation, so as to enable bidirectional bit serial data communications between communications controller **1***a*and an I/O controller **46** located at, or near to, the fuel pump. I/O controller **46** is

in bidirectional communication with the central controller **20**, as in the embodiment of FIG. **6**.

The vehicle **1** includes the memory **1***b*, display console **1***c*, data entry console **1***d*, bus **1***e*, and optional printer **1***f*, and operates as described above with respect to the flow chart of FIG. **7**, with modifications being made for dispensing a liquid fuel instead of electrical power. That is, account number information is automatically transferred between the vehicle **1** and the remote controller **20** during a fueling operation. The fueling station also transmits an amount of liquid fuel that is provided to the fuel tank **1***g*. Other information can also be transferred, such as advertisements, lodging information, confirmations, and messages to or from an occupant of the vehicle.

It can be realized that the interconnection between the vehicle **1** and the CHARGING STATION **2** may be provided in a number of suitable embodiments, including a low power RF link and an inductive transmitter and receiver. The use of a wireless connection, as opposed to a direct electrical connection, is preferred in the embodiment of FIG. **8** to avoid a possibility of generating a spark during the coupling and uncoupling of the nozzle **40**, and also to accommodate the various positions that the nozzle **40** may assume during the fueling operation.

Reference is now made to FIG. **9** for illustrating a further embodiment of this invention. Components that function as in FIG. **6** are numbered accordingly. In this embodiment the vehicle **1** is bidirectionally coupled at **49** to a local station **50** (e.g., battery recharging station, refueling station, etc.) which, in turn, may be bidirectionally coupled to a remote station **52**. The nature of the coupling at **49** may a direct electrical connection, or by a wireless technique such as optical, RF, magnetic, induction, or the like.

In this embodiment of the invention the information that is transmitted through the coupler **49** includes information that relates to updating primary navigation data or supplementing primary navigation data in a navigation unit **1***j* of the vehicle **1**. The navigation unit **1***j* includes a navigation data storage unit **1***k*, such as a CD ROM or a semiconductor memory device, wherein primary navigation data is stored.

In the illustrated embodiment a navigation data base **51** is comprised of a Message_Set_**1 54**, a Message_Set_**2 56**, up to a Message Set_n **58**. Message_Set_**1 54** is comprised of MSG_**1** to MSG_i, Message_Set_**2 56** is comprised of MSG_**1** to MSG_j, and Message_Set_n **58** is comprised of MSG_**1** to MSG_k. By example, a given one of the messages may be a message relating to a lane closure or lane restriction on a nearby highway. Also by example, the messages of Message_Set_**1 54** are messages that are predetermined to be of potential interest to many or all users of the local station **50**, while the messages of Message_Set_**2** are messages that are predetermined to be of potential interest to a first class of users of the local station **50**, and the messages of Message_Set_n are messages that are predetermined to be of potential interest to another class of users of the local station **50**.

In accordance with an aspect of this invention, selection between message sets **54–58**, and possibly also between messages of a given message set, may be made by the remote station **52** in accordance with information that is transferred from the vehicle **1**, through the local station **50**, during a time that the vehicle is bidirectionally coupled to the local station **50**. The transferred information selectively identifies one, some, or all of: (a) a characteristic of an occupant of the vehicle (e.g., name, account number, address, etc.); (b) a characteristic of the vehicle (e.g., make, model, year, class, registration number, marker number, odometer reading, owner, etc.); (c) a destination of the vehicle (entered through the data entry console **1***d* and optionally stored within the memory **1***b*); and (d) any other characteristic of interest.

By example, the Other Information that is stored within the memory **1***b* can include the make, year and model number of the vehicle **1**, the registration number, and possibly the license or marker number. A large variety of Other Information can be provided, either as "fixed information" (for example, information stored into the memory **1***b* by the automobile manufacturer or dealer), or "variable information" (for example, information stored into the memory **1***b* by the owner and/or operator of the vehicle through, for example, the data entry console **1***d*). The owner and/or user supplied information can include, by example only, a destination for the vehicle, or a specific inquiry for the data base **51** (for example, list all motels within a 20 mile radius of the local station **50**).

In response to the information that is transferred from the vehicle **1**, the remote station **52** is enable to select one or more messages from one or more of the message sets. The selected message or messages are then transferred from the remote station **52** to the local station **50**. The message or messages can be displayed at the local station **50**, or can be inputted to the vehicle for storage, display and possible printing.

In accordance with this embodiment of the invention the information that is received by the vehicle **1** through the coupler **49** is supplementary navigation information that is routed to the navigation unit **1***j* to supplement or override the pre-stored navigation data in the unit **1***k*.

The supplementary navigation data that is received by the vehicle **1** can be superimposed over the primary navigation data on the navigation system display (**1***c*) or, can be presented as a split-screen display. The supplementary navigation data may contain information such as locations of local facilities, local road information, types of local facilities. "Local facilities" is intended to means police stations, hospitals, motels, hotels, restaurants, retail stores, vehicles repair shops, recreational locations, movie theaters, parks, etc. "Local road information" is intended to mean road construction, alternate routes, toll fees, traffic conditions, etc.

The supplementary navigation data is received by the vehicle **1** when the vehicle is coupled to the station **50**, such as a battery recharging or a refueling station, and is transmitted to the navigation system. The on-board navigation controller (**1***j*) can store the data and/or display the data. The navigation system may use the supplementary data to determine routes or locations for specific local facilities selected by the user. In an interactive or two-way communications system, the user can select predetermined types of supplementary data to be received. The supplementary navigation data is preferably transmitted to the navigation system at a local vehicle station, such as a refueling station, a vehicle rest stop, a vehicle tourist center, etc. The supplementary data could also include information specific to local facilities such as phone number, prices, specials or discounts, etc. The display of the supplementary data is preferably selectively actuated by the user. However, specific types of data, such as road closures, could be automatically displayed by the controller.

In another embodiment of this invention the information that is received by the vehicle **1** through the coupler **49** is a position (for example latitude and longitude, and possibly

also elevation) of the local station **50**, as stored within a station position unit **50***c*. This positional navigation information is routed to the navigation unit **1***j* to update an internally maintained estimated position of the vehicle **1**, thereby resetting and calibrating the internally maintained position for accumulated errors.

Further by example, the messages of Message_Set_**1 54** may be messages that are of interest to all users of the local station **50**, for example local weather reports, local road conditions, local traffic conditions, etc. The messages of Message_Set_**2 56** may be messages that are determined to be of greatest potential interest to occupants of vehicles that intend to travel in a first direction or on a particular highway. The messages of Message_Set_n **58** may be messages that are determined to be of greatest potential interest to occupants of vehicles that intend to travel in a second direction or on another highway.

In another or same embodiment of this invention the registration information or the marker information that is stored within the memory **1***b* of the vehicle **1** can be used to distinguish "local" vehicles from all other vehicles. In this regard a "local" vehicle may be one that is registered or garaged within some predetermined distance of the local station **50**, or within some predetermined geographical region (county, state, town, etc.). For this embodiment at least one first message set is directed to vehicles identified to be local vehicles, while at least one second message set is directed to all other vehicles. Of course, o other types of vehicle types, such as commercial trucks, could also have their own types of messages.

It can be appreciated that some of the message types that are delivered to a local station **50** that is located along an interstate highway may differ significantly from some of the message types delivered to a local station **50** that is located within a large urban area. In like manner, some of the message types provided within a recreational or tourist area may differ significantly from some of the message types delivered within an agricultural area or an industrial area.

The remote station **52** can be provided with a communications link **52***a* for inputting navigation data to the vehicle **1** from a remote source of such data, and for outputting messages from the vehicle **1** to a remote receiver of messages. As but one example, the remote source of messages may be the state highway authority, which may provide a schedule of expected construction-related road closures for the next seven days. This information is stored within the vehicle **1**, and can then be used by the navigation unit **1***j* over the seven day period to supplement the navigation data stored within the navigation data storage **1***k*. This embodiment assumes that the vehicle **1** maintains a time and date clock.

If a refueling or recharging operation is also accomplished then accounting-related data can also be transferred from the vehicle **1** and the local station **50**. It should be realized that the remote station **52** may also be responsible for performing the accounting function, although the accounting function could be accomplished by another station altogether. It should also be appreciated that it is not necessary that a refueling or recharging operation be accomplished in order to make use of the message input and output capabilities that is provided by the system illustrated in FIG. **9** (and also in FIGS. **6–8**).

It should be realized that the functionality of the remote station **52** can be incorporated entirely, or in part, within the local station **50**. That is, the data base **51** can be resident within the local station **50**, and the message selection operation is then accomplished within the local station **50**. Furthermore, message display and optional printing can be accomplished at the local station **50** in lieu of, or as an adjunct to, the display and optional printing of messages within the vehicle **1**.

Based upon the foregoing detailed description of several embodiments of this invention, it is anticipated that those having skill in the art could derive modifications to these embodiments. For example, in an embodiment of this invention not described heretofore an occupant of the vehicle **1** employs the data entry console **1***d* to initiate a query for navigation-related information for a remote destination city. This can be accomplished by entering an identification of the city, state, and the required dates (e.g., Boston, Mass., Jun. 12–Jun. 15). The requested information is retrieved over the communications network **52***a* from the remote city or state, or is retrieved from a file **52***b*. The file **52***b* may be locally stored at the remote station **52**, or may be remotely maintained by some other system, for example within a memory of a networked (coupled to communications network **52***a*) personal, mini, or mainframe computer that is located at a great distance from the local station **50** and/or the remote station **52**.

In response to the query message that is transmitted from the vehicle **1**, via the interface **49** and local station **50**, the remote station **52** employs the communications link **52***a* to access and retrieve the requested navigation-related information. The requested information is then inputted into the vehicle **1** for display to the occupant. In this regard, the information is also preferably stored in the memory **1***b* or within the navigation unit **1***j* for supplementing the primary navigation data for the requested location. For this embodiment the display console **1***c* can include circuitry **1***g*' for providing a digitized voice (DV) audio signal, thereby freeing the occupant from having to read the data. As such, the memory **1***b* is employed to store or cache information received from the local station **50** for subsequent display and/or playback to the occupant of the vehicle **1**. In like manner a microphone and an audio to digital converting and recording (DR) circuit **1***h*' can be provided to generate a digitized voice message from an occupant of the vehicle for transfer through the interface **49** and local station **50**.

In a further embodiment of this invention the user makes a request for primary navigation data, such as an electronically maintained street atlas, and the requested information is then downloaded into the navigation data storage **1***k* for use by the navigation unit **1***j* while the vehicle **1** is required to be in the destination city. When leaving the destination city the primary navigation information can be erased, or can be stored on a removable data storage medium for subsequent use. Accounting for the retrieval and/or use of the navigation-related information by the user can be accomplished as described in detail above, such as by storing a user-specific account number within the memory **1***b*, and transferring the account number along with the request for the navigation-related data.

As the complexity of the vehicle **1** increases, a suitably programmed processor (PROC) **1***i*' may be utilized to manage the flow of information both within the vehicle **1**, and also to and from the local station **50**, via the communications controller **1***a* and the interface **49**.

The display and data entry console of the vehicle's navigation system can be interactively used by the user after the user has left the STATION to select from lists of information. For example, information downloaded into the memory of the vehicle's navigation system can include

separate main groups such as road information, Police/Hospitals, Hotels/Motels, Food, etc. The titles of the different main groups would be displayed on the display and the user, by use of the data entry console, can select one of the titles to thereby select one of the main groups. A new group of subset items for the selected main group would then be displayed on the display. The user could then select one of the subset items. The system could then display a vehicle navigation map on the display with the location of the selected subset item. In an alternate system, a user could select multiple subset items for simultaneous display and comparison. Other navigation information, such as distance, best route, etc. to get to the location associated with the selected subset item could also be displayed. Obviously, many alternative interactive systems, methods, and screen displays could be used.

If a refueling or recharging operation is also accomplished then accounting-related data can also be transferred from the vehicle **1** and the local station **50**. It should be realized that the remote station **52** may also be responsible for performing the accounting function, although the accounting function could be accomplished by another station altogether. It should also be appreciated that it is not necessary that a refueling or recharging operation be accomplished in order to make use of the navigation information supplying capabilities that are provided by the system illustrated in FIG. **9** (and also in FIGS. **6–8**). It should be realized that the functionality of the remote station **52** can be incorporated entirely or in part within the local station **50**.

Based upon the foregoing detailed description of several embodiments of this invention, it is anticipated that those having skill in the art could derive modifications to these embodiments.

In view of the foregoing description, it is intended that this invention not be construed to be limited only to the specific embodiments described above, but is instead to be given a scope commensurate with the several claims that follow.

What is claimed is:

1. A method for inputting information to a vehicle, comprising the steps of:

providing a vehicle that comprises a memory capable of storing information;

coupling the vehicle to a dispenser of a consumable vehicle energy source;

transferring a message from the vehicle to a computer via the dispenser and a data communications network, the message comprising a portion for specifying a request that all or some of the stored information be modified;

in response to a receipt of the message, transferring

information from the computer to the memory via the data communications network and the dispenser; and

inserting the transferred information into the memory for modifying all or some of the stored information.

2. A method as in claim **1**, wherein the stored information is comprised of navigation information.

3. A method as in claim **1**, wherein the message includes a further portion for enabling the computer to account for the transferred information.

4. A method as in claim **1**, and further comprising a step of displaying in the vehicle at least some of the stored information in a human perceptible format.

5. A method as in claim **1**, and further comprising a step of storing at least some of the transferred information onto a removable data storage medium.

6. A method as in claim **1**, wherein the stored information is comprised of a plurality of groups of related information, and further comprising a step of displaying in the vehicle a selected group of related information.

7. A method as in claim **27**, wherein the step of displaying is comprised of an initial step of displaying a list of identifiers, individual ones of which are associated with one of the plurality of groups of related information, and a step of selecting one of the identifiers from the displayed list of identifiers for selecting the group of related information to be displayed.

8. A method for inputting information to a vehicle, comprising the steps of:

providing a vehicle that comprises a memory capable of storing information;

coupling the vehicle to a dispenser of a consumable vehicle energy source;

transferring a message from the vehicle to a computer via the dispenser and a data communications network, the message comprising a portion for requesting that specified information be downloaded to the memory;

in response to a receipt of the message, accessing a file with the computer and downloading the specified information from the computer to the memory via the data communications network and the dispenser; and

storing the downloaded information into the memory.

9. A method as in claim **8**, wherein the stored information is comprised of navigation information.

10. A method as in claim **8**, wherein the message includes a further portion for enabling the computer to account for the downloaded information.

11. A method as in claim **8**, and further comprising a step of displaying in the vehicle at least some of the downloaded information in a human perceptible format.

12. A method as in claim **8**, and further comprising a step of storing at least some of the downloaded information onto a removable data storage medium.

13. A method as in claim **8**, wherein the downloaded information is comprised of a plurality of groups of related information, and further comprising a step of displaying in the vehicle a selected group of related information.

14. A method as in claim **13**, wherein the step of displaying is comprised of an initial step of displaying a list of identifiers, individual ones of which are associated with one of the plurality of groups of related information, and a step of selecting one of the identifiers from the displayed list of identifiers for selecting the group of related information to be displayed.

15. A system for inputting data to a vehicle, comprising:

a dispenser of a consumable vehicle energy source, said dispenser being bidirectionally coupled to a data communications network to which is also coupled at least one computer, said dispenser comprising first data connector means for bidirectionally coupling said dispenser to a second data connector means of a vehicle; and

a vehicle that comprises a data storage memory and said second data connector means for coupling said vehicle to said first data connector means of said dispenser for transferring data into said data storage memory from said computer through said data communications network, said vehicle further comprising a controller for transmitting a message from said vehicle to said computer via said first and second data connector means and said data communications network, the message comprising a portion for specifying data to be transferred into said data storage memory; wherein

said computer is responsive to a receipt of the message for accessing a data store and for transferring the specified

data to said data storage memory via said data communications network, said dispenser, and said first and second data connector means; and wherein

said controller is responsive to a receipt of the transferred data for storing the transferred data into said data storage memory.

16. A system as in claim **15**, wherein the specified data is comprised of navigation information.

17. A system as in claim **15**, wherein the message includes a further portion for enabling said computer to account for the transferred data.

18. A system as in claim **15**, and further comprising a display means in said vehicle for presenting at least some of the transferred data in a human perceptible format.

19. A system as in claim **15**, wherein the stored data is comprised of a plurality of groups of related data, and further comprising a display means in said vehicle for presenting, in said vehicle, at least one selected group of related data in a human perceptible format.

20. A system as in claim **19**, wherein said controller causes said display means to display a list of identifiers, individual ones of which are associated with one of the plurality of groups of related data, and wherein said vehicle further comprises user interface input means for enabling a user to select at least one of the identifiers from the displayed list of identifiers for selecting the associated group of related data to be presented.

21. A system as in claim **20**, wherein said user interface input means is comprised of a manually operated input device.

22. A system as in claim **20**, wherein said user interface input means is comprised of a voice recognition device.

23. A system as in claim **15**, wherein said first and second data connector means are each comprised of a wired connector.

24. A system as in claim **15**, wherein said first and second data connector means are each comprised of a wireless connector.

25. A system as in claim **15**, wherein said dispenser is comprised of a liquid fuel dispenser.

26. A system as in claim **25**, wherein said controller is further operable for transferring indicia from said vehicle to said dispenser via said first and second data connector means for enabling an amount of dispensed liquid fuel to be accounted for.

27. A system as in claim **15**, wherein said dispenser is comprised of an electrical energy dispenser.

28. A system as in claim **27**, wherein said controller is further operable for transferring indicia from said vehicle to said dispenser via said first and second data connector means for enabling an amount of dispensed electrical energy to be accounted for.

29. A system as in claim **15**, wherein said dispenser further comprises display means for presenting at least some of the transferred data in a human perceptible format.

30. A system as in claim **15**, wherein said dispenser further comprises a printer for printing at least some of the transferred data.

31. A method for retrieving data from a computer, comprising the steps of:

coupling a vehicle to a dispenser of a consumable vehicle energy source;

transferring a data request message from the vehicle to a computer via the dispenser and a data communications network that is bidirectionally coupled to the dispenser and to the computer, the data request message comprising a portion for requesting that specified data be retrieved; and

in response to a receipt of the data request message, accessing a file with the computer to retrieve the specified data and transmitting the retrieved data from the computer to the data communications network.

32. A method as in claim **31**, wherein the specified data is comprised of vehicle navigation system data.

33. A method as in claim **31**, wherein the data request message includes a further portion for specifying an account number for enabling the computer to account for transmitting the specified data.

34. A method as in claim **31**, and further comprising steps of:

inputting to the vehicle the transmitted data from the data communications network via the dispenser;

storing the inputted data within a memory; and

presenting, in the vehicle, at least some of the stored data in a human perceptible format.

35. A method as in claim **33**, and further comprising a step of further storing at least some of the stored data onto a removable data storage medium.

36. A method as in claim **33**, wherein the inputted data is comprised of a plurality of groups of related data, and wherein the step of presenting presents a selected group of related data.

37. A method as in claim **35**, wherein the step of presenting is comprised of an initial step of presenting a list of identifiers, individual ones of which are associated with one of the plurality of groups of related data, and a step of employing a user input means for selecting one of the identifiers from the displayed list of identifiers for selecting the group of related data to be presented.

38. A method as in claim **31**, and further comprising steps of:

inputting to the dispenser the transmitted data from the data communications network; and

presenting, with the dispenser, at least some of the inputted data in a human perceptible format.

39. A method as in claim **31**, wherein the dispenser is comprised of a dispenser of fuel.

40. A method as in claim **31**, wherein the dispenser is comprised of a dispenser of electrical current.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,185,501 B1
DATED : February 6, 2001
INVENTOR(S) : H.F. Smith et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 14, claim 7,
Line 3, delete "27" and replace with -- 6 --.

Column 16, claim 35,
Line 30, delete "33" and replace with -- 34 --.

Column 16, claim 36,
Line 33, delete "33" and replace with -- 34 --.

Column 16, claim 37,
Line 37, delete "35" and replace with -- 36 --.

Signed and Sealed this

Thirteenth Day of November, 2001

Attest:

Nicholas P. Godici

Attesting Officer

NICHOLAS P. GODICI
Acting Director of the United States Patent and Trademark Office