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(21) International Application Number: PCT/US99/04600 (22) International Filing Date: 3 March 1999 (03.03.99) (30) Priority Data: 60/076,647 3 March 1998 (03.03.98) US (71)(72) Applicant and Inventor: BRENNAN, Sherry, K. [US/US]; 132 A. Carlotta Circle, Mill Valley, CA 94941 (US). (74) Agents: CELLA, Charles, H. et al.; Foley, Hoag & Eliot, LLP, One Post Office Square, Boston, MA 02109 (US).		(81) Designated States: AU, CA, JP, KR, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: DESTINATION LOCATOR CARD AND TERMINAL (57) Abstract A method of providing information to mobile users is provided in which a network of smart cards containing information associated with the location of the smart cards is provided and mobile users are provided with a monitor for retrieving and displaying information stored on the smart cards. <div data-bbox="810 1249 1364 1585" data-label="Image"><p>The diagram shows a rectangular card with rounded corners. The word "DESTINATOR" is printed in large, bold, sans-serif capital letters in the upper half. The word "CARD" is printed in smaller, bold, sans-serif capital letters in the lower right corner. A small number "1" with a curved line points to the top right corner of the card.</p></div>		

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DESTINATION LOCATOR CARD AND TERMINAL

FIELD OF THE INVENTION

5 The present invention relates to electronic card technology, and more particularly to an electronic card that contains specific navigational information to guide a driver of a vehicle to a particular location according to either the fastest, safest, or most scenic route, and provide referential information regarding that particular location and its nearby natural and manmade offerings.

BACKGROUND OF THE INVENTION

10 Today's automobiles, whether economy or luxury models, utilize dozens of computerized electronic devices that either make the vehicle perform better or enhance driver amenities. The automotive industry has also responded to the advantages of smart card technology in recent years. Mobile data capture systems, on-board computers, and other types of navigation systems are now becoming standard equipment in specialized vehicles such as ambulances and police transports. Thus, the beginning of an infrastructure for receiving, manipulating and displaying data from external sources already exists and is steadily growing, particularly in western European countries.

20 Mobile communications technology has improved significantly as well. Satellite communications technology, cellular phone technology, and other communications technology now permits transmission of certain data to and from mobile units, such as those in automobiles. For example, in the United States, a major trucking company can locate via satellite any of their 1,400 trucks traveling on American highways at any moment of the day or night. Current uses of such technology are quite limited. In particular, a need exists for an improved infrastructure for the storage, manipulation and delivery of information to mobile users.

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Smart card technology permits compact, mobile data storage, manipulation and retrieval; however, uses of smart cards in the automotive industry are still limited. Smart cards are used to log and transfer service expenses from driver and mobile unit to the company headquarters, with precise billing being a natural evolution of this information retrieval. In the area of non-industrial use, computerized databases that log travel routes for particular cities in England have been developed, with the ultimate goal of the production of a "driverless" car in the future. In this context, the possibility of offering the most detailed and exact electronic assistance to the ordinary driver is desirable.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a method of providing information to mobile users employing a network of smart cards containing information associated with the location of the smart cards and a monitor for retrieving and displaying information stored on the smart cards.

It is an object of the invention to provide an electronic card, which may be a smart card, that contains specific navigational information to guide a driver of a vehicle to a particular location according to either the fastest, safest, or most scenic route, and provide referential information regarding that particular location and its nearby natural and manmade offerings.

It is an object of the invention to use smart card technology to allow the storage of information that can be location-specific and be of as exact detail as a driver may request, or require in an emergency.

It is an object of the invention to permit those who offer services, i.e., hotels and restaurants, to provide information to mobile users through smart card technology.

5 It is an object of the invention to provide, with the use of antennae and fiber optic lines, an area-wide, state-wide or nationwide network, similar to that employed by the cellular phone industry, of microchip-embedded electronic cards that can generate exact directions and other information regarding a desired location and display this information on a monitor to be read by the driver.

10 It is an object of the invention to provide mobile users, via smart cards distributed in a network of locations, with an astounding array of detailed, user-defined information that will provide both convenience and personal safety.

15 It is an object of the present invention to provide a means by which an automobile driver may elicit and view land directions to a particular destination using an electronic user-specified card inserted into an on-board reader, and provide information through electronic interaction identified as designated outcomes that can be retrieved and displayed on a monitor in the automobile.

20 It is another object of the present invention to offer specific land direction options that correspond with the kind of route the driver selects, i.e., the fastest route to the location, the most scenic route to the location, the safest route to the location (bypass of high-crime areas), the route to the location using secondary roads, tourism routes, etc.

25 It is yet a further object of this invention to provide a means by which complementary information regarding entities proximal to the destination is made available to a driver, allowing both pertinent driver information and an advertising medium for multi-partner advertising schemes.

30 It is still a further feature of this invention to provide an area-wide infrastructure utilizing antennae to direct the driver to terminals (stations or kiosks) so that cards may be used in uninterrupted fashion across wide service delivery areas.

It is another object of this invention to display all card information by way of a monitor that is conveniently located, user-friendly and able to be fully controlled by the driver.

5 It is thus a feature of this invention to provide a completely personalized, tailored and user-friendly routing aid for the automobile driver who is driving in unfamiliar areas.

10 It is yet another feature of this invention to assist the driver in daily vacation planning and tourism activities without the need for pre-arranged tours or guided vacation programs.

15 It is yet another feature of this invention to allow the long-distance traveler to be able to completely guide his own travel upon departing from an airport or a car rental agency.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front facial view of the card.

20 FIG. 2 is a view of sections of microchip as an internal component of the card showing three discrete information sources.

FIG. 3 is a descriptive view of several pre-printed cards.

25 FIG. 4 is an automobile interior locating the card reader and optional locations for the monitor of the present invention.

FIG. 5 is a descriptive view of the elements available on the monitor of the user.

FIG. 6 is a view of a highway and terrain scene depicting the placement of antennae, terminals (stations, kiosks) and grid representation of communication range or coverage of land area by antennae.

5 FIG. 7 is a depiction of a station or kiosk showing the facility's menu selection and storage of cards.

FIG. 8 is a depiction of a terminal showing the terminal's menu selection and storage of cards.

10 FIG. 9 is a flow chart depicting use of the present invention in normal use.

FIG. 10 is a flow chart depicting use of the present invention in emergency use.

15 DETAILED DESCRIPTION OF THE INVENTION

The card of the present invention is a microchip-embedded card or any electronically-activated design system utilized as a mechanism for storing driver directions from a specific freeway exit or some other location to an exact proximal location and also contains additional information that is pertinent to the needs of the driver and/or pertinent to that destination site. The card contains this primary and secondary information in three distinct, self-contained microchip segments, the information from which can be activated from the monitor's menu display found in the driver's automobile. The card is placed in the vehicle's "reader" and activated. The information is then displayed on the monitor and reviewed by the driver. Communication transfer by way of a driver-controlled readout allows use of cards in most driving conditions. Cards are produced according to a grid or "cell" mapping of land area as are antennae that alert driver to the closest terminal (station or kiosk) dispensing cards. Cards also can be acquired by a variety of methods, in addition to terminals (stations/kiosks) placed at strategic locations in the service delivery area.

Secondary information related to driving options may take the form of routes which are the fastest, safest (bypass of high-crime areas), most scenic, route by secondary roads, etc., is a complementary offering of the card and can be considered an option.

5 Secondary information related to the location and access of emergency services is a complementary offering of the card and can be considered another option. Examples of emergency services are listed: police departments, fire departments, EMT services, etc.

10 Secondary information related to multi-partner schemes for advertising is a complementary offering of the card and can be considered yet another option. Examples of vendors are listed: hotels; motels; b&b's; public and private camp sites, trailer/camper sites; national, state and county parks and recreational areas; nature reserves; youth and elder hostels; restaurants; cafeterias; diners; fast-food chains; ethnic food restaurants; vegetarian restaurants; take-out restaurants; grocery store chains; bakeries; tourist food stores;

15 entertainment spots; one-time state or county locales of special events; concerts; night clubs; bars; dance clubs; music (reggae, rock, C&W, etc.) clubs; gambling clubs; movie theaters; live theaters; schools, colleges, and universities/campuses; seminaries; auto assistance such as car repair shops, gas stations, towing services, muffler/brake shops and car rentals; locations of community services such as Rotary clubs, Lions clubs, VA clubs,

20 churches, synagogues and 12-step programs/meeting sites; spiritual centers and retreat centers; hospitals, urgent care clinics, free clinics, emergency dental clinics, ambulance services, animal hospitals and emergency vet services; urban tourist areas; locales with national or state monuments; natural beauty attractions; moped/bicycle/car rentals; tourism stores/shopping areas; and independent large and small businesses such as department

25 stores, specialty stores, medical buildings, law offices, district offices of major corporations, business headquarters, etc.; and locales pertinent to traveler needs and interests such as airports, highway interstate exchanges, tourist assistance, Traveler's Aid and foreign banks/money exchange centers.

5 The present invention may be any electronic card capable of storing data, but is preferably a smart card. The card of the present invention may be activated when inserted into a mobile smart card reader located in the driver's automobile, in which case the information is displayed on a monitor within the driver's visual field. The reader or monitor
10 may be secured on or installed into the dashboard, on the sun visor, as part of the steering wheel, or elsewhere in the vehicle, preferably in a manner to reduce driver's visual distraction. In an embodiment of the invention, nine soft-pressure buttons may be located on the four sides of the display to provide driver control of the type and presentation of information. Through use of the control buttons, the user can either review or advance the printed display, or brighten or dim the luminosity of the printed display.

15 Information is supplied to the user through a network of pole antennae at designated highway exit sites or other designated sites. The sites carry the information for their particular ranges or "cells" until the driver reaches another antenna and its corresponding "cell." The transfer and continuation of communication transfer by way of a driver-
20 controlled readout allows use of smart cards in most driving conditions. Smart cards are produced according to a grid or "cell" mapping of land area as are antennae that alert driver to the closest terminal (station or kiosk) dispensing cards or access local help in emergencies. Designated highway exit sites or other sites near popular areas of tourism or exit sites which show heavy automobile traffic, either business traffic or tourist traffic, are
25 considered prime areas to be serviced by a greater number of smart cards. Key land locations are sites for terminals or stations that offer cards for that particular area's businesses, critical care services, tourism attractions, major shopping locations, etc. Cards may be returned at the driver's destination. Cards may also provide a selection of land directions from which the driver may choose, depending on his requirements, i.e., "scenic route," "route via low-crime areas," "major highway route," "route by secondary roads," etc.

In a multi-partner scheme, a card may also identify restaurants, hotels, specialty shops, etc., in proximity to the card's site as well as combine land directions to be included as part of advanced automotive applications using smart card technology.

FIG. 1 shows the front facial view of the card, with the name identification 1 depicted.

FIG. 2 presents the rear (internal) view of the card, and the internal microchip element is shown 2, where three discrete information sources 3, 4, 5 are illustrated -- a section maintaining the standard directions from the identified location to a second location 3, a section maintaining a selection of optional directions from the identified location to a second location 4, and a section maintaining complementary information regarding the second location 5.

Fig. 3 shows a descriptive view of cards 6 with examples of various name entities 7.

FIG. 4 presents the automobile interior where the card monitor is shown in three optional locations, on the sun visor 8, directly above the rear view mirror 9, and on the front dashboard 10. The card can be placed in the on-board reader 11 to be activated. It should be understood that the monitor could be any conventional card reader, such as a proprietary on board reader provided by an automobile company, or the like.

FIG. 5 gives a close-up view of the monitor of the user. The monitor presents printed information on its display, which may be a light-emitting diode, liquid crystal display, or similar display, such as those used on conventional calculators 12. The monitor is operated by the automobile driver using nine soft-pressure buttons 13, 14, 15, 16, 17, 18, 19, 20, 21. The On/Off button 13 activating the readout on the monitor's display is pressed to begin operation. Directly below the On/Off button 13 is the button 14 that activates the menu selection from which the driver can identify the communication data he wishes to appear on the display. The two buttons 18, 19 to the right of the monitor's display regulate

the speed and luminosity, respectively, of the printed information crossing the display. The two buttons **15, 16** at the bottom left of the monitor allow the driver to advance and replay, respectively, the printed information shown on the display. The two buttons **20, 21** at the bottom right of the monitor allow the driver to control other desired information that may be selected in programming the monitor. The bottom center button **17** is the emergency call button, which both activates the monitor (bypassing the Off/On button **13**) and notifies the closest police station, through fiber optic lines, of the exact location of the vehicle. The rear of the monitor, when located on either the sun visor, dashboard or rear view mirror, may be constructed using several kinds of mounting methods, such as clips, screws, magnetic latches, hinges, etc. **22** to provide the required movement that permits the monitor to fold either upward, backward, or within, in order to store out-of-sight when not in use.

FIG. 6 is a depiction of a main highway and surrounding terrain, where antennae **23** are located along or nearby the highway to allow the driver to fully access all options of his card, including the access of emergency services. The antennae **23** deliver card service to an area where the driver may wish to use the card to locate the closest terminal (station) **24** or kiosk **25**, a larger terminal facility. Continuous service delivery of potential activity is illustrated by way of consecutive grids or "cells" **26** that permit card use over a wide area or region.

FIG. 7 presents a full frontal view of a larger version of a terminal or station depicted as a kiosk. The terminals provide storage **28** of cards for the particular area or region, and these cards may be reviewed and accessed via a menu **27**. It should be understood that the terminals, rather than storing smart cards, could store or consist of any other device, such as a personal computer, capable of storing, manipulating, retrieving and transmitting information stored in databases. Thus, the terminal could include a proprietary database of information that is downloaded to a blank disk, card that is displayed in a monitor in the vehicle. The data link from the terminal to the monitor could also be via radio frequency, infrared, or other transmission.

Fig. 8 presents a full frontal view of a terminal or station **24** and its larger version as a kiosk **25**. The terminals provide storage **28** of cards for the particular area or region, and these cards may be reviewed and accessed via a menu **27**.

5 It is at the terminals 24 that cards may be acquired. Once the driver has a card to insert into the automobile's reader, the system is operational. Without a card, the only free-standing service provided by the unit in the automobile is the emergency service delivery. This free-standing emergency service is continuously available when the automobile is passing through a "grid" system of antennae, which permits a distress signal to be sent by
10 the automobile's driver and received by police stations (or 911 receiver sites) found within the grid or region of coverage. The signals are carried by way of fiber optic lines from the unit found in the automobile to the closest police station in the vicinity.

15 Terminal location maps may be provided for each region, area or state. Or, in similar fashion as the start-up of state lottery sites, which found their point of sale in grocery stores, newsstands, tobacco shops and such, the terminals can be installed at particular gas stations, for example, Arco or Mobil or Chevron gas stations, or named-recognized hotels and restaurants. As the card use becomes widespread, the location of terminals can be part of a computerized data base found within the reader itself and
20 available for each state.

25 For emergency assistance, the reader has a factory smart card, or an element that is already built in to the main component, that is included in the purchase of the unit. This card, when placed in the reader, activates the unit, and this activation allows the automobile to enter the grid system provided by the regional or area antennae and to receive data from the antennae. The driver need not purchase a card to be able to have emergency services provided. This service is automatically part of the unit. Of the local and state police stations in the particular grid, the police station closest to the location of the driver's automobile sending out a distress signal is the station notified. The driver activates the
30 distress signal by pressing the emergency call button found in the bottom center of the

monitor. (As the system becomes more popular, additional selections can be offered to the emergency coverage, i.e., hospital/ambulance/paramedic services, etc.)

5 The primary utility of the card is to provide well-described land directions from the location of the automobile to the driver's desired location. The initial location of the automobile is assumed to be the location of the terminal dispensing a given card that is associated with that location. All cards offered at that particular terminal have directions which originate from that particular terminal location. If the card is pre-purchased or acquired by some other means, such as a tourist office package, parks and recreation
10 department package, food franchise marketing and advertisement offering, car rental agency incentive package, or the like, directions begin from a particular freeway exit or other readily identifiable location. The specific directions are contained on a microchip in the card, and this information is able to be retrieved and read when inserted into the reader, and then shown on the monitor's display for the driver. The driver has full control of the
15 presentation of the information through the use of the button controls found on the monitor.

Databases of information may be stored by the card for processing by a microprocessor of the card. A first information database may store, manipulate and retrieve information relating to specific directions to a particular location and a selection of
20 alternative directions to that location. A second database may store, manipulate and retrieve information relating to complementary information about the area surrounding that particular location, that is, proximal hotels, restaurants, tourist interests, resources for traveler needs, and the like.

25 It should be understood that other embodiments of the present invention are recognizable by one of ordinary skill in the art, and such embodiments should be understood to be encompassed by the present disclosure, as limited only by the following claims.

CLAIMS

What is claimed is:

1. A method of providing information to mobile users, comprising:
5 providing a network of smart cards containing information associated with the
location of the smart cards; and
 providing a monitor for retrieving and displaying information stored on the smart
cards.



Fig. 1

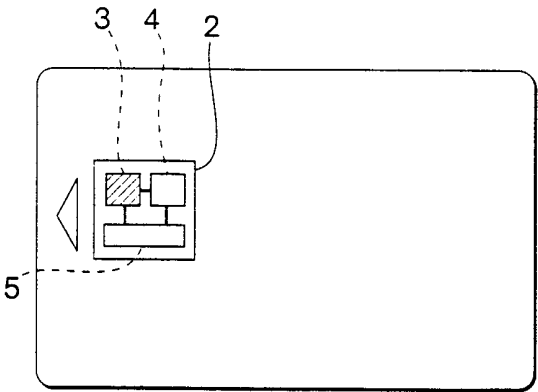


Fig. 2

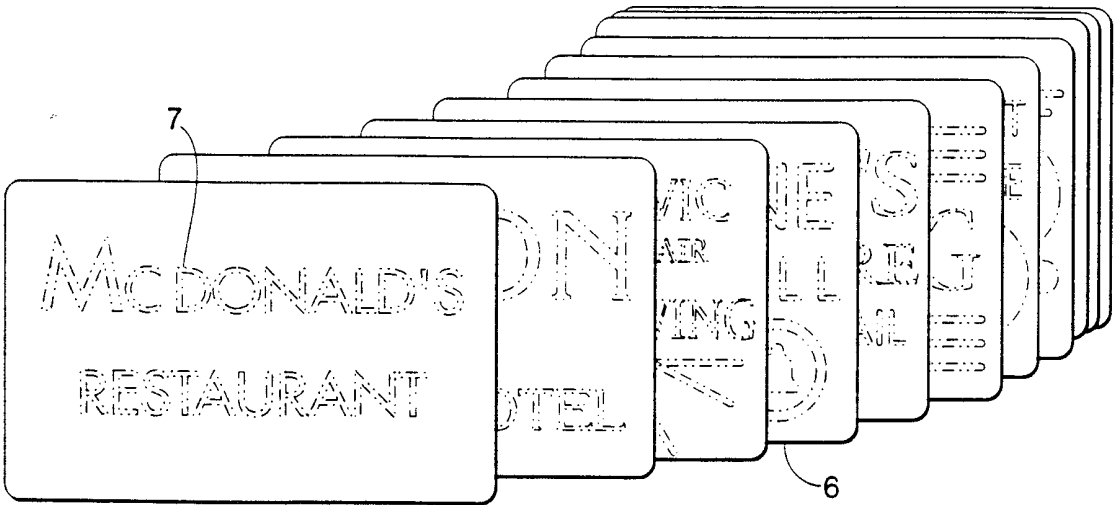


Fig. 3

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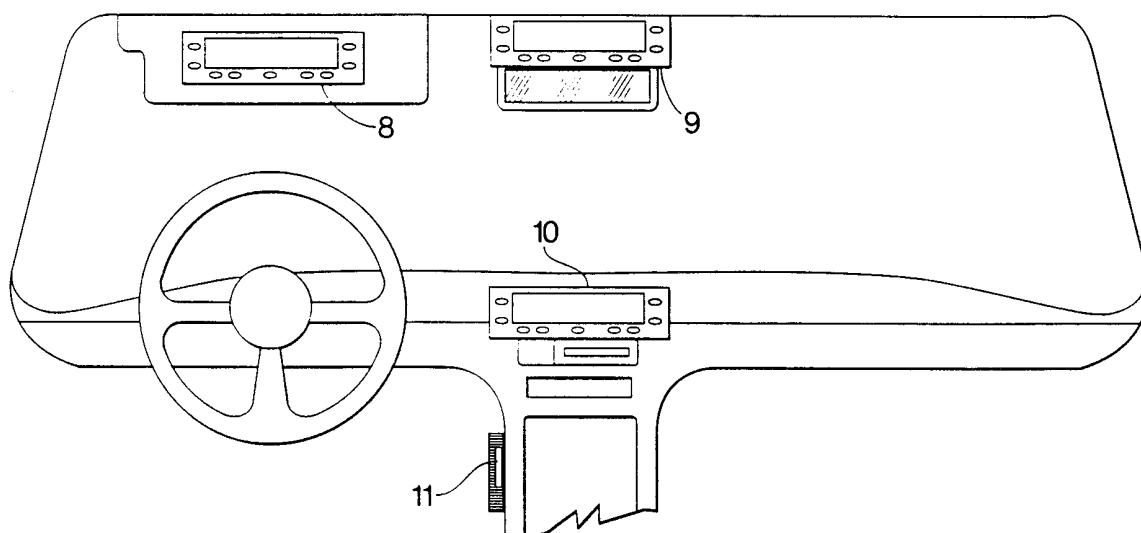


Fig. 4

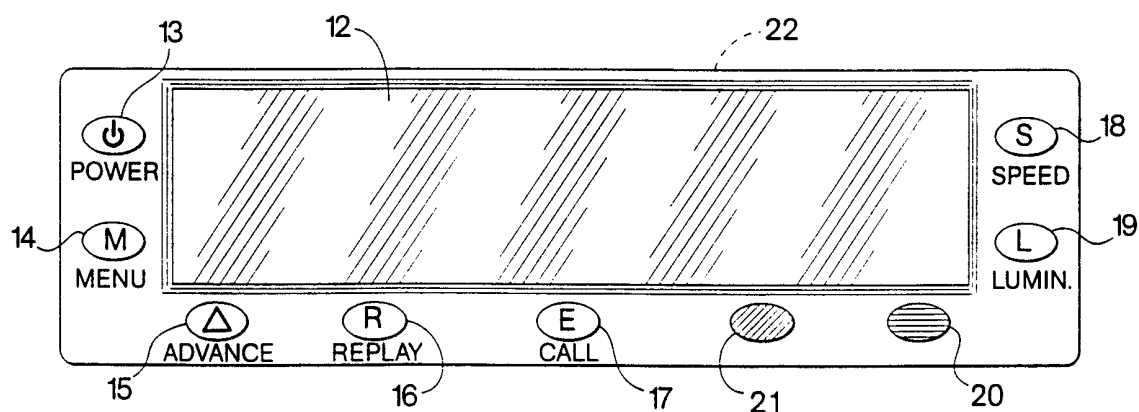


Fig. 5

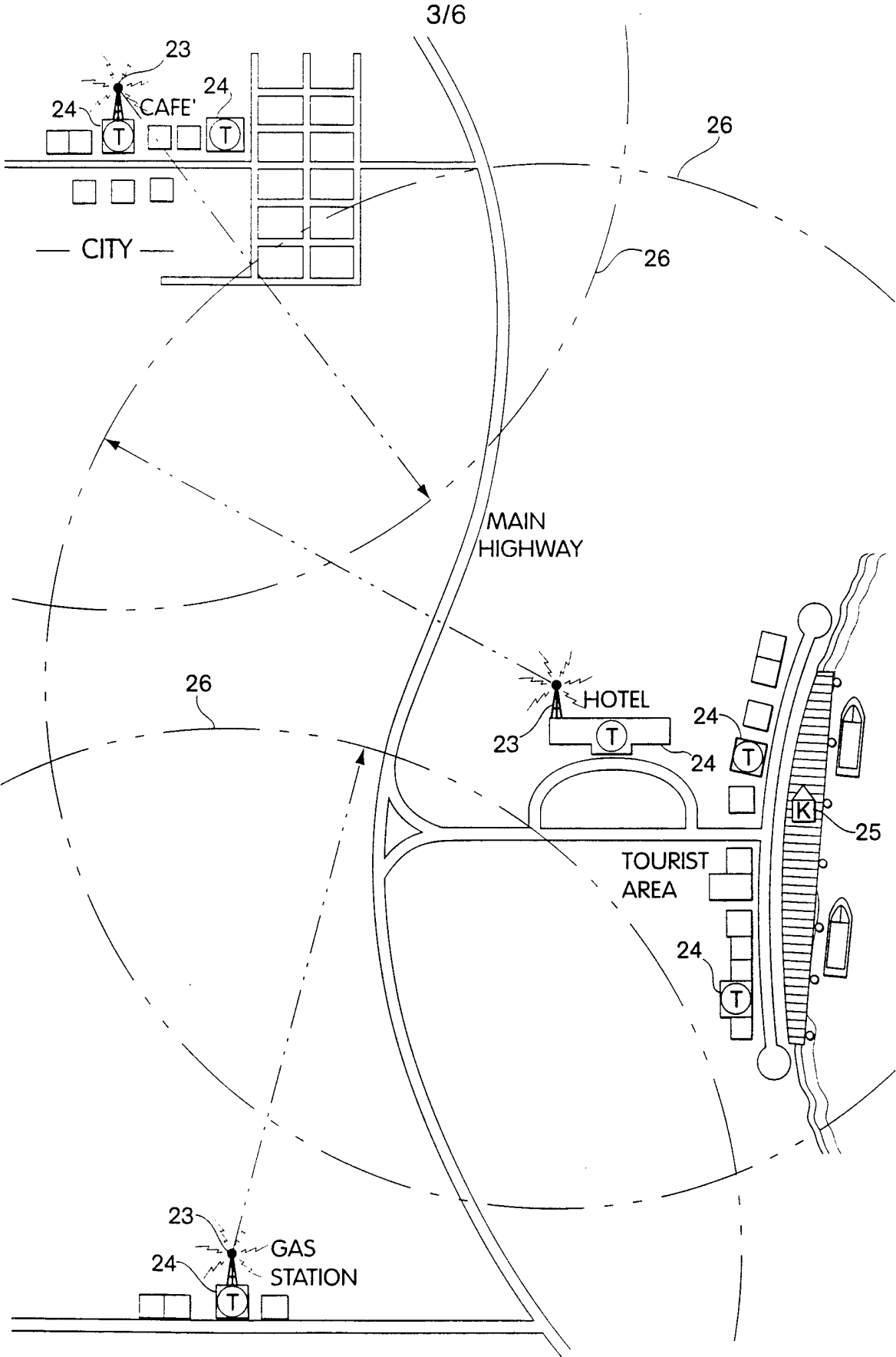


Fig. 6

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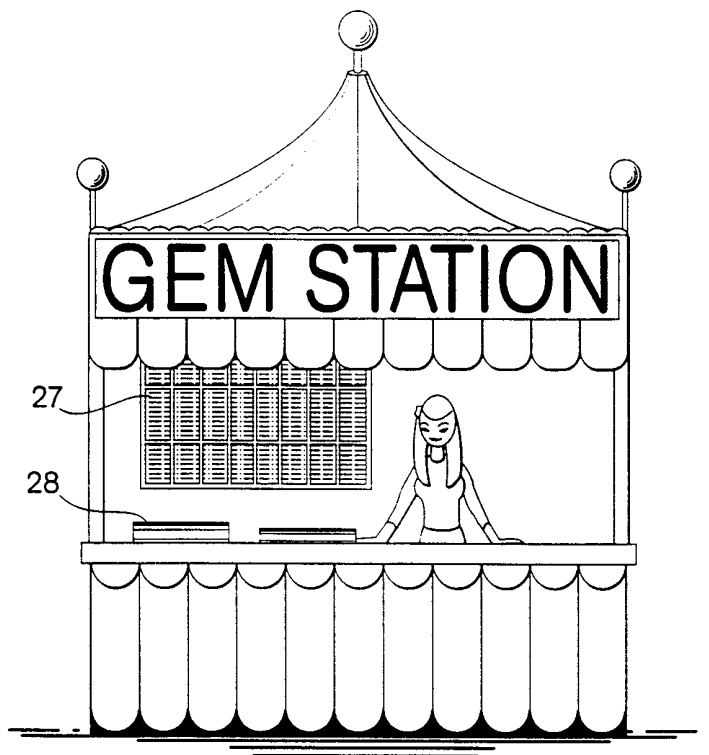


Fig. 7

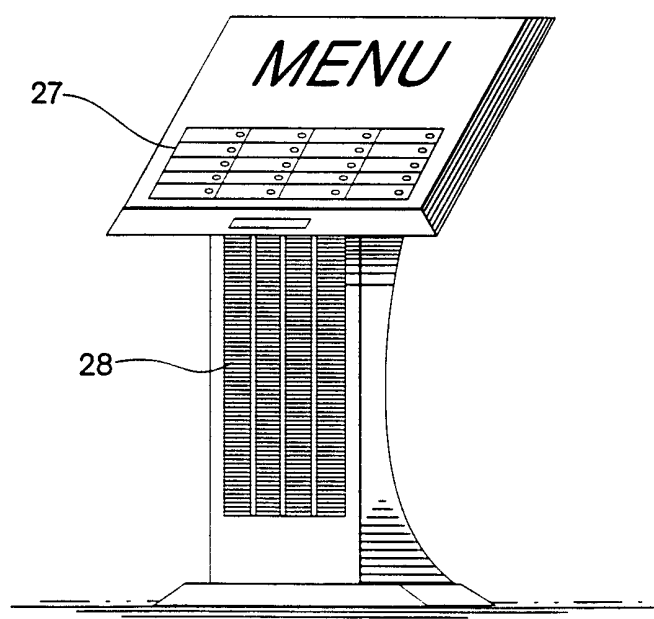


Fig. 8

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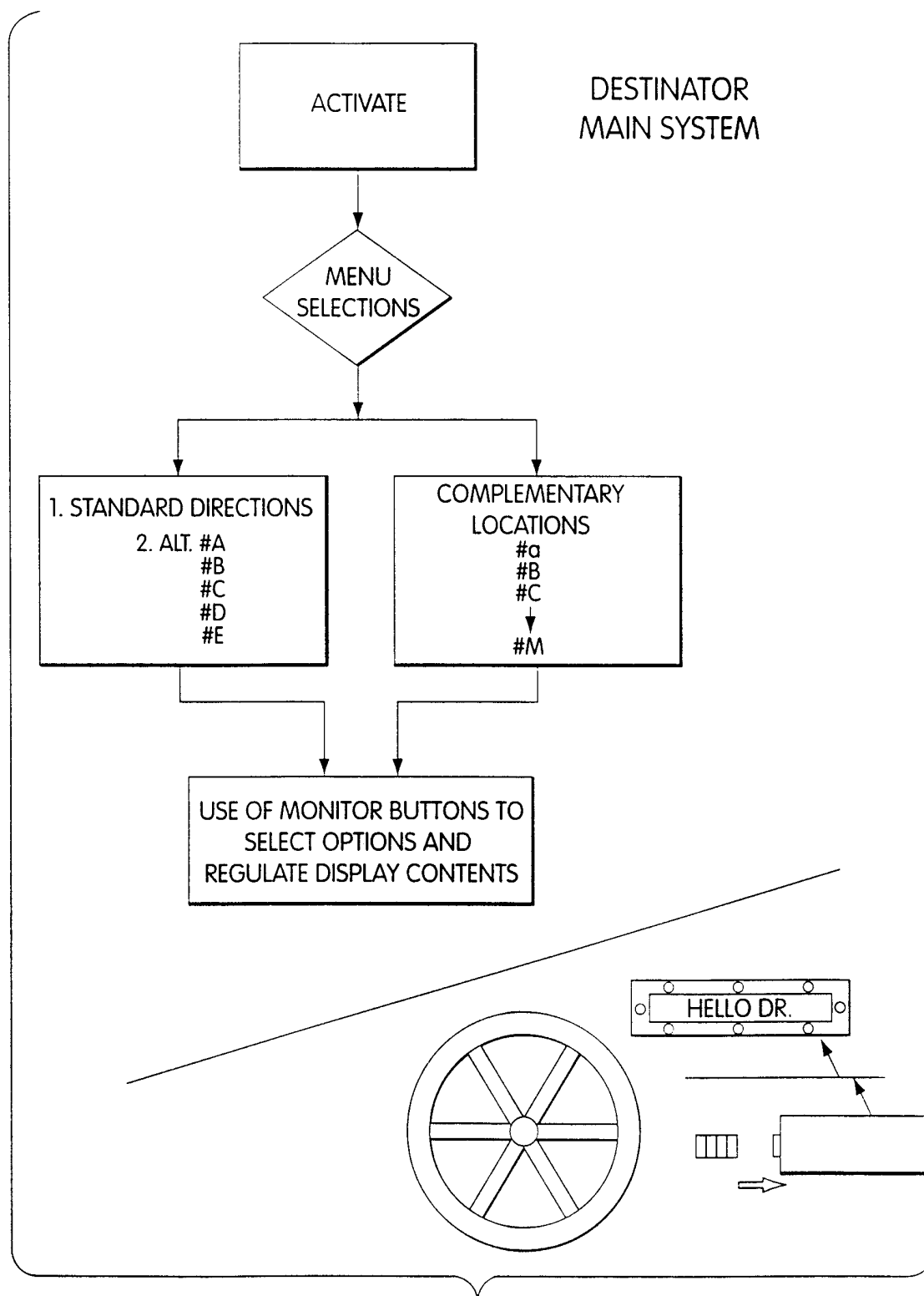


Fig. 9

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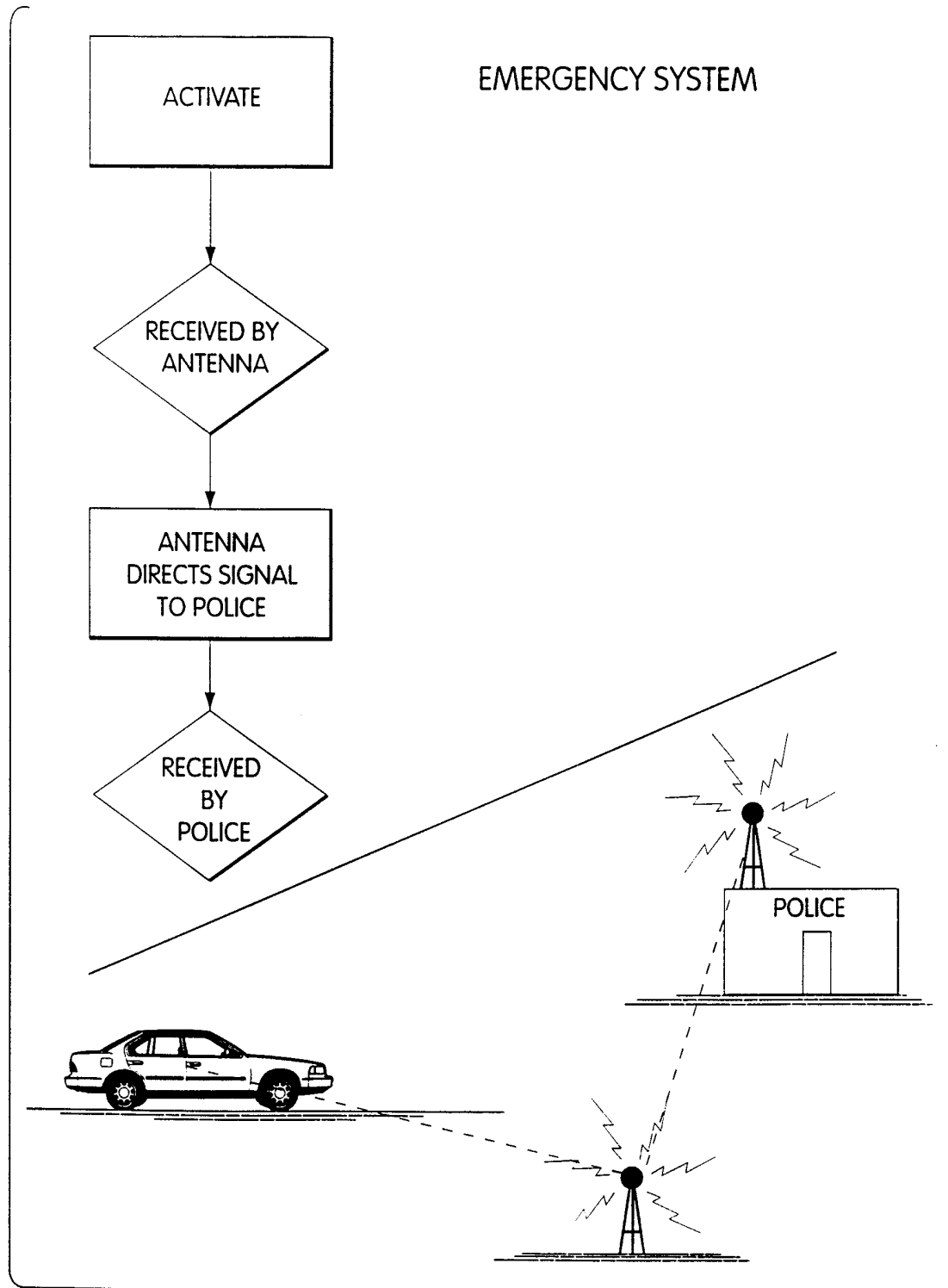


Fig. 10