

Case Docket No. 60,314-054

Date: October 22, 1998

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D. C. 20231

Sir:

Transmitted herewith for filing is a patent application of

Inventor:

For:

Enclosed are:

- ☒ 5 sheets of informal drawings.
- ☒ An Assignment of the invention to Magellan DIS, Inc.
- ☒ A certified copy of a \_\_\_\_\_ application.
- ☒ A Combined Declaration and Power of Attorney
- ☐ An associate power of attorney.
- ☐ A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27.
- ☐ PTO Form 1449 with copies of patents cited in specification.

The filing fee has been calculated as shown below:

	No. Filed	No. Extra	Small Entity		Large Entity	
Basic fee				\$395	X	\$790
Total Claims	29-20	9	X11	\$0	X22	\$198
Indep. Claims	4-3	1	X41	\$0	X82	\$82
Multiple Depend. Claim(s) Present _____						----

TOTAL \_\_\_\_\_ TOTAL \$1070

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Respectfully submitted,

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## STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM

### BACKGROUND OF THE INVENTION

This invention relates generally to a navigation or route guidance system and,  
5 more particularly, to a vehicle location display for a route guidance system.

Navigation systems generally provide a recommended route from a starting  
point to a desired destination. Generally, the starting point and desired destination  
are selected from a large database of roads stored in a mass media storage, such as  
a CD ROM or hard drive, which includes the roads in the area to be travelled by  
10 the user. The navigation system can be located in a personal computer or it can be  
installed in a vehicle. If the navigation system is installed in a vehicle, the starting  
point is typically the current position of the vehicle, which can be input to the  
navigation system by an associated position determining system that usually includes  
a GPS (Global Positioning System) receiver.

15 The navigation system determines a route from the starting point to the  
destination utilizing an algorithm well-known to those in the art and currently in use  
in many navigation systems. Usually there are many potential routes between the  
selected starting point and the desired destination. Typical navigation systems select  
a recommended route based upon certain "cost" values associated with each segment  
20 of road in the road database. These cost values include the length of the road  
segment and the estimated time of travel through the road segment. The navigation  
system selects the potential route with the lowest total cost to be the recommended  
route. Depending upon the predetermined algorithm of the navigation system, the

navigation system will recommend the route with the shortest total length, the lowest total time, or some weighted average of length and time.

The recommended route is then displayed to the user as a map showing the starting point, desired destination and highlighting the recommended route.

- 5 Preferably, if the navigation system is installed in a vehicle, the navigation system displays the current location of the vehicle and provides turn-by-turn instructions to the driver, guiding the driver to the selected destination.

10 The typical navigation system provides the current vehicle location to the user by displaying either a textual guidance mode screen having a set of instructions and the current location or a guidance mode map showing the starting point, desired destination, current location and highlighting the recommended route. When a user has not determined a route, the typical navigation system displays a map showing the current vehicle location and all of the surrounding streets. Such a system is described in co-pending application Serial Number 09/114,670 filed July 13, 1998,  
15 which claims benefit of provisional application Serial Number 60/084,292, filed May 5, 1998. The disclosures of Serial Number 09/114,670 and 60/084,292 referenced above are hereby incorporated by reference in full.

20 The typical navigation system also permits a user to adjust the scale of a displayed map. Frequently a user desires to "zoom out" by increasing the map scale to enable the user to see a larger area of the database. One disadvantage of current map zoom functions is that when a user zooms out it can be difficult, because of the complexity of a larger scale map, to see the current vehicle location on the large scale map. Also, in a current navigation system when a smaller scale map is

displayed the user is provided with the name of streets on the map, this information can not be provided on the larger scale display.

The typical navigation system also permits a user to pan the map to areas other than the current location. One disadvantage when panning a large scale map is that the user is not provided with a street name of a panned street.

Thus, it is desirable to provide a vehicle location display for a navigation system that permits a user to alter the scale of a displayed map to a large scale while still providing the user with information concerning the current vehicle location. In addition, it is desirable to provide information to a user regarding a panned street when the scale of a displayed map is large.

### **SUMMARY OF THE INVENTION**

In general terms, this invention provides a vehicle location display for a navigation system.

In one embodiment the vehicle location display comprises a database of a plurality of road segments each having an associated road segment name. The vehicle location display also includes a display that displays a map at a variable scale and comprising a plurality of the road segments including the current road segment. The display displays an associated road segment name adjacent the current road segment when the variable scale is below a threshold scale. The display displays the associated road segment name of the current road segment in a current location field on the display not adjacent the current road segment when the scale is above the threshold scale.



In a preferred embodiment the vehicle location display accents the current road segment and the associated road segment name when the variable scale is above the threshold scale by displaying them in a first color on the display. In a most preferred embodiment the vehicle location display includes a map scaler that  
5 adjusts the scale of the map in response to input from a user input device.

These and other features and advantages of this invention will become more apparent to those skilled in the art from the following detailed description of the presently preferred embodiment. The drawings that accompany the detailed description can be described as follows.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is a schematic of a navigation system with a vehicle location display designed according to the present invention installed in a vehicle;

Figure 2 is a screen display of one embodiment of the vehicle location display illustrating a map having a scale below a threshold scale;

Figure 3 is a screen display of the vehicle location display shown in Figure 2 when the map has a scale above the threshold scale;

Figure 4 is a screen display of another embodiment of the vehicle location display illustrating a map having a scale above the threshold scale; and

Figure 5 is a screen display of another embodiment of the vehicle location display illustrating a second map within a first map when the first map has a scale above the threshold scale.

5        **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

10        The navigation system 20 of the present invention is shown schematically in Figure 1. The navigation system 20 includes a CPU 22 (Central Processing Unit) having a route determination system 21 and a map scaler 23. Preferably, the route determination system 21 and the map scaler 23 are implemented in software on the CPU 22. The CPU 22 is connected to a display device 24, such as a high resolution LCD or flat panel display. The CPU 22 is also connected to a user input device 26. The navigation system 20 further includes a database 28 connected to the CPU 22. The database 28 is a mass media storage device, such as a CD ROM or hard drive, which includes data of all the roads in the area to be travelled by the user. The navigation system 20 can display a map on display device 24 based on the data in the database 28. The scale of the map, for example 1:265,000, is a variable scale that can be altered by a user through the user input device 26 and the map scaler 23.

20        Each road in the database is divided into road segments, each having an associated set of cost values, which indicate the "cost" of traveling that road segment. For example, the cost values may include the length of the road segment, the estimated time to travel the road segment, and the type of road (i.e., highway, secondary road, toll road, one way, etc.). Each road segment also has a road

segment name associated with it. Generally, each road segment comprises the portion of a road between adjacent cross roads to the road.

Using algorithms well known in the art, route determination system 21 determines a route on the road segments from a beginning point to a user selected destination point. Preferably, the beginning point is the current vehicle location as determined by the CPU 22 and one of the position determining devices discussed below. The determined route is preferably based on the cost values. Preferably, the navigation system 20 displays the determined route on display device 24 and provides turn by turn instructions to the user.

Each road segment in the database 28 has a rank associated with it. The rank, for example, may be a number from zero to four, with four being the highest rank. The rank of a road segment is determined by a number of factors including: road geometry, such as the number of lanes; speed limit of the road segment; and type of road segment, such as freeway, primary street or subdivision street.

Generally, the rank divides road segments from highest rank to lowest rank into a freeway, a primary street, a secondary street, and a subdivision street with a freeway being the highest rank. The rank of a given road segment can not be altered by a user. The CPU 22 associates a unique rank color with each of the ranks. The display device displays each road segment in its associated rank color.

Thus, for example, a highway, which has the highest rank may have a rank color of red and a subdivision street, which has the lowest rank may have a rank color of gray.

The navigation system 20 can, but need not, be installed in a vehicle 32. The navigation system can be used in conjunction with position determining devices, such as a GPS receiver 34, a gyroscope 36, a compass 38, an orthogonal multi-axis accelerometer 40 and a vehicle speed sensor 42, all connected to the CPU 22 (connections not shown for simplicity). Such position determining devices are well-known and are commercially available. Preferably, a combination of these position determining devices is utilized. Using known software algorithms and technologies, such as dead-reckoning or map-matching or others, the CPU 22 in combination with the position determining device comprises a position determining system that determines the current position of the navigation system 20 or the vehicle 32 relative to the map database 28. The current position determination includes a determination of a current road segment and a current vehicle location on the current road segment.

Figure 2 is a screen display of one embodiment of a vehicle location display shown generally at 50. Vehicle location display 50 includes a map 52 displayed on display device 24. Map 52 is comprised of a plurality of road segments 53 and includes a current road segment 54, which is determined by the position determining system, described above. A vehicle cursor 56 is located at a current vehicle location, also determined by the position determining system, on current road segment 54. A road segment name field 58, shown in phantom, is located adjacent at least one road segment 53 of each road including current road segment 54. A road segment name associated with the adjacent road segment 53 is displayed in each road segment name field 58. Vehicle location display 50 also includes a

current heading field 60, shown in phantom, that displays a current compass heading of vehicle 32. As discussed above, map 52 is comprised of a plurality of road segments 53, generally each road segment 53 comprises the portion of a road between adjacent cross roads of that road. If there is a long distance between cross roads, then a road segment may be a portion of a road that is not defined by cross roads. Preferably each road segment 53, and the current road segment 54 are displayed in their associated rank color, described above. In Figure 2 the scale of map 52 is below a threshold scale, thus vehicle location display 50 operates in a first mode and map 52 displays associated names in the road segment name fields 58. The threshold scale is preferably set at a scale that displays a map 52 that is not overly complex or detailed and represents a fully zoomed in view.

In Figure 3 vehicle location display 50 is shown when the scale of map 52 is above the threshold scale, in other words, the user has zoomed out. The scale of map 52 is variable and can be adjusted through user input device 26 and map scaler 23. When the scale of map 52 exceeds the threshold scale vehicle location display 50 operates in a second mode and further includes a current location field 62. Current location field 62 displays the road segment name associated with current road segment 54. Preferably, when the variable scale exceeds the threshold scale map 52 no longer displays the associated names in the current road segment name field 58.

When map 52 is at a scale above the threshold scale the current road segment 54 is accented or highlighted. Preferably, current road segment 54 is accented by displaying current road segment 54 in a first color wherein the first color is not one

of the rank colors, described above. Accenting could also comprise flashing current road segment 54 or changing its intensity. Preferably, first color comprises a magenta color. In addition, preferably the road segment name associated with current road segment 54 is displayed in current location field 62 in the first color.

- 5 Preferably the current location field 62 is displayed in a fixed location on display device 24 that is independent of the location of vehicle cursor 56 and current road segment 54.

- Figure 4 is display device 24 showing another embodiment of a vehicle location display 63 operating in the second mode when the scale exceeds a threshold scale. In Figure 4 vehicle location display 63 includes a map 64 comprised of a plurality of road segments 66, 68, 74, 76, and 86 including a current road segment 68. Preferably road segments 66 are displayed in their associated rank color. A vehicle cursor 70 is located on current road segment 68 at the current vehicle location as determined by the position determining system, described above.
- 15 The scale of map 64 as shown is above the threshold scale, and thus the road segment names are not displayed adjacent any of road segments 66. Map 64 includes a current location field 72 which displays the road segment name associated with current road segment 68. Preferably, current location field 72 is displayed in a fixed location on display device 24. Current road segment 68 is accented or
- 20 highlighted, preferably, by displaying current road segment 68 in the first color, described above, wherein the first color is not one of the rank colors. In addition, current road segment name is displayed in current location field 72 in the first color.

A previous cross street 74 and a next cross street 76, selected based on the database 28 and the current vehicle location, are also displayed on map 64. As used in this specification and the accompanying claims, a cross street is defined as a street that is connected to the current road segment 68 in any fashion or that crosses  
5 over or under the current road segment 68. In Figure 4, both the previous cross street 74 and the next cross street 76 are connected to the current road segment 68. A portion of both the previous cross street 74 and next cross street 76 are accented on map 64. Preferably, the portions of previous cross street 74 and next cross street 76 are accented by displaying them in a second color, wherein the second color is  
10 different from the first color and the rank colors. Most preferably the portions are displayed in a turquoise color. A current heading field 78 displays the current compass heading of the vehicle 32.

Map 64 further includes a map panning cursor 80. Through user input device 26 a user can pan map panning cursor 80 over map 64. Map panning  
15 cursor 80 includes a directional indicator 82 that points toward vehicle cursor 70 relative to map panning cursor 80. The directional indicator 82 is updated as the user pans over map 64. A distance field 84 shows the distance between the map panning cursor 80 and the current vehicle location. A user can select to have distance field 84 display the distance as either the straight line distance or the  
20 distance between map panning cursor 80 and the vehicle cursor 70 on a determined route. The map panning cursor 80 is more fully described in co-pending application Serial Number 09/100,683, filed June 19, 1998, which claims benefit of United States Provisional application Serial Number 60/084,294, filed May 5, 1998. Both

application Serial Number 09/100,683, filed June 19, 1998, and Provisional application Serial Number 60/084,294, filed May 5, 1998 are hereby incorporated in full by reference.

5 The CPU 22 continuously calculates the heading between the map panning cursor 80 and the vehicle cursor 70 using the latitude and longitude coordinates of each. In addition, the CPU 22 continuously calculates the distance between the map panning cursor 80 and the current vehicle location either on a straight line basis or on a determined route.

10 Based on the heading calculated between the map panning cursor 80 and the vehicle cursor 70, the CPU 22 indexes an array of pre-rendered bitmap symbols that define the position of the directional indicator 82 on the map panning cursor 80 and displays the bitmap symbol on map 64. Preferably, the array of pre-rendered bitmaps includes at least eight bitmaps one each for the compass headings of north, northeast, east, southeast, south, southwest, west and northwest. Thus, a heading  
15 of approximately  $315^\circ$  between the map panning cursor 80 and the vehicle cursor 70 is represented by a bitmap having the directional indicator 82 positioned as shown in Figure 4. When the heading changes, due to a change in the location of either the vehicle cursor 70 or the map panning cursor 80, the CPU 22 indexes the array and displays a new bitmap as appropriate.

20 Most preferably, each bitmap would correspond to a range of compass headings. By way of example, a heading between approximately  $337.5^\circ$  to  $22.5^\circ$  would correspond to a directional indicator positioned at a compass position of north on the map panning cursor 80. As would be understood by one of ordinary skill in



the art, the number of pre-rendered bitmaps could be much larger than the eight compass headings described above to provide higher resolution of the heading.

When map panning cursor 80 is panned over a road segment 66 that road segment becomes a panned road segment 86. Panned road segment 86 is accented  
5 on map 64. Preferably, panned road segment 86 is accented by displaying panned road segment 86 in a pan color, wherein the pan color is not the first color, second color or any of the rank colors. Preferably the panned color is a yellow. Map 64 further includes a panned road segment field 88. The road segment name associated with panned road segment 86 is displayed in panned road segment field 88,  
10 preferably in the pan color. Preferably the panned road segment field 88 is displayed in a fixed location adjacent current location field 72 independent of panned road segment 86 location.

Figure 5 shows display device 24 displaying another embodiment of a vehicle location display 90. Vehicle location display 90 includes a first map 92 having a  
15 variable first scale that displays a plurality of road segments 94 based on a current vehicle location and database 28. Road segments 94 are preferably displayed in the rank color associated with their rank. Vehicle location device 90 also includes a current heading field 96 which displays the current compass heading of vehicle 32.

20 When the first scale of first map 92 exceeds a threshold scale vehicle location device 90 displays in a second mode that includes a second map 98 displayed within first map 92. Thus, in Figure 5 the first scale of first map 92 is above the threshold scale. As would be understood by one of ordinary skill in the

art, second map 98 does not need to be displayed within first map 92. Second map 98 could be displayed adjacent first map 92. The second map 98 displays, at a lower scale, a portion of first map 92 including a current road segment 102. Generally, second map 98 moves around first map 92 as the current vehicle location changes so that a vehicle cursor 104 remains displayed in second map 98. Second map 98 includes a border 100 surrounding second map 98. Preferably, the color of border 100 is selected to contrast with the rank colors. Within second map 98 a plurality of road segments 94 are displayed, including the current road segment 102. Current road segment 102 also includes the vehicle cursor 104 located at the current vehicle location on current road segment 102. Adjacent road segments 94 and current road segment 102 in second map 98 are road segment name fields 106, which display the road segment names associated with each. The scale of second map 98 is below the threshold scale.

Most preferably, map scaler 23 enables a user to select from a plurality of scales to go from fully zoomed in to fully zoomed out. Preferably the threshold scale is set at the most zoomed in scale. As a user zooms out beyond the threshold scale vehicle location displays 50, 63, and 90 first stop displaying road segment names, then they stop displaying lower rank road segments, finally, at highest zoom out, only high ranking road segments are displayed in addition to the current, panned, and cross road segments.

The present invention has been described in accordance with the relevant legal standards, thus the foregoing description is exemplary rather than limiting in nature. Variations and modifications to the disclosed embodiment may become

apparent to those skilled in the art and do come within the scope of this invention. Accordingly, the scope of legal protection afforded this invention can only be determined by studying the following claims.

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# CLAIMS

We claim:

1. A vehicle location display of a navigation system comprising:  
5 a database of a plurality of road segments each having an associated road segment name;  
a display displaying a map at a variable scale, said map comprising a plurality of said road segments including a current road segment;  
said display displaying an associated road segment name adjacent said  
10 current road segment when said variable scale is below a threshold scale;  
said display displaying said associated road segment name of said current road segment in a current location field on said display not adjacent said current road segment when said variable scale is above said threshold scale.  
15
2. A vehicle location display of a navigation system as recited in Claim 1 further including a position determining system, said position determining system determining said current road segment and a current vehicle location on said current road segment; and  
20 said display displaying a vehicle cursor at said current vehicle location.

3. A vehicle location display of a navigation system as recited in Claim 1 further including a user input device; and

a map scaler, said map scaler changing said variable scale of said map in response to input from said user input device.

5

4. A vehicle location display of a navigation system as recited in Claim 1 wherein said current location field is in a fixed location on said display independent of the location of said current road segment on said display.

10

5. A vehicle location display of a navigation system as recited in Claim 1 wherein said display accents said current road segment when said variable scale is above said threshold scale.

15

6. A vehicle location display of a navigation system as recited in Claim 5 wherein accenting said current road segment includes displaying said current road segment in a first color different from the color of other road segments; and

20

said display displaying said associated road segment name of said current road segment in said current location field in said first color when said variable scale is above said threshold scale.

7. A vehicle location display of a navigation system as recited in Claim 6 further comprising:

said database including a plurality of ranks, each of said ranks associated with at least one of said road segments;

each of said ranks associated with one of a plurality of rank colors, none of said plurality of rank colors being said first color;

5           said display displaying each of said road segments except said current road segment of said map in an associated rank color.

8.       A vehicle location display of a navigation system as recited in Claim 1 further comprising:

10           a previous cross street and a next cross street of said current road segment;

          said display accenting a portion of said previous cross street and said next cross street.

15       9.       A vehicle location display of a navigation system as recited in Claim 8 wherein accenting said portion of said previous cross street and said next cross street includes displaying said portion of said previous cross street and said next cross street in a second color different from the color of other road segments.

20       10.      A vehicle location display of a navigation system as recited in Claim 1 further including a map panning cursor, said map panning cursor movable about said map in response to input from a user input device; and

said display accenting a panned road segment, said panned road segment selected with said map panning cursor.

5 11. A vehicle location display of a navigation system as recited in Claim 10 wherein accenting said panned road segment comprises displaying said panned road segment in a pan color different from the color of other road segments.

10 12. A vehicle location display of a navigation system as recited in Claim 10 wherein said display displays said road segment name associated with said panned road segment in a panned road segment field on said display in a pan color when said scale is above said threshold scale.

15 13. A vehicle location display of a navigation system as recited in Claim 10 wherein said map panning cursor includes a directional indicator, said directional indicator indicating a direction from said map panning cursor to a current vehicle location.

20 14. A vehicle location display of a navigation system as recited in Claim 10 wherein said display displays a distance field, said distance field displaying a distance between said map panning cursor and a current vehicle location.

15. A vehicle location display of a navigation system as recited in Claim 1 wherein said display further includes a current heading field, said current heading field displaying a current compass heading of a vehicle.



16. A vehicle location display of a navigation system comprising:

a database of a plurality of road segments;

a position determining system, said position determining system determining a current road segment and a current vehicle location on said current road segment;

a display displaying a first map at a first scale and comprising a plurality of said road segments including said current road segment;

said display displaying a second map and said first map, said second map comprising a plurality of said road segments including said current road segment, said second map having a second scale less than said first scale.

17. A vehicle location display of a navigation system as recited in Claim 16 further comprising:

a user input device; and

a map scaler, said map scaler changing said first scale of said first map in response to input from said user input device;

18. A vehicle location display of a navigation system as recited in Claim 16 wherein said display displays a road segment name adjacent said current road segment and a vehicle cursor at said current vehicle location on said first map when said first scale of said first map is below a threshold scale.

19. A vehicle location display of a navigation system as recited in Claim 16 wherein said display displays a road segment name adjacent said current road segment on said second map.

5 20. A vehicle location display of a navigation system as recited in Claim 16 wherein said display displays said second map within said first map.

21. A vehicle location display of a navigation system as recited in Claim 16 further comprising:

10 said database including a plurality of ranks, each of said ranks associated with at least one of said road segments;

each of said ranks associated with one of a plurality of rank colors;

said display displaying each of said road segments of said first map and said second map in an associated rank color.

15 22. A vehicle location display of a navigation system as recited in Claim 16 wherein said second map further includes a border, said border surrounding said second map and having a color other than said plurality of rank colors.

20 23. A vehicle location display of a navigation system as recited in Claim 16 wherein said display further includes a current heading field, said current heading field displaying a current compass heading of a vehicle.

24. A method for displaying a current vehicle location on a display of a navigation system comprising the steps of:

a.) determining a current vehicle location relative to a database of road segments;

5 b.) displaying a plurality of said road segments and said current vehicle location;

c.) adjusting a scale of said display; and

10 d.) displaying in a first mode when said scale is below a threshold scale and displaying in a second mode when said scale is above said threshold.

25. A method as recited in Claim 24 wherein:

step b.) further comprises displaying said plurality of said road segments and said current vehicle location on a map;

15 step c.) further comprises adjusting a scale of said map; and

20 step d.) further comprises in said first mode displaying a road segment name associated with said current vehicle location adjacent said current vehicle location and in said second mode displaying said road segment name associated with said current vehicle location in a current location field.

5

step c.) further comprises adjusting a scale of said first map; and

23

27. A vehicle location display of a navigation system comprising:  
a database of a plurality of road segments;  
a position determining system, said position determining system  
determining a current vehicle location relative to said database;

5 a display having a variable scale and displaying a plurality of said  
road segments and said current vehicle location in a first mode when said  
variable scale is below a threshold and displaying a plurality of said road  
segments and said current vehicle location in a second mode when said  
variable scale is above a threshold.

10

28. A vehicle location display of a navigation system as recited in Claim  
27 wherein said display displays a map including said plurality of said road  
segments and said current vehicle location;

15 in said first mode said display displays an associated road segment  
name adjacent said current vehicle location on said map; and

in said second mode said display displays said associated road  
segment name in a current location field on said display.

20 29. A vehicle location display of a navigation system as recited in Claim  
27 wherein:

said display displays a first map at said variable scale and including  
said plurality of said road segments and said current vehicle location when  
said display is in said first mode; and

said display displaying a second map and said first map when said display is in said second mode, said second map comprising a plurality of said road segments including said current road segment and a vehicle cursor displayed at said current vehicle location, said second map having a scale less than said threshold scale.

5

EX-1002-054-054

**ABSTRACT OF THE DISCLOSURE**

A vehicle location display for a navigation or route guidance system is disclosed. The vehicle location display provides information to a user regarding the current location of the vehicle on a map even when the scale of the map is large.

- 5 In a preferred embodiment, the map includes a current location field that displays a road segment name associated with the current road segment that the vehicle is located on. In an alternative embodiment, the vehicle location display displays a large scale map wherein the current road segment is highlighted by displaying it in a color and the name of the current road segment is displayed in a current location
- 10 field on the map.

00476630 102999  
00000000 00000000

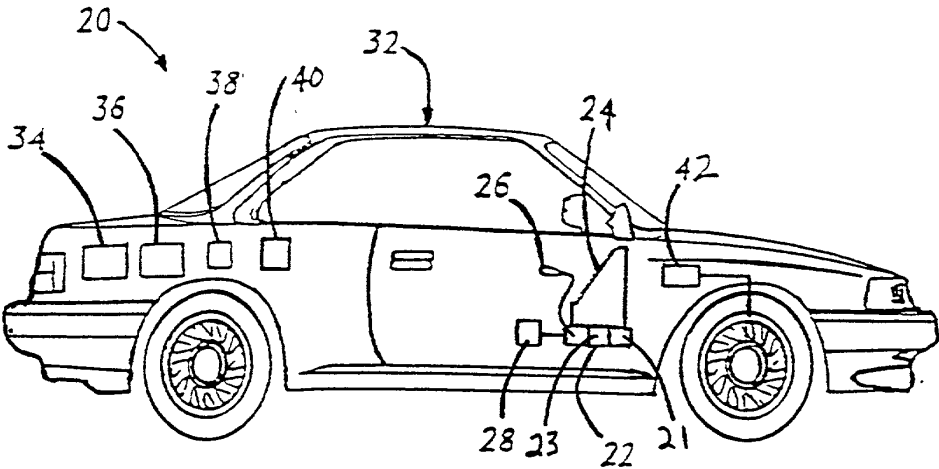


Fig. 1



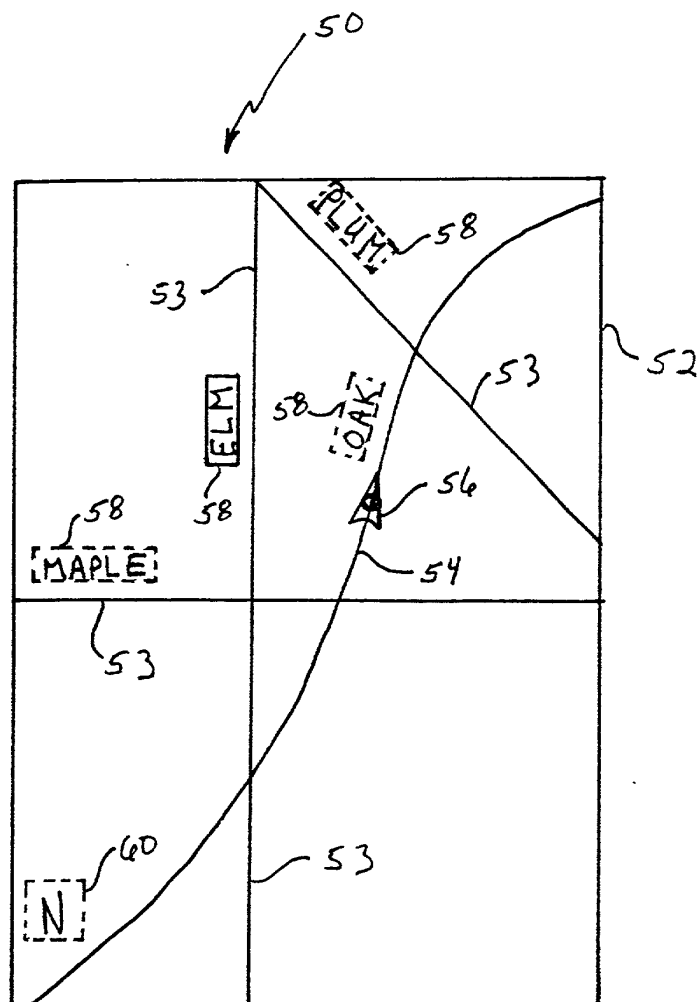


Fig. 2

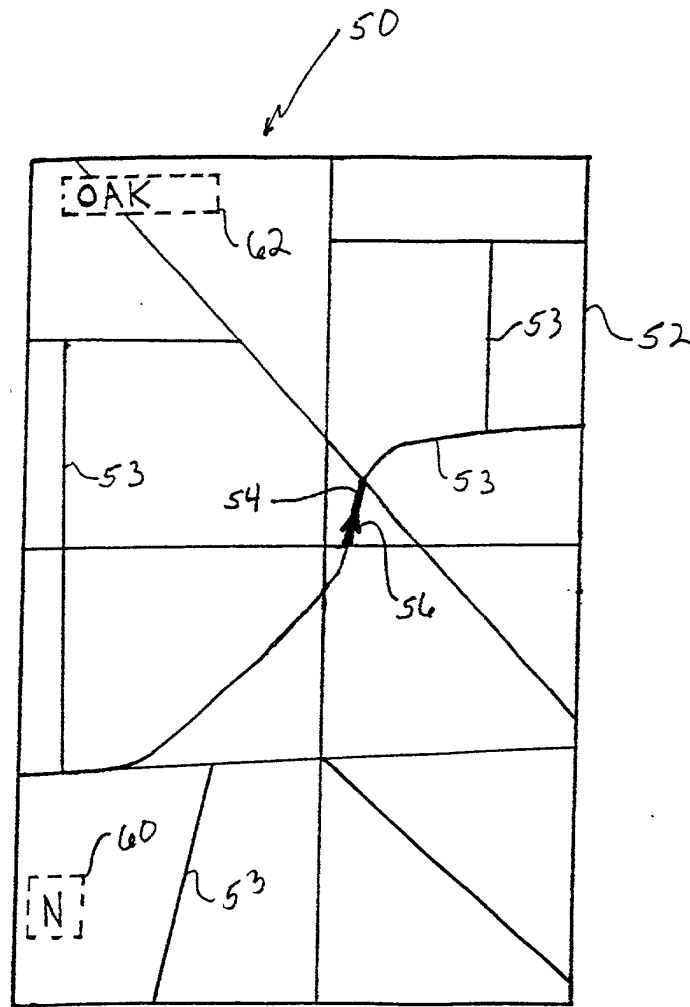


Fig.3

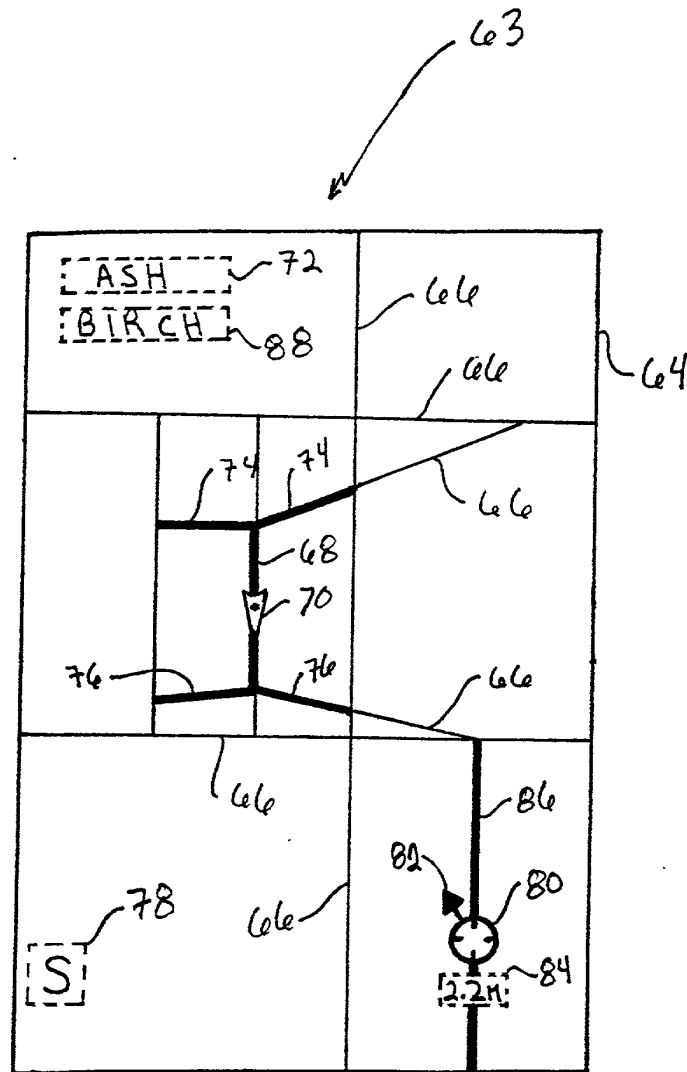
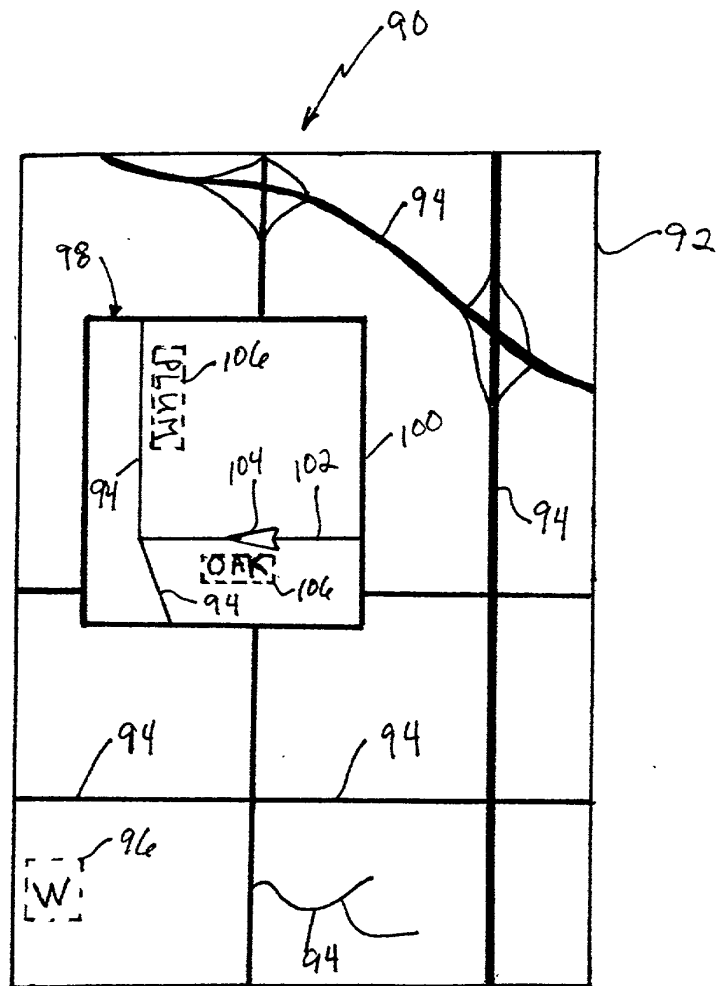


Fig. 4



**COMBINED DECLARATION AND POWER OF ATTORNEY  
(Original Application - Sole Inventor No Priority Claimed)**

As the below named inventor, I hereby declare: that my residence, post office address and citizenship are as stated near my name below; that I believe I am the original, first and sole inventor of the subject matter of which is claimed and for which a patent is sought on the invention entitled

**STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM**

which is described and claimed in the attached specification and amended by an amendment thereto submitted therewith (if any); that I have reviewed and understand the contents of this specification, including the claims, as amended by any amendment referred to above; that I do not know and do not believe the same was ever known or used in the United States of America before my invention thereof or patented or described in any printed publication, in any country before my invention thereof for more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to this application; that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve (12) months prior to this application; that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a); and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns except as follows: NONE.

I hereby appoint Raymond E. Scott, Registration No. 22,981; William H. Honaker, Registration No. 31,623; Theodore W. Olds, Registration No. 33,080; John E. Carlson, Registration No. 37,794; Harold W. Milton, Jr., Registration No. 22,180; David J. Gaskey, Registration No. 37,139; David R. Kurlandsky, Registration No. 41,505; Robin W. Asher, Registration No. P41,590; Samuel J. Haidle, Registration No. P42,619; Kerrie A. Laba, Registration No. P42,777; Randall L. Shoemaker, Registration No. 43,118; Eric L. Doyle, Registration No. P42,496 and Jeffrey A. Sadowski, Registration No. 29,005 as our attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith. Please address all correspondence and telephone calls to:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: 10/21/90

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0016530-102209

Case Docket No. 69-054

Date: October 22, 1998

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D. C. 20231

Sir:

Transmitted herewith for filing is a patent application of

Inventor:

For:

Enclosed are:

- ☒ 5 sheets of informal drawings.
- ☒ An Assignment of the invention to Magellan DIS, Inc.
- ☒ A certified copy of a \_\_\_\_\_ application.
- ☒ A Combined Declaration and Power of Attorney
- ☐ An associate power of attorney.
- ☐ A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27.
- ☐ PTO Form 1449 with copies of patents cited in specification.

The filing fee has been calculated as shown below:

	No. Filed	No. Extra	Small Entity		Large Entity	
Basic fee				\$395	X	\$790
Total Claims	29-20	9	X11	\$0	X22	\$198
Indep. Claims	4-3	1	X41	\$0	X82	\$82
Multiple Depend. Claim(s) Present						----

TOTAL TOTAL \$1070

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Respectfully submitted,

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*Irene M. Brown*  
Irene M. Brown

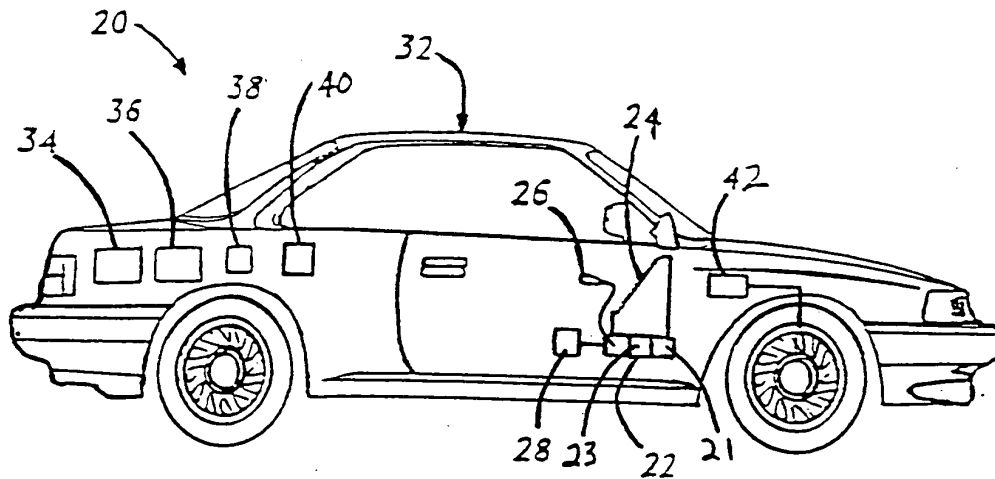
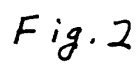


Fig. 1

5  
Fig.





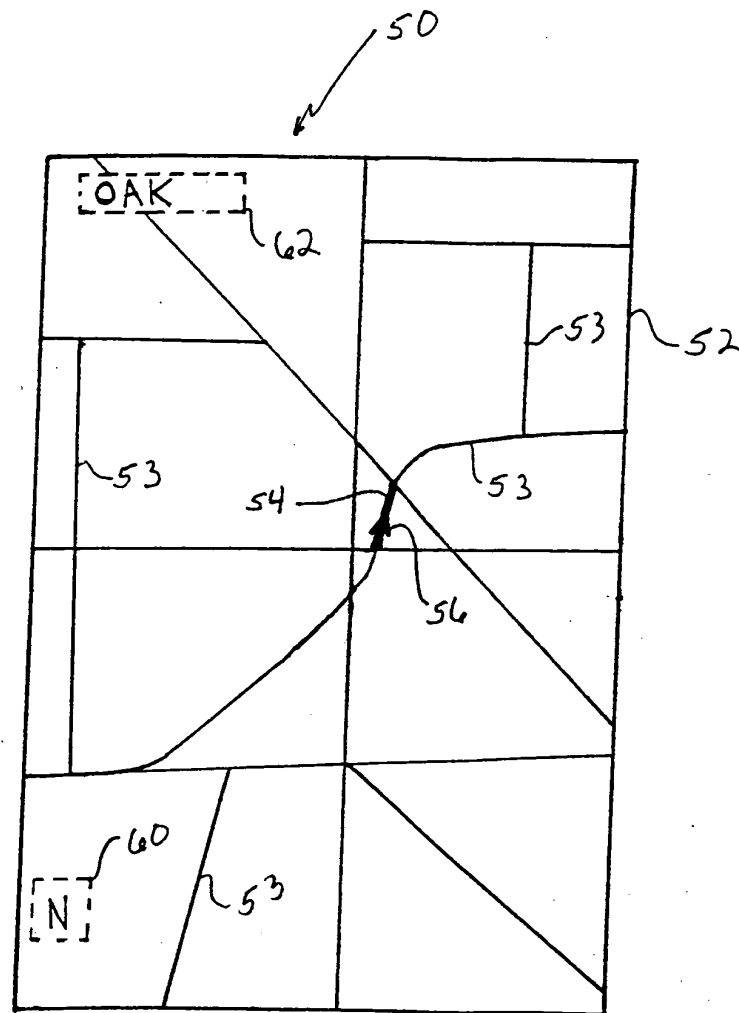


Fig.3

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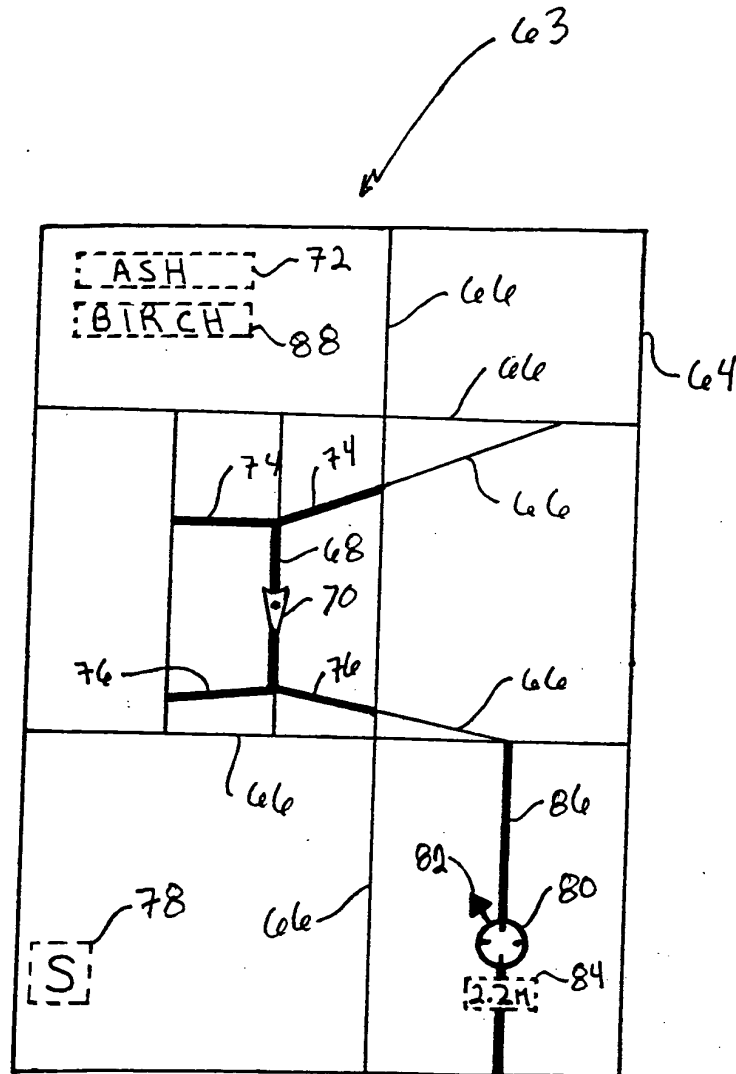


Fig. 4

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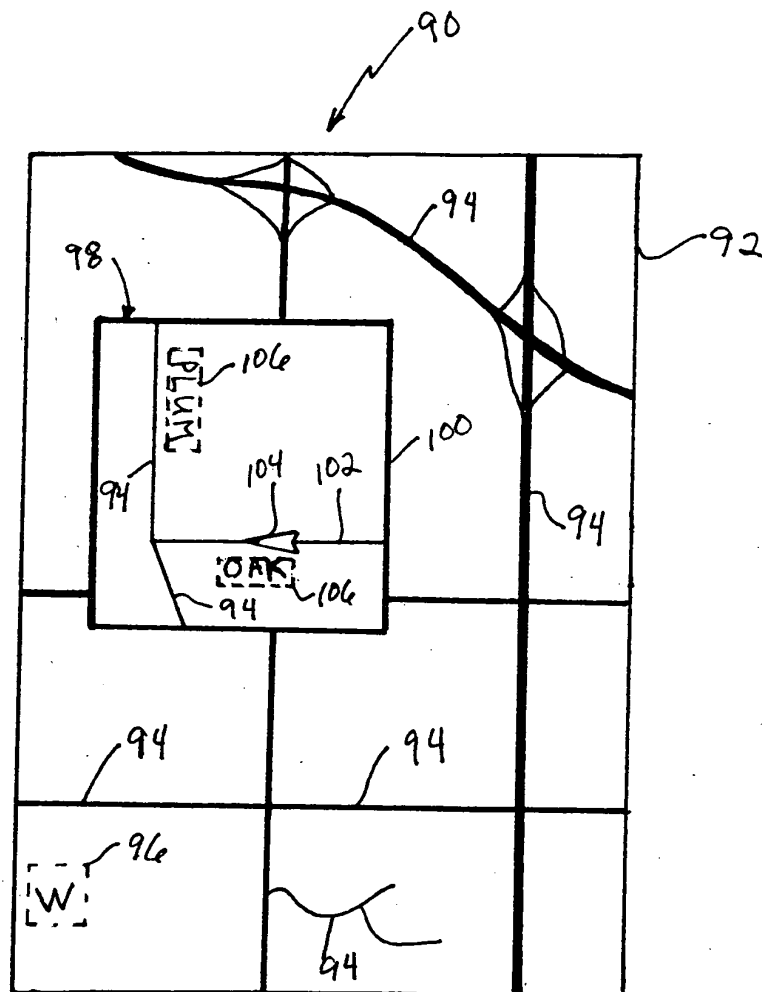


Fig. 5

## STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM

### BACKGROUND OF THE INVENTION

This invention relates generally to a navigation or route guidance system and,  
5 more particularly, to a vehicle location display for a route guidance system.

Navigation systems generally provide a recommended route from a starting  
point to a desired destination. Generally, the starting point and desired destination  
are selected from a large database of roads stored in a mass media storage, such as  
a CD ROM or hard drive, which includes the roads in the area to be travelled by  
10 the user. The navigation system can be located in a personal computer or it can be  
installed in a vehicle. If the navigation system is installed in a vehicle, the starting  
point is typically the current position of the vehicle, which can be input to the  
navigation system by an associated position determining system that usually includes  
a GPS (Global Positioning System) receiver.

15 The navigation system determines a route from the starting point to the  
destination utilizing an algorithm well-known to those in the art and currently in use  
in many navigation systems. Usually there are many potential routes between the  
selected starting point and the desired destination. Typical navigation systems select  
a recommended route based upon certain "cost" values associated with each segment  
20 of road in the road database. These cost values include the length of the road  
segment and the estimated time of travel through the road segment. The navigation  
system selects the potential route with the lowest total cost to be the recommended  
route. Depending upon the predetermined algorithm of the navigation system, the

navigation system will recommend the route with the shortest total length, the lowest total time, or some weighted average of length and time.

The recommended route is then displayed to the user as a map showing the starting point, desired destination and highlighting the recommended route.

- 5 Preferably, if the navigation system is installed in a vehicle, the navigation system displays the current location of the vehicle and provides turn-by-turn instructions to the driver, guiding the driver to the selected destination.

10 The typical navigation system provides the current vehicle location to the user by displaying either a textual guidance mode screen having a set of instructions and the current location or a guidance mode map showing the starting point, desired destination, current location and highlighting the recommended route. When a user has not determined a route, the typical navigation system displays a map showing the current vehicle location and all of the surrounding streets. Such a system is described in <sup>Patent</sup> ~~co-pending application~~ Serial Number <sup>6,049,755</sup> ~~09/114,670~~ filed July 13, 1998, which claims benefit of provisional application Serial Number 60/084,292, filed 15 May 5, 1998. The disclosures of <sup>Patent</sup> ~~Serial~~ Number <sup>6,049,755</sup> ~~09/114,670~~ and 60/084,292 referenced above are hereby incorporated by reference in full.

20 The typical navigation system also permits a user to adjust the scale of a displayed map. Frequently a user desires to "zoom out" by increasing the map scale to enable the user to see a larger area of the database. One disadvantage of current map zoom functions is that when a user zooms out it can be difficult, because of the complexity of a larger scale map, to see the current vehicle location on the large scale map. Also, in a current navigation system when a smaller scale map is

The typical navigation system also permits a user to pan the map to areas other than the current location. One disadvantage when panning a large scale map is that the user is not provided with a street name of a panned street.

Thus, it is desirable to provide a vehicle location display for a navigation system that permits a user to alter the scale of a displayed map to a large scale while still providing the user with information concerning the current vehicle location. In addition, it is desirable to provide information to a user regarding a planned street when the scale of a displayed map is large.

In general terms, this invention provides a vehicle location display for a navigation system.

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In a preferred embodiment the vehicle location display accents the current road segment and the associated road segment name when the variable scale is above the threshold scale by displaying them in a first color on the display. In a most preferred embodiment the vehicle location display includes a map scaler that  
5 adjusts the scale of the map in response to input from a user input device.

These and other features and advantages of this invention will become more apparent to those skilled in the art from the following detailed description of the presently preferred embodiment. The drawings that accompany the detailed description can be described as follows.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic of a navigation system with a vehicle location display designed according to the present invention installed in a vehicle;

Figure 2 is a screen display of one embodiment of the vehicle location display illustrating a map having a scale below a threshold scale;

Figure 3 is a screen display of the vehicle location display shown in Figure 2 when the map has a scale above the threshold scale;

Figure 4 is a screen display of another embodiment of the vehicle location display illustrating a map having a scale above the threshold scale; and



Figure 5 is a screen display of another embodiment of the vehicle location display illustrating a second map within a first map when the first map has a scale above the threshold scale.

## 5      DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The navigation system 20 of the present invention is shown schematically in Figure 1. The navigation system 20 includes a CPU 22 (Central Processing Unit) having a route determination system 21 and a map scaler 23. Preferably, the route determination system 21 and the map scaler 23 are implemented in software on the CPU 22. The CPU 22 is connected to a display device 24, such as a high resolution LCD or flat panel display. The CPU 22 is also connected to a user input device 26. The navigation system 20 further includes a database 28 connected to the CPU 22. The database 28 is a mass media storage device, such as a CD ROM or hard drive, which includes data of all the roads in the area to be travelled by the user. The navigation system 20 can display a map on display device 24 based on the data in the database 28. The scale of the map, for example 1:265,000, is a variable scale that can be altered by a user through the user input device 26 and the map scaler 23.

Each road in the database is divided into road segments, each having an associated set of cost values, which indicate the "cost" of traveling that road segment. For example, the cost values may include the length of the road segment, the estimated time to travel the road segment, and the type of road (i.e., highway, secondary road, toll road, one way, etc.). Each road segment also has a road

segment name associated with it. Generally, each road segment comprises the portion of a road between adjacent cross roads to the road.

Using algorithms well known in the art, route determination system 21 determines a route on the road segments from a beginning point to a user selected destination point. Preferably, the beginning point is the current vehicle location as determined by the CPU 22 and one of the position determining devices discussed below. The determined route is preferably based on the cost values. Preferably, the navigation system 20 displays the determined route on display device 24 and provides turn by turn instructions to the user.

Each road segment in the database 28 has a rank associated with it. The rank, for example, may be a number from zero to four, with four being the highest rank. The rank of a road segment is determined by a number of factors including: road geometry, such as the number of lanes; speed limit of the road segment; and type of road segment, such as freeway, primary street or subdivision street. Generally, the rank divides road segments from highest rank to lowest rank into a freeway, a primary street, a secondary street, and a subdivision street with a freeway being the highest rank. The rank of a given road segment can not be altered by a user. The CPU 22 associates a unique rank color with each of the ranks. The display device displays each road segment in its associated rank color. Thus, for example, a highway, which has the highest rank may have a rank color of red and a subdivision street, which has the lowest rank may have a rank color of gray.

The navigation system 20 can, but need not, be installed in a vehicle 32. The navigation system can be used in conjunction with position determining devices, such as a GPS receiver 34, a gyroscope 36, a compass 38, an orthogonal multi-axis accelerometer 40 and a vehicle speed sensor 42, all connected to the CPU 22 (connections not shown for simplicity). Such position determining devices are well-known and are commercially available. Preferably, a combination of these position determining devices is utilized. Using known software algorithms and technologies, such as dead-reckoning or map-matching or others, the CPU 22 in combination with the position determining device comprises a position determining system that determines the current position of the navigation system 20 or the vehicle 32 relative to the map database 28. The current position determination includes a determination of a current road segment and a current vehicle location on the current road segment.

Figure 2 is a screen display of one embodiment of a vehicle location display shown generally at 50. Vehicle location display 50 includes a map 52 displayed on display device 24. Map 52 is comprised of a plurality of road segments 53 and includes a current road segment 54, which is determined by the position determining system, described above. A vehicle cursor 56 is located at a current vehicle location, also determined by the position determining system, on current road segment 54. A road segment name field 58, shown in phantom, is located adjacent at least one road segment 53 of each road including current road segment 54. A road segment name associated with the adjacent road segment 53 is displayed in each road segment name field 58. Vehicle location display 50 also includes a

current heading field 60, shown in phantom, that displays a current compass heading of vehicle 32. As discussed above, map 52 is comprised of a plurality of road segments 53, generally each road segment 53 comprises the portion of a road between adjacent cross roads of that road. If there is a long distance between cross roads, then a road segment may be a portion of a road that is not defined by cross roads. Preferably each road segment 53, and the current road segment 54 are displayed in their associated rank color, described above. In Figure 2 the scale of map 52 is below a threshold scale, thus vehicle location display 50 operates in a first mode and map 52 displays associated names in the road segment name fields 58. The threshold scale is preferably set at a scale that displays a map 52 that is not overly complex or detailed and represents a fully zoomed in view.

In Figure 3 vehicle location display 50 is shown when the scale of map 52 is above the threshold scale, in other words, the user has zoomed out. The scale of map 52 is variable and can be adjusted through user input device 26 and map scaler 23. When the scale of map 52 exceeds the threshold scale vehicle location display 50 operates in a second mode and further includes a current location field 62. Current location field 62 displays the road segment name associated with current road segment 54. Preferably, when the variable scale exceeds the threshold scale map 52 no longer displays the associated names in the current road segment name field 58.

When map 52 is at a scale above the threshold scale the current road segment 54 is accented or highlighted. Preferably, current road segment 54 is accented by displaying current road segment 54 in a first color wherein the first color is not one

of the rank colors, described above. Accenting could also comprise flashing current road segment 54 or changing its intensity. Preferably, first color comprises a magenta color. In addition, preferably the road segment name associated with current road segment 54 is displayed in current location field 62 in the first color.

- 5 Preferably the current location field 62 is displayed in a fixed location on display device 24 that is independent of the location of vehicle cursor 56 and current road segment 54.

- Figure 4 is display device 24 showing another embodiment of a vehicle location display 63 operating in the second mode when the scale exceeds a threshold
- 10 scale. In Figure 4 vehicle location display 63 includes a map 64 comprised of a plurality of road segments 66, 68, 74, 76, and 86 including a current road segment 68. Preferably road segments 66 are displayed in their associated rank color. A vehicle cursor 70 is located on current road segment 68 at the current vehicle location as determined by the position determining system, described above.
- 15 The scale of map 64 as shown is above the threshold scale, and thus the road segment names are not displayed adjacent any of road segments 66. Map 64 includes a current location field 72 which displays the road segment name associated with current road segment 68. Preferably, current location field 72 is displayed in a fixed location on display device 24. Current road segment 68 is accented or
- 20 highlighted, preferably, by displaying current road segment 68 in the first color, described above, wherein the first color is not one of the rank colors. In addition, current road segment name is displayed in current location field 72 in the first color.

A previous cross street 74 and a next cross street 76, selected based on the database 28 and the current vehicle location, are also displayed on map 64. As used in this specification and the accompanying claims, a cross street is defined as a street that is connected to the current road segment 68 in any fashion or that crosses over or under the current road segment 68. In Figure 4, both the previous cross street 74 and the next cross street 76 are connected to the current road segment 68. A portion of both the previous cross street 74 and next cross street 76 are accented on map 64. Preferably, the portions of previous cross street 74 and next cross street 76 are accented by displaying them in a second color, wherein the second color is different from the first color and the rank colors. Most preferably the portions are displayed in a turquoise color. A current heading field 78 displays the current compass heading of the vehicle 32.

Map 64 further includes a map panning cursor 80. Through user input device 26 a user can pan map panning cursor 80 over map 64. Map panning cursor 80 includes a directional indicator 82 that points toward vehicle cursor 70 relative to map panning cursor 80. The directional indicator 82 is updated as the user pans over map 64. A distance field 84 shows the distance between the map panning cursor 80 and the current vehicle location. A user can select to have distance field 84 display the distance as either the straight line distance or the distance between map panning cursor 80 and the vehicle cursor 70 on a determined route. The map panning cursor 80 is more fully described in co-pending application Serial Number 09/100,683, <sup>allowed</sup> filed June 19, 1998, which claims benefit of United States Provisional application Serial Number 60/084,294, filed May 5, 1998. Both

application Serial Number 09/100,683, filed June 19, 1998, and Provisional application Serial Number 60/084,294, filed May 5, 1998 are hereby incorporated in full by reference.

5 The CPU 22 continuously calculates the heading between the map panning cursor 80 and the vehicle cursor 70 using the latitude and longitude coordinates of each. In addition, the CPU 22 continuously calculates the distance between the map panning cursor 80 and the current vehicle location either on a straight line basis or on a determined route.

10 Based on the heading calculated between the map panning cursor 80 and the vehicle cursor 70, the CPU 22 indexes an array of pre-rendered bitmap symbols that define the position of the directional indicator 82 on the map panning cursor 80 and displays the bitmap symbol on map 64. Preferably, the array of pre-rendered bitmaps includes at least eight bitmaps one each for the compass headings of north, northeast, east, southeast, south, southwest, west and northwest. Thus, a heading  
15 of approximately  $315^\circ$  between the map panning cursor 80 and the vehicle cursor 70 is represented by a bitmap having the directional indicator 82 positioned as shown in Figure 4. When the heading changes, due to a change in the location of either the vehicle cursor 70 or the map panning cursor 80, the CPU 22 indexes the array and displays a new bitmap as appropriate.

20 Most preferably, each bitmap would correspond to a range of compass headings. By way of example, a heading between approximately  $337.5^\circ$  to  $22.5^\circ$  would correspond to a directional indicator positioned at a compass position of north on the map panning cursor 80. As would be understood by one of ordinary skill in

the art, the number of pre-rendered bitmaps could be much larger than the eight compass headings described above to provide higher resolution of the heading.

When map panning cursor 80 is panned over a road segment 66 that road segment becomes a panned road segment 86. Panned road segment 86 is accented on map 64. Preferably, panned road segment 86 is accented by displaying panned road segment 86 in a pan color, wherein the pan color is not the first color, second color or any of the rank colors. Preferably the panned color is a yellow. Map 64 further includes a panned road segment field 88. The road segment name associated with panned road segment 86 is displayed in panned road segment field 88, preferably in the pan color. Preferably the panned road segment field 88 is displayed in a fixed location adjacent current location field 72 independent of panned road segment 86 location.

Figure 5 shows display device 24 displaying another embodiment of a vehicle location display 90. Vehicle location display 90 includes a first map 92 having a variable first scale that displays a plurality of road segments 94 based on a current vehicle location and database 28. Road segments 94 are preferably displayed in the rank color associated with their rank. Vehicle location device 90 also includes a current heading field 96 which displays the current compass heading of vehicle 32.

When the first scale of first map 92 exceeds a threshold scale vehicle location device 90 displays in a second mode that includes a second map 98 displayed within first map 92. Thus, in Figure 5 the first scale of first map 92 is above the threshold scale. As would be understood by one of ordinary skill in the



art, second map 98 does not need to be displayed within first map 92. Second map 98 could be displayed adjacent first map 92. The second map 98 displays, at a lower scale, a portion of first map 92 including a current road segment 102. Generally, second map 98 moves around first map 92 as the current vehicle location changes so that a vehicle cursor 104 remains displayed in second map 98. Second map 98 includes a border 100 surrounding second map 98. Preferably, the color of border 100 is selected to contrast with the rank colors. Within second map 98 a plurality of road segments 94 are displayed, including the current road segment 102. Current road segment 102 also includes the vehicle cursor 104 located at the current vehicle location on current road segment 102. Adjacent road segments 94 and current road segment 102 in second map 98 are road segment name fields 106, which display the road segment names associated with each. The scale of second map 98 is below the threshold scale.

Most preferably, map scaler 23 enables a user to select from a plurality of scales to go from fully zoomed in to fully zoomed out. Preferably the threshold scale is set at the most zoomed in scale. As a user zooms out beyond the threshold scale vehicle location displays 50, 63, and 90 first stop displaying road segment names, then they stop displaying lower rank road segments, finally, at highest zoom out, only high ranking road segments are displayed in addition to the current, panned, and cross road segments.

The present invention has been described in accordance with the relevant legal standards, thus the foregoing description is exemplary rather than limiting in nature. Variations and modifications to the disclosed embodiment may become

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CLAIMS

We claim:

1. A vehicle location display of a navigation system comprising:

5 a database of a plurality of road segments each having an associated road segment name;

a display displaying a map at a variable scale, said map comprising a plurality of said road segments including a current road segment;

10 said display displaying an associated road segment name adjacent said current road segment when said variable scale is below a threshold scale;

said display displaying said associated road segment name of said current road segment in a current location field on said display not adjacent said current road segment when said variable scale is above said threshold scale.

15

2. A vehicle location display of a navigation system as recited in Claim 1 further including a position determining system, said position determining system determining said current road segment and a current vehicle location on said current road segment; and

20 said display displaying a vehicle cursor at said current vehicle location.

3. A vehicle location display of a navigation system as recited in Claim 1 further including a user input device; and

a map scaler, said map scaler changing said variable scale of said map in response to input from said user input device.

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4. A vehicle location display of a navigation system as recited in Claim 1 wherein said current location field is in a fixed location on said display independent of the location of said current road segment on said display.

10

5. A vehicle location display of a navigation system as recited in Claim 1 wherein said display accents said current road segment when said variable scale is above said threshold scale.

15

6. A vehicle location display of a navigation system as recited in Claim 5 wherein accenting said current road segment includes displaying said current road segment in a first color different from the color of other road segments; and

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said display displaying said associated road segment name of said current road segment in said current location field in said first color when said variable scale is above said threshold scale.

7. A vehicle location display of a navigation system as recited in Claim 6 further comprising:

said database including a plurality of ranks, each of said ranks associated with at least one of said road segments;

each of said ranks associated with one of a plurality of rank colors, none of said plurality of rank colors being said first color;

5           said display displaying each of said road segments except said current road segment of said map in an associated rank color.

8.       A vehicle location display of a navigation system as recited in Claim 1 further comprising:

10           a previous cross street and a next cross street of said current road segment;

          said display accenting a portion of said previous cross street and said next cross street.

15       9.       A vehicle location display of a navigation system as recited in Claim 8 wherein accenting said portion of said previous cross street and said next cross street includes displaying said portion of said previous cross street and said next cross street in a second color different from the color of other road segments.

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10.       A vehicle location display of a navigation system as recited in Claim 1 further including a map panning cursor, said map panning cursor movable about said map in response to input from a user input device; and

said display accenting a panned road segment, said panned road segment selected with said map panning cursor.

11. A vehicle location display of a navigation system as recited in Claim 10 wherein accenting said panned road segment comprises displaying said panned road segment in a pan color different from the color of other road segments.

12. A vehicle location display of a navigation system as recited in Claim 10 wherein said display displays said road segment name associated with said panned road segment in a panned road segment field on said display in a pan color when said scale is above said threshold scale.

13. A vehicle location display of a navigation system as recited in Claim 10 wherein said map panning cursor includes a directional indicator, said directional indicator indicating a direction from said map panning cursor to a current vehicle location.

14. A vehicle location display of a navigation system as recited in Claim 10 wherein said display displays a distance field, said distance field displaying a distance between said map panning cursor and a current vehicle location.

15. A vehicle location display of a navigation system as recited in Claim 1 wherein said display further includes a current heading field, said current heading field displaying a current compass heading of a vehicle.

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A vehicle location display of a navigation system comprising:

a database of a plurality of road segments;

a position determining system, said position determining system determining a current road segment and a current vehicle location on said current road segment;

a display displaying a first map at a first scale and comprising a plurality of said road segments including said current road segment;

a said display displaying a second map and said first map, said second map comprising a plurality of said road segments including said current road segment, said second map having a second scale less than said first scale.

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A vehicle location display of a navigation system as recited in Claim

further comprising:

a user input device; and

a map scaler, said map scaler changing said first scale of said first map in response to input from said user input device;

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A vehicle location display of a navigation system as recited in Claim

wherein said display displays a road segment name adjacent said current road segment and a vehicle cursor at said current vehicle location on said first map when said first scale of said first map is below a threshold scale.



<sup>21</sup>  
~~19~~  
<sup>18</sup>  
~~16~~ A vehicle location display of a navigation system as recited in Claim wherein said display displays a road segment name adjacent said current road segment on said second map.

5 <sup>22</sup>  
~~20~~  
<sup>18</sup>  
~~16~~ A vehicle location display of a navigation system as recited in Claim wherein said display displays said second map within said first map.

<sup>23</sup>  
~~21~~  
<sup>18</sup>  
~~16~~ A vehicle location display of a navigation system as recited in Claim further comprising:

10 said database including a plurality of ranks, each of said ranks associated with at least one of said road segments;

each of said ranks associated with one of a plurality of rank colors;

said display displaying each of said road segments of said first map and said second map in an associated rank color.

15 <sup>24</sup>  
~~22~~  
<sup>18</sup>  
~~16~~ A vehicle location display of a navigation system as recited in Claim wherein said second map further includes a border, said border surrounding said second map and having a color other than said plurality of rank colors.

20 <sup>25</sup>  
~~23~~  
<sup>18</sup>  
~~16~~ A vehicle location display of a navigation system as recited in Claim wherein said display further includes a current heading field, said current heading field displaying a current compass heading of a vehicle.

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<sup>26</sup>  
~~24~~

A method for displaying a current vehicle location on a display of a navigation system comprising the steps of:

a.) determining a current vehicle location relative to a database of road segments;

5 b.) displaying a plurality of said road segments and said current vehicle location;

c.) adjusting a scale of said display; and

10 d.) displaying in a first mode when said scale is below a threshold scale and displaying in a second mode when said scale is above said threshold.

<sup>27</sup>  
~~25~~

<sup>26</sup>

A method as recited in Claim ~~24~~<sup>26</sup> wherein:

step b.) further comprises displaying said plurality of said road segments and said current vehicle location on a map;

15 step c.) further comprises adjusting a scale of said map; and

20 step d.) further comprises in said first mode displaying a road segment name associated with said current vehicle location adjacent said current vehicle location and in said second mode displaying said road segment name associated with said current vehicle location in a current location field.

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<sup>28</sup>  
26. A method as recited in Claim <sup>26</sup>24 wherein:

step b.) further comprises displaying said plurality of said road segments and said current vehicle location on a first map;

step c.) further comprises adjusting a scale of said first map; and

5 step d.) further comprises in said first mode displaying on said first map said current vehicle location and in said second mode displaying said first map and a second map, said second map having a scale below said threshold and including said current vehicle location.

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27.

A vehicle location display of a navigation system comprising:

a database of a plurality of road segments;

a position determining system, said position determining system determining a current vehicle location relative to said database;

5 a display having a variable scale and displaying a plurality of said road segments and said current vehicle location in a first mode when said variable scale is below a threshold and displaying a plurality of said road segments and said current vehicle location in a second mode when said variable scale is above a threshold.

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A vehicle location display of a navigation system as recited in Claim

27 wherein said display displays a map including said plurality of said road segments and said current vehicle location;

15 in said first mode said display displays an associated road segment name adjacent said current vehicle location on said map; and

in said second mode said display displays said associated road segment name in a current location field on said display.

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A vehicle location display of a navigation system as recited in Claim

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27 wherein:

said display displays a first map at said variable scale and including said plurality of said road segments and said current vehicle location when said display is in said first mode; and

09176630-102298

said display displaying a second map and said first map when said display is in said second mode, said second map comprising a plurality of said road segments including said current road segment and a vehicle cursor displayed at said current vehicle location, said second map having a scale less than said threshold scale.

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*add a'*

**ABSTRACT OF THE DISCLOSURE**

A vehicle location display for a navigation or route guidance system is disclosed. The vehicle location display provides information to a user regarding the current location of the vehicle on a map even when the scale of the map is large.

- 5 In a preferred embodiment, the map includes a current location field that displays a road segment name associated with the current road segment that the vehicle is located on. In an alternative embodiment, the vehicle location display displays a large scale map wherein the current road segment is highlighted by displaying it in a color and the name of the current road segment is displayed in a current location  
10 field on the map.

09176630-102299

**COMBINED DECLARATION AND POWER OF ATTORNEY  
(Original Application - Sole Inventor No Priority Claimed)**

As the below named inventor, I hereby declare: that my residence, post office address and citizenship are as stated near my name below; that I believe I am the original, first and sole inventor of the subject matter of which is claimed and for which a patent is sought on the invention entitled

**STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM**

which is described and claimed in the attached specification and amended by an amendment thereto submitted therewith (if any); that I have reviewed and understand the contents of this specification, including the claims, as amended by any amendment referred to above; that I do not know and do not believe the same was ever known or used in the United States of America before my invention thereof or patented or described in any printed publication, in any country before my invention thereof for more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to this application; that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve (12) months prior to this application; that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a); and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns except as follows: NONE.

I hereby appoint Raymond E. Scott, Registration No. 22,981; William H. Honaker, Registration No. 31,623; Theodore W. Olds, Registration No. 33,080; John E. Carlson, Registration No. 37,794; Harold W. Milton, Jr., Registration No. 22,180; David J. Gaskey, Registration No. 37,139; David R. Kurlandsky, Registration No. 41,505; Robin W. Asher, Registration No. P41,590; Samuel J. Haidle, Registration No. P42,619; Kerrie A. Laba, Registration No. P42,777; Randall L. Shoemaker, Registration No. 43,118; Eric L. Doyle, Registration No. P42,496 and Jeffrey A. Sadowski, Registration No. 29,005 as our attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith. Please address all correspondence and telephone calls to:

**JOHN E. CARLSON, ESQ.  
HOWARD & HOWARD  
1400 North Woodward Avenue, Suite 101  
Bloomfield Hills, Michigan 48304-2856  
(810) 645-1483**

00175530 102299

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: 10/21/90

Jeffrey Alan Millington  
Name: Jeffrey Alan Millington

Post Office and  
Residence Address:

3390 Greenwood Drive  
Rochester Hills, Michigan 48309

Citizenship:

United States

00175630-102208



SERIAL NUMBER 09/176,630	FILING DATE 10/22/98	CLASS 701	GROUP ART UNIT 3614	ATTORNEY DOCKET NO. 60.314-054
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APPLICANT

JEFFREY ALAN MILLINGTON, ROCHESTER HILLS, MI.

**\*\*CONTINUING DOMESTIC DATA\*\*\*\*\***  
VERIFIED ISC  
none

**\*\*371 (NAT'L STAGE) DATA\*\*\*\*\***  
VERIFIED ISC  
none

**\*\*FOREIGN APPLICATIONS\*\*\*\*\***  
VERIFIED ISC  
none

FOREIGN FILING LICENSE GRANTED 11/10/98

Foreign Priority claimed 35 USC 119 (a-d) conditions met	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	Met after Allowance	STATE OR COUNTRY MI	SHEETS DRAWING 5	TOTAL CLAIMS 29	INDEPENDENT CLAIMS 4
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Verified and Acknowledged ISC  
Examiner's Initials \_\_\_\_\_ Initials \_\_\_\_\_

ADDRESS

~~RANDALL L SHOEMAKER~~  
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~~BLOOMFIELD HILLS MI 48304-2856~~

CARLSON, GASKEY & OLDS  
400 W. MAPLE ROAD  
Suite 350  
BIRMINGHAM, Michigan 48009

TITLE

STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM

FILING FEE RECEIVED  \$1,070	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT NO. _____ for the following:	<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit
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PATENT APPLICATION SERIAL NO. 09/176630

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE  
FEE RECORD SHEET

0/27/1998 JWSHNG 00000014 09176630

01 FE:101	790.00 00
02 FE:102	82.00 00
03 FE:103	198.00 00

PTO-1556  
(5/87)

U.S. GPO: 1998-433-214/80404

# PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 1997

Application or Docket Number

176630

## CLAIMS AS FILED - PART I

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	29 minus 20 = *	9
INDEPENDENT CLAIMS	4 minus 3 = *	1
MULTIPLE DEPENDENT CLAIM PRESENT		

\* If the difference in column 1 is less than zero, enter "0" in column 2

## SMALL ENTITY TYPE ☐

OR

## OTHER THAN SMALL ENTITY

RATE	FEE	RATE	FEE
	395.00		790.00
x\$11=		x\$22=	198. <sup>00</sup>
x41=		x82=	82. <sup>00</sup>
+135=		+270=	
TOTAL		TOTAL	1070. <sup>00</sup>

## CLAIMS AS AMENDED - PART II

(Column 1)

(Column 2)

(Column 3)

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total * 31	Minus ** 29	= 2
	Independent * 4	Minus *** 4	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM		

## SMALL ENTITY

OR

## OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
x\$11=		x\$22=	36
x41=		x82=	
+135=		+270=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	36

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total *	Minus **	=
	Independent *	Minus ***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM		

RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
x\$11=		x\$22=	
x41=		x82=	
+135=		+270=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total *	Minus **	=
	Independent *	Minus ***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM		

RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
x\$11=		x\$22=	
x41=		x82=	
+135=		+270=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.



SEARCHED			
Class	Sub.	Date	Exmr.
701	25	6/22	Koko
	201	23	
	208*		
	211*		
	212*		
340	990*		
	995*		
updated		6/22/00	Koko

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	Date	Exmr.

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
701	208 211 212	8/23/00	K. B. O.
340	990 995	✓	✓

EX1002 / Page 73 of 251

ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	<i>Rad</i>	75331	
O.I.P.E. CLASSIFIER		10	11-2-98
FORMALITY REVIEW		69989	NOV 10 1998

### INDEX OF CLAIMS

✓ Rejected N Non-elected  
 - Allowed I Interference  
 (Through numeral) Canceled A Appeal  
 + Restricted O Objected

Claim	Final	Original	Date
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If more than 150 claims or 10 actions  
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GPM 3614

366/



Case Docket No. 60,314-054

Date: January 5, 1999

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

#2

In application of: Millington

IDS w/attd  
1/15/99

Serial No.: 09/176,630

Group Art Unit: 3614

Filed: October 22, 1998

For: STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM

RECEIVED  
JAN 13 AM 9:34  
FEDERAL BUREAU OF INVESTIGATION

**INFORMATION DISCLOSURE STATEMENT**  
**UNDER 37 CFR 1.97 AND 1.98**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

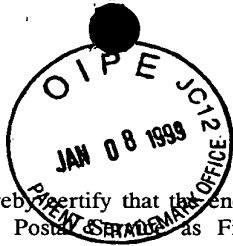
Provided herewith are copies of patents and publications as listed in the attached form PTO-1449. None of these references discloses the invention claimed in the subject application.

It is believed that this information disclosure statement is being filed before the mailing date of the first office action on the merits of this application, thus no fee is required. To the extent that a fee is required, the Commissioner is hereby authorized to charge any fee or credit to Deposit Account No. 08-2789.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS, P.C.

Randall L. Shoemaker  
Registration No. 43,118  
1400 North Woodward Ave.  
Suite 101  
Bloomfield Hills, MI 48304  
(248) 645-1483



CERTIFICATE OF MAIL

I hereby certify that the enclosed **IDS, PTO Form-1449 and a reference** are being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Assistant Commissioner of Patents, Washington D.C. 20231 on this 5th day of January, 1999

  
Irene M. Brown





2. Kindly advise the undersigned of the present status of this application.

*Note: Status Inquiries should not be submitted for:  
NEW applications until a reasonable period after the Official Gazette indicates that the filing date of the  
"oldest new case" awaiting action in the group to which the application is assigned, is subsequent to the  
filing date of the application, or*

*AMENDED applications within six (6) months after the filing of a response to which no reply from the PTO has been received, or  
ALLOWED applications where a notice of allowance is not received within three (3) months from the receipt of either a Form  
PTOL-327 or an Examiner's Amendment.*

*See Notice of November 24, 1971 (893 O.G. 810)*

Reg. No.: 37,794

Tel. No.: (248) 645-1483



SIGNATURE OF ATTORNEY

John E. Carlson

type or print name of attorney

1400 N. Woodward Avenue

P.O. Address

Bloomfield Hills, MI 48304-2856



**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/176,630	10/22/98	MILLINGTON	J 60.314-054

RANDALL L SHOEMAKER  
HOWARD AND HOWARD  
SUITE 101  
1400 NORTH WOODWARD AVENUE  
BLOOMFIELD HILLS MI 48304-2856

PMS1/1116

EXAMINER

NGUYEN, T

ART UNIT

PAPER NUMBER

3661

4

DATE MAILED: 11/16/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**



UNITED STATES DEPARTMENT OF COMMERCE  
**Patent and Trademark Office**  
ASSISTANT SECRETARY AND COMMISSIONER  
OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

PAPER NO. 4

### STATUS LETTER REPLY

☒ ACTION BY EXAMINER

Expected date for action on this application:

Mo. 03 Yr. 2000

☐ ACTION BY LEGAL INSTRUMENTS EXAMINER

An Office Action was mailed on \_\_\_\_\_  
(No response has been received).

☐ Other (explain) \_\_\_\_\_

Tan Nguyen  
(Patent Examiner - 3600)

Or

TAN NGUYEN  
PRIMARY EXAMINER

\_\_\_\_\_  
(Legal Instruments Exam. - 3600)

Form #TC3600-SLR (2/98)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Millington

Serial No.:

09/176,630

Filing Date:

October 22, 1998.

Group Art Unit:

3661

For:

Street Identification For A Map Zoom Of  
A Navigation System



TC 3600 MAIL ROOM

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GAU 3661  
#5  
4-3-00  
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SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

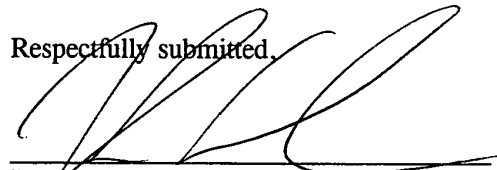
Assistant Commissioner of Patents  
Washington, D.C. 20231

PTO form 1449 is submitted herewith pursuant to the provisions of 37 CFR 1.97 and 1.98(a) as a means of complying with the requirements of 37 CFR 1.56 with respect to the above identified application. In accordance with Patent Office guidelines, copies of the citations listed on PTO 1449 are enclosed. Also enclosed is the Search Report.

Pursuant to 37 C.F.R. 1.97(e)(1), the references cited on PTO Form-1449 submitted herewith were cited in a search report of a foreign counterpart application to the above-identified application. Applicant respectfully requests the Examiner to consider the enclosed references.

Should there be a fee associated with this document, please charge it to  
Deposit Account No. 08-2789.

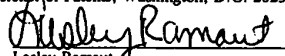
Respectfully submitted,

  
John E. Carlson  
Registration No. 37,794  
HOWARD & HOWARD ATTORNEYS, P.C.  
1400 N. Woodward Avenue, Suite 101  
Bloomfield Hills, MI 48304-2856  
(248) 645-1483

Dated: 3/17/00

CERTIFICATE OF FIRST CLASS MAILING

I hereby certify that the attached Supplemental IDS, References Cited, Form PTO-1449 and Search Report are being deposited with the U.S. Postal Service as First Class Mailing, postage prepaid, in an envelope addressed to Assistant Commissioner of Patents, Washington, D.C. 20231 on March 17, 2000

  
Lesley Ramaut

(19)



Europäisches Patentamt  
European Patent Office  
Office européen des brevets

(11) Publication number:

**0 306 088**  
**A1**

(12)

## EUROPEAN PATENT APPLICATION

(21) Application number: 88201827.8

(51) Int. Cl. 4: G09B 29/10

(22) Date of filing: 26.08.88

(30) Priority: 04.09.87 NL 8702087

(43) Date of publication of application:  
08.03.89 Bulletin 89/10(64) Designated Contracting States:  
DE ES FR GB IT SE(71) Applicant: N.V. Philips' Gloeilampenfabrieken  
Groenewoudseweg 1  
NL-5621 BA Eindhoven(NL)(72) Inventor: Schneyderberg van der Zon, Ingrid  
Anna Catharina  
c/o INT. OCTROOIBUREAU B.V. Prof.  
Holstlaan 6  
NL-5656 AA Eindhoven(NL)(74) Representative: Faessen, Louis Marie  
Hubertus et al  
INTERNATIONAAL OCTROOIBUREAU B.V. 6  
Prof. Holstlaan  
NL-5656 AA Eindhoven(NL)

(54) Vehicle navigation device with reproduction of a selected map element according to a predetermined representation standard.

(57) A vehicle navigation device, comprising a bus where to there are connected a control unit, a storage memory in which road map data is stored, a reproduction unit and a map element selector, which map element selector is suitable for selecting map elements from the road map data, which reproduction unit comprises a picture memory, a data input of which is connected to the storage memory and to a character generator, a data output thereof being connected, via a colour look-up table memory, to a display screen on which road maps to be selected can be displayed in colour, which control unit comprises a picture composition unit which is suitable for loading a road map selected from the road map data into the picture memory, which road map represents an area around a map element to be selected, and for loading a name, generated for the selected map element by the character generator, into a predetermined segment of said picture memory. The picture composition unit is also suitable for superposing a pattern, for display according to a predetermined representation standard, on that data which represents the selected map element, and for superposing said pattern on either said segment or the generated name, which predetermined representa-

tion standard is distinct from the standards used for displaying the other map elements.

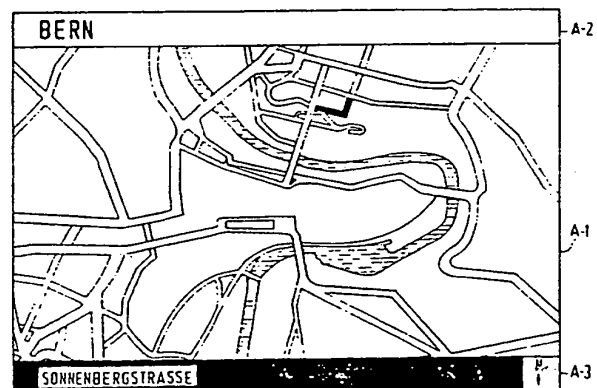


FIG. 3b

EP 0 306 088 A1

# Vehicle navigation device with reproduction of a selected map element according to a predetermined representation standard.

The invention relates to a vehicle navigation device, comprising a bus where to there are connected a control unit, a storage memory in which road map data is stored, a reproduction unit and a map element selector which is suitable for selecting map elements from the road map data, which reproduction unit comprises a picture memory, a data input of which is connected to the storage memory and to a character generator, a data output thereof being connected, via a colour look-up table memory, to a display screen on which road maps to be selected can be displayed in colour, which control unit comprises a picture composition unit which is suitable for loading a road map selected from the road map data into the picture memory, which road map represents an area around a map element to be selected, and for loading a name, generated for the selected map element by the character generator, into a predetermined segment of said picture memory.

A vehicle navigation device of this kind is known from AFIPS Conference Proceedings, 1984 National Computer Conference, 9-12 July 1984, Las Vegas, Nevada; AFIPS Press (Reston, US), M. Sugie et al.: "CAR Guide on-board computer for automobile route guidance", pages 965-706. The known vehicle navigation device comprises a reproduction unit with a display screen on which a road map can be displayed. The road map displayed is formed by the picture composition unit, under the control of the control unit, on the basis of the map data stored in the storage memory in order to display the position and the progress of the vehicle through the road network. The road map is displayed in colour in a first part of the picture. A second part of the picture includes written information on the map displayed in the first part. To this end, the picture memory comprises separate sections for forming the picture to be displayed. Using a map element selector, map elements can be selected from the road map stored. The selected map element with its name and its environment are displayed on the display screen.

It is a drawback of the known device that the relationship between a map element and its name is only apparent from the predetermined location of said name (i.e. at the lower left of the display).

It is the object of the invention to realize a vehicle navigation device in which the relationship between the selected map element on the road map and its name is recognized at a glance.

To achieve this, a vehicle navigation device in accordance with the invention is characterized in

that the picture composition unit is also suitable for superposing a pattern, for display according to a predetermined representation standard, on that data which represents the selected map element, and for superposing said pattern on either said segment or the generated name, which predetermined representation standard is distinct from the standards used for displaying the other map elements. Due to the superposition of a pattern on the relevant map element as well as on its name or the background thereof, which pattern ensures that the selected map element is displayed in the road map according to a predetermined representation standard which is not used for any further map element, the relationship between the selected map element and its name is evident at a glance.

A preferred embodiment of a vehicle navigation device in accordance with the invention is characterized in that said pattern contains a colour code for display in a predetermined colour. Because the road map is displayed in colours, the use of a predetermined colour results in a simple and effective realization of the invention.

A further embodiment of a vehicle navigation device in accordance with the invention is characterized in that said colour code designates contrasting colours for the display of said segment and said name. This realizes a better legibility.

Preferably, said colour code is the colour code for display in the colour light-yellow. The colour light-yellow is hardly ever used for other map elements so that it is very suitable for use as the predetermined representation standard.

In another embodiment, said segment extends in a part of the picture memory which is nearby the selected map element. As a result, the relationship between the map element and its name becomes even more evident.

In another embodiment in accordance with the invention said segment is located to the right of the corresponding selected map element, and can be moved by a user via an interface with respect to the map element.

This is useful if the user would like to have a look at the part of the road map masked by the segment.

Preferably, the picture composition unit is suitable for loading data into said segment, the set-up being such that the contents of said segment is surrounded by a box when displayed on the display screen. The introduction of a box offers a clear distinction between the various parts of the picture.

The invention will be described in detail

hereinafter with reference to the drawing; therein:

Fig. 1 shows the major components of an embodiment of a vehicle navigation device.

Fig. 2 is a more detailed representation of the construction of an input/output interface and the communication members connected thereto.

Fig. 3-a shows an example of a road map as displayed on the display screen of the device.

Fig. 3-b shows the same road map as shown in Fig. 3-a, be it with the selected map element as displayed when use is made of the invention.

Fig. 4 shows a flowchart representing an example of a picture-forming program.

Fig. 1 shows the major components of an embodiment of a vehicle navigation device. The device comprises a bus 1 where to there are connected a control unit 2, for example a microprocessor, a working memory 3 and a storage memory 4. The storage memory is formed, for example, by an optical disc and an associated read member. Road map data, navigation data and other control data are stored in the storage memory. The map data is stored in the memory 4 in the form of tables, for example as described in the article "Map storage on CD-ROM", by D.F. Cook, published in BYTE, July 1987, Vol. 12, No. 8. A first input/output interface 5 and a second input/output interface 9 are also connected to the bus 1. For example, an electromagnetic compass 6, wheel sensors 7 and an odometer 8 are connected to the first interface 5: The elements 6, 7, 8 all serve to pick up data in order to enable determination of the position of the vehicle. The determination of a vehicle position by means of a navigation system is described, for example in the article "EVA-Ortungs- und Navigationssystem für Landfahrzeuge" by E.P. Neukirchner, O. Pilsak and D. Schlögl, published in Nachrichtenzeitschrift Bd-36 (1983), Heft 4, pp. 214-218. A keyboard 10 and a reproduction element 11 are connected to the second input-output interface. The keyboard 10 is used inter alia for entering a starting point and a destination for the device and also for the selection of further map elements. The reproduction element 11 is formed, for example by a display screen in combination with a loudspeaker. On the display screen there is displayed inter alia a road map on which the position and progress of the vehicle through the road network is shown. Further details as to how a determined vehicle position and the progress of the vehicle are displayed on the display screen are given, for example in PCT Patent Application No. WO 86/02764.

Fig. 2 shows a more detailed construction of the second input/output interface and the communication members connected thereto. The input/output interface comprises a further bus 20 which is connected to the bus 1. To the further bus

there are connected a control member 21, for example a microprocessor, and a picture memory 22, a character generator 23 and a communication module 27. The keyboard 10 is connected to the communication module 27 which provides the communication between the keyboard 10 and the other members. A data output of the picture memory 22 is connected to an address input of a colour look-up table memory 24 in which colour words are stored in order to display the information stored in the picture memory in colour on the picture tube 26. The contents and the operation of such a colour look-up table memory are described, for example in British Patent Application No. 2 032 740. Between the data output of the colour look-up table memory and the picture tube there is connected a digital-to-analog converter 25 which converts the digital colour words from the colour look-up table memory into control signals for the red, the green and the blue electron gun of the picture tube.

Fig. 3-a shows an example of a picture such as displayed on the picture tube 26 of the reproduction element. The black-and-white picture shown in Fig. 3-a is actually a colour picture. The picture shown is subdivided into two non-overlapping parts. In a first part (A-1) a road map is displayed. The second part (A-2) is formed by a title bar in which information on the road map displayed in the first part is included. In the present example the road map shown is formed by the map of a city, in this case the city of BERN, and the name of the city is displayed in the title bar (part A-2). Other information which can be displayed in the title bar is, for example "musea", "restaurants", "post offices". The indication in the title bar is preferably displayed on a background colour, for example light-grey, in order to improve discrimination in the display. Furthermore, for each theme a given colour can be selected for the letters forming the information. For example, the name of the city is displayed in black letters and the indication "musea" in purple letters. This also makes a contribution to the discrimination in the display.

Fig. 3-b shows substantially the same road map as shown in Fig. 3-a; however, at the lower side of the picture there is provided a further bar (A-3) in which an indication is given of a map element which forms part of the road map displayed in the first part. In the example shown in Fig. 3-b, a street name is displayed in the further bar, in this case Sonnebergstrasse. In order to display the map element given in the further bar in a very distinct manner, the relevant map element as well as its name or the background thereof is displayed according to a given representation standard, which representation standard is used exclusively for the display of the relevant map element



and not for any other map element. Such a predetermined representation standard is formed, for example by a predetermined colour which is not used for the display of other map elements, or by the introduction of a shading across or a contour around the relevant map element. Because the predetermined representation standard is used only for the display of the relevant map element and its name or the background thereof, the relevant map element will be clearly distinct from the other map elements displayed and the relationship with its name is evident. Thus, in the present example the Sonnebergstrasse is displayed according to said predetermined representation standard for which a shading is chosen in the Figure. Preferably, however, a colour is chosen for said predetermined representation standard (this colour, however, cannot be shown in the Figure 3-b). Preferably, the colour light-yellow is chosen because this is a colour which is not or hardly ever used for other topological purposes (perhaps only for indicating a desert). When the selected map element were situated in an environment having a mainly yellow colour, for example in a desert, another colour, for example light-green, would be selected for the display of the selected map element.

In Fig. 3-b, the shading used for the display of the map element in the first part is also used at the bottom of the picture as a background in the further bar. Preferably, said further bar is enclosed in a box in order to make the separation from the first part more distinct. A further possibility of displaying the name of the selected map element in said further bar consists, for example in the use of a contrasting colour of the background colour for the name.

The display according to the predetermined representation standard of a map element in the first part and the associated name in the further bar is initialized under the control of a user. The user can for request a given map element, for example the name of a street, the location of the post office or a hotel in the vicinity. To this end, the user makes his wish known to the device either by means of the keyboard or, when the display screen comprises position detection means, by indicating a position on the display screen. The keyboard or the position detection means, in cooperation with the picture displayed, thus form a map element selector whereby the user selects a map element.

The formation of such a picture will now be described with reference to the flowchart of the picture-forming program shown in Fig. 4. The various steps in said flowchart are executed under the control of the control unit 21 (Fig. 2). To this end, the control unit 21 controls the elements 20, 23, 24, 25 and 26 which form a reproduction unit in conjunction with the control unit. As has already been

stated, the picture-forming program is stated (30) after the selection of a map element by a user. The various steps of the picture-forming program will now be described.

### 31 FT PS:

The request as formulated by the user or the device is stored in a working memory of the control unit 21. When the request is formulated, for example by means of the keyboard, the request entered is transferred to the working memory via the communication module 27. When the request is formulated by touching a position on the display screen the coordinates of the point touched are stored in the working memory.

### 32 KAD:

Data is loaded into a predetermined segment (22-C) of the first part (22-A) of the picture memory in order to display a box at the bottom of the picture, which box forms the further bar. This box is subsequently displayed on the display screen in order to confirm a map element selection.

### 33 ID PS:

This is an identification of the request where the control unit identifies the contents of the request. When the request was formulated by means of the keyboard, the control unit checks which map element (street name, museum, etc.) was entered. When position-determining means are used, the control unit checks the information which was displayed at the indicated position in order to identify the indicated map element.

### 34 IM?:

During this step it is checked whether the selected map element is indeed present in the picture displayed. This is because the selected map element may be situated in the predetermined segment 22-c in which case it would be overwritten by the further bar; it may also be that the map element selected by the keyboard is not situated within the picture displayed.

#### 35 FT IMD:

When the selected map element is not situated in the picture displayed, the contents of the picture memory (part 22-A) is adapted so that the selected map element is indeed situated in the picture.

#### 36 MEM CH:

On the basis of the data identified during the previous step, from the data of the storage memory the data is searched which is necessary for granting the formulated request. The search from the data of the storage memory is known per se. As is described in the cited article "Map Storage on CD-ROM", the storage memory contains street names and other map elements which can be fetched in a known manner

#### 37 FT RS:

When the necessary data has been found among the memory data (for example, street names, locations and names of musea, etc), this data is transferred to the working memory.

#### 38 ACT KAR:

The character generator 23 is activated in order to display the map element indication for the selected map element in the further bar of the picture. To this end, the character generator receives data from the data fetched during the previous step.

#### 39 ACT RP:

The pattern providing the display according to the predetermined representation standard is formed. When the predetermined representation standard consists of a colour code, the colour code is then fetched, for example for an appropriate memory location in the control unit.

#### 40 CORR?":

During this step it is checked whether the predetermined representation standard is sufficiently distinct from the representation of the environment of the selected map element. For example, when the colour light-yellow was chosen as the predetermined representation standard, it is checked whether the colour yellow has not been

used for map elements displayed in the vicinity of the selected map element. It will be evident that, when yellow is not used for the normal display of map elements, this step can be omitted like the step 41.

#### 41 OTH RP:

If insufficient distinction is found in the step 40, another representation standard is chosen, for example light-green if yellow has already been used.

#### 42 MX:

This pattern is superposed on the picture data for the map element selected by the request, and also on the data from the character generator in order to compose the picture to be displayed.

#### 43 LD PM:

The picture memory 22 is loaded, the picture data (character + colour code) for the further bar being loaded into the part 22-C, the picture data for the map data, including the colour code for the relevant map element, being loaded into the part 22-A; the title bar is loaded into the part 22-A.

#### 44 DISP:

The contents of the picture memory is transferred, via the colour look-up table memory 24 and the converter 25, to the picture tube 26 for presentation.

#### 45 STP:

This is the end of the program.

#### Claims

1. A vehicle navigation device, comprising a bus whereto there are connected a control unit, a storage memory in which road map data is stored, a reproduction unit and a map element selector which is suitable for selecting map elements from the road map data, which reproduction unit comprises a picture memory, a data input of which is connected to the storage memory and to a character generator, a data output thereof being connected, via a colour look-up table memory, to a display screen on which road maps to be selected

can be displayed in colour, which control unit comprises a picture composition unit which is suitable for loading a road map selected from the road map data into the picture memory, which road map represents an area around a map element to be selected, and for loading a name, generated for the selected map element by the character generator, into a predetermined segment of said picture memory, characterized in that the picture composition unit is also suitable for superposing a pattern, for display according to a predetermined representation standard, on that data which represents the selected map element, and for superposing said pattern on either said segment or the generated name, which predetermined representation standard is distinct from the standards used for displaying the other map elements.

2. A vehicle navigation device as claimed in claim 1, characterized in that said pattern contains a colour code for display in a predetermined colour.

3. A vehicle navigation device as claimed in Claim 2, characterized in that said colour code designates contrasting colours for the display of said segment and said name.

4. A vehicle navigation device as claimed in Claim 2, characterized in that said colour code is the colour code for display in the colour light-yellow.

5. A vehicle navigation device as claimed in any one of the preceding Claims, characterized in that said segment extends in a part of the picture memory which is nearby the selected map element.

6. A vehicle navigation device as claimed in Claim 5, characterized in that said segment is located to the right of the corresponding selected map element, and can be moved with respect to the map element by a user via an interface.

7. A vehicle navigation device as claimed in any one of the preceding Claims, characterized in that the picture composition unit is suitable for loading data into said segment, the set-up being such that the contents of said segment is surrounded by a box when displayed on the display screen.

50

55

6

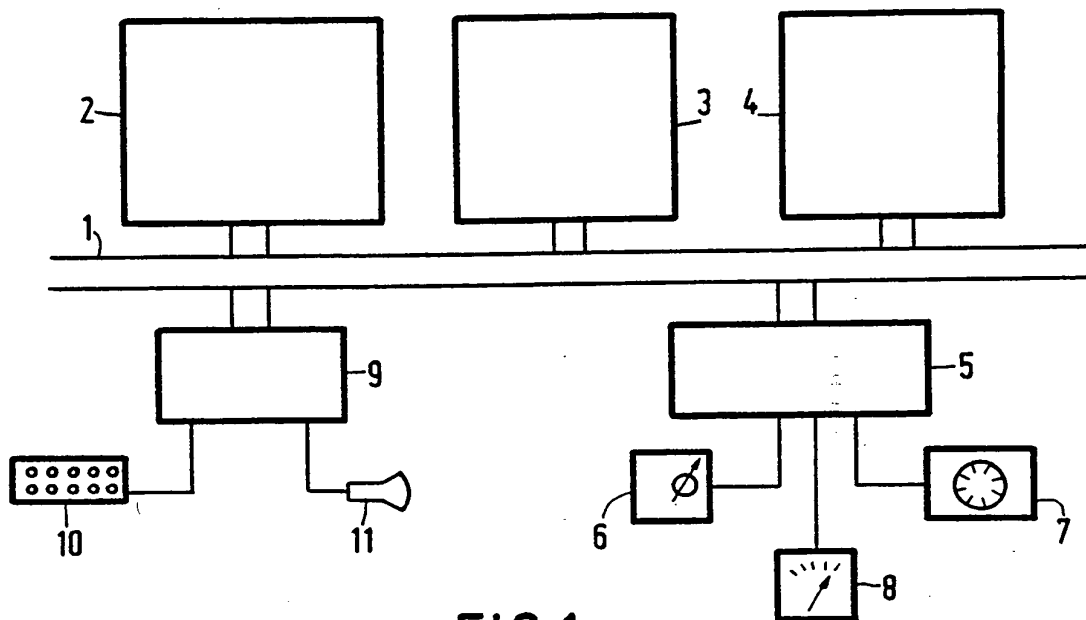


FIG. 1

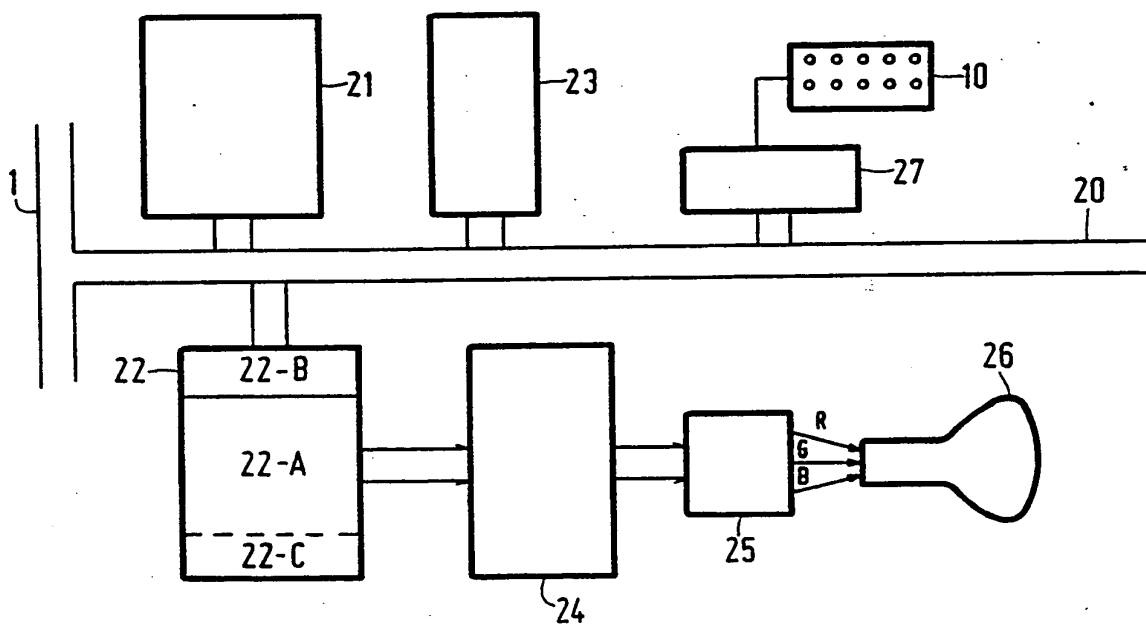


FIG. 2

1-III - PHN 12252

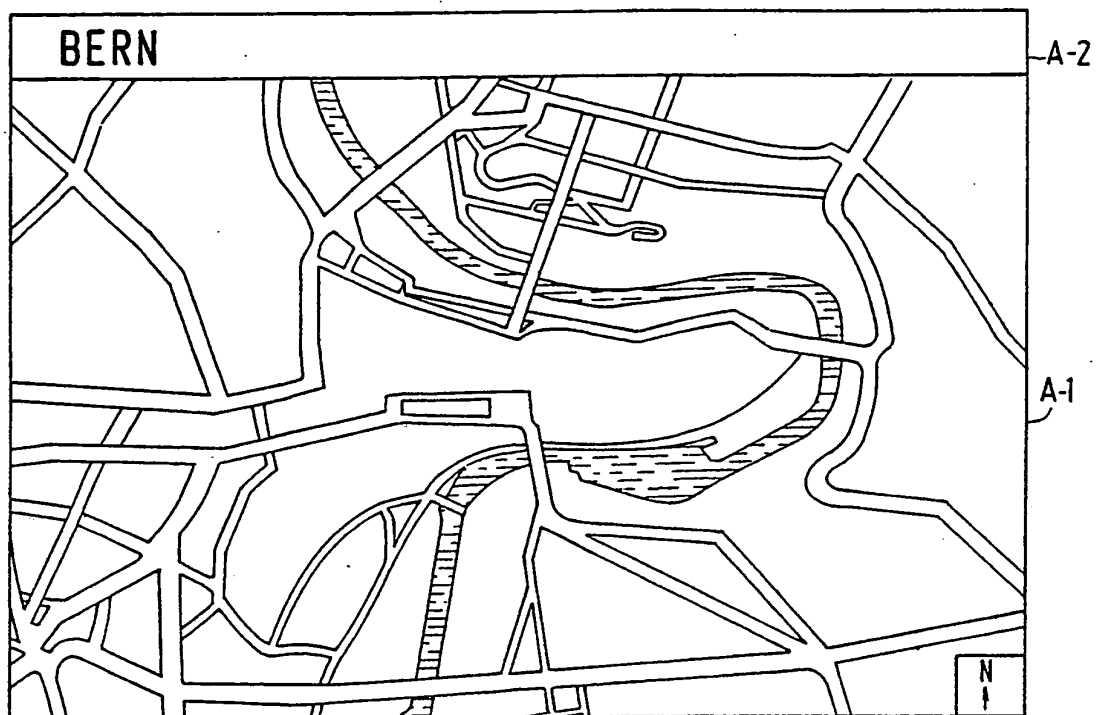


FIG. 3a

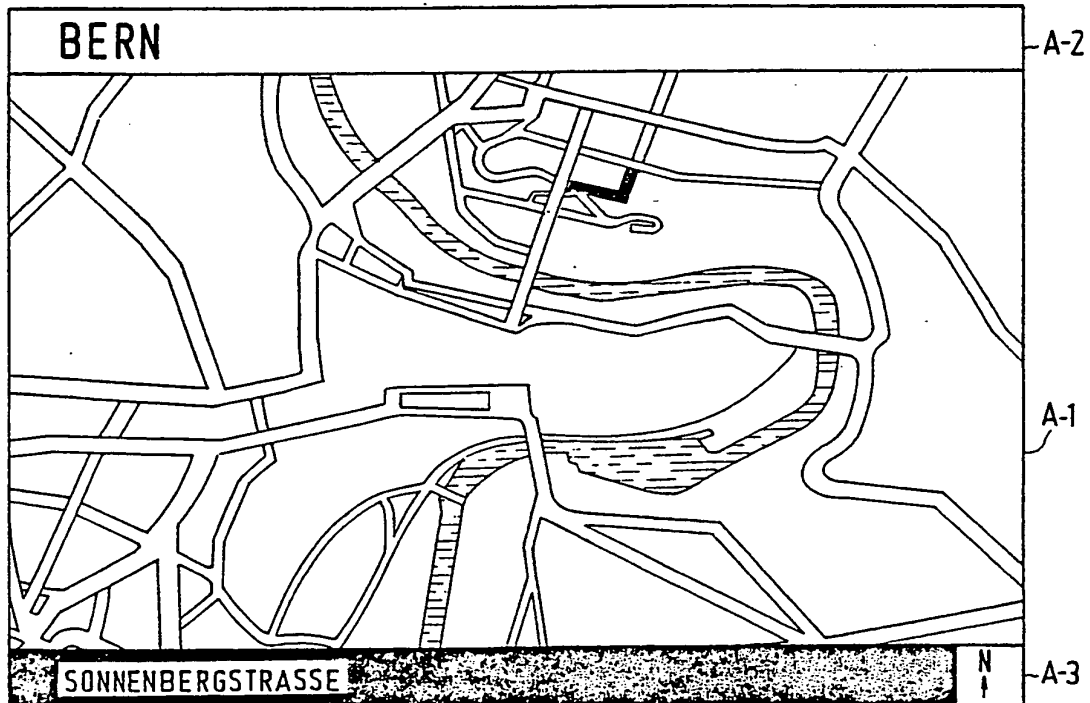


FIG. 3b

2-III - PH N 12252

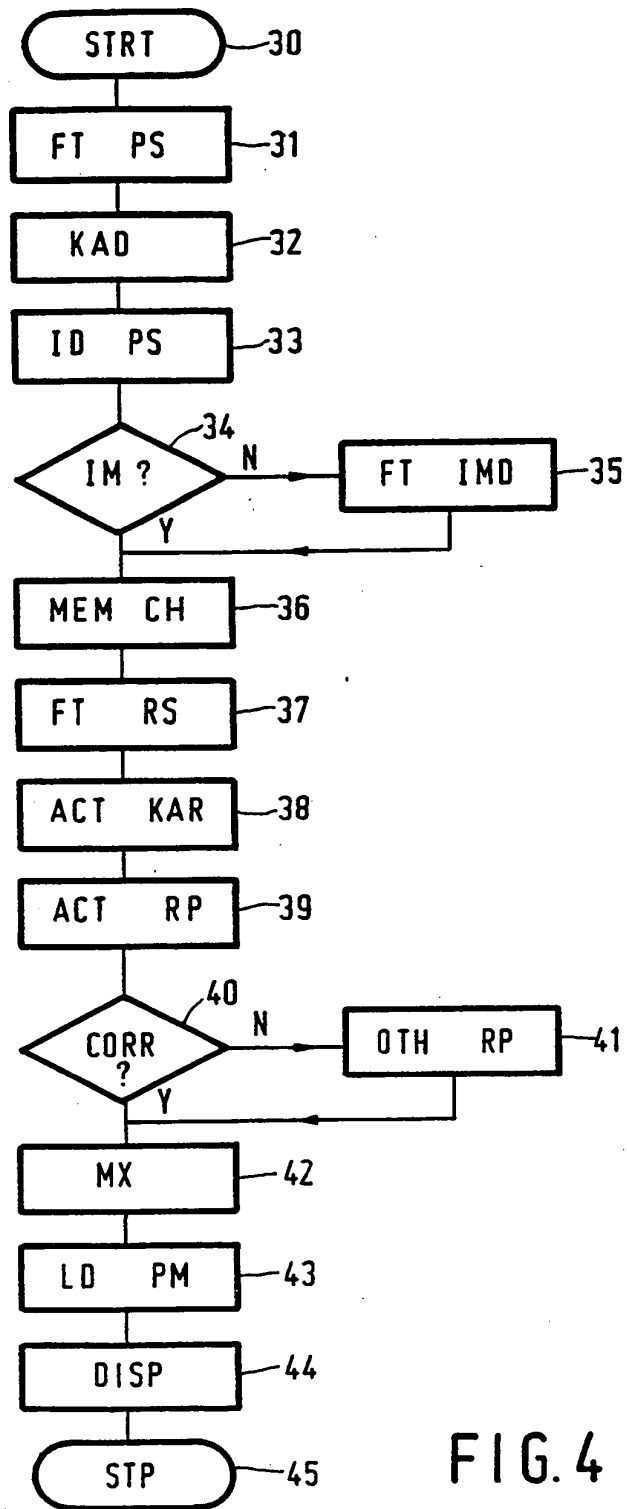
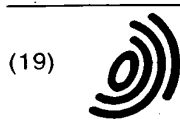


FIG. 4

3-III-PHN 12252



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
Y	DE-A-3 405 125 (U. BRANDT) * Page 10, lines 1-16; page 12, lines 1-6; page 14, lines 8-17; figures 1-3 *	1	G 09 B 29/10
A	---	2-7	
A	AFIPS CONFERENCE PROCEEDINGS, 1984 NATIONAL COMPUTER CONFERENCE, Las Vegas, Nevada, 9-12 July 1984, pages 695-706, AFIPS Press, Reston, US; M. SUGIE et al.: "CARguide--on-board computer for automobile route guidance" * Pages 698-701 *	1,2-7	
A	GB-A-2 032 740 (D. JAMES) ---		
A	NACHRICHTENTECHNISCHE ZEITSCHRIFT, Vol. 36, Nr. 4, 1983, pages 214-218, VDE Verlag GmbH, Berlin, DE; E.P. NEUKIRCHNER et al.: "EVA-Ortungs- und Navigationssystem für Landfahrzeuge" * Pages 214-223 *		
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			G 09 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11-10-1988	Examiner ODGERS M. L.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	



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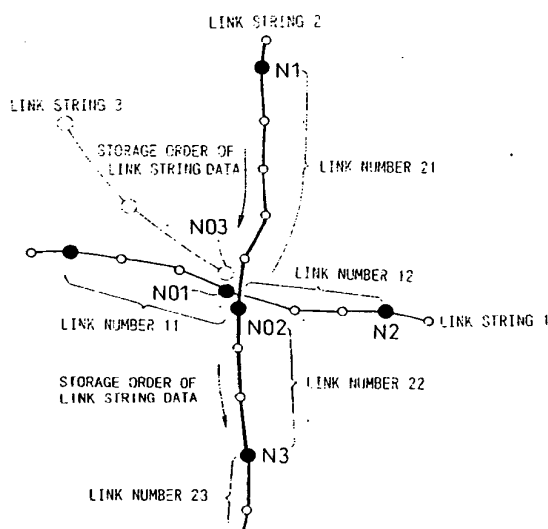
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### (54) Navigation system

(57) A navigation navigation system according to the present invention comprises: a database apparatus provided with map display data constituted of data representing road positions and physical forms provided in separate sets to correspond to different scales and route search data constituted of data representing connection states of one road connecting with another road provided in separate sets to correspond to different scales; and a control apparatus that, when displaying recom-

mended route data obtained by performing a search using the route search data at a specific first scale superimposed upon a roadmap that is displayed on a monitor based upon map display data at a second scale that is larger than the first scale, reads out physical form data of the recommended route data obtained by performing the search using the route search data at the first scale based upon the map display data at the second scale and displays the physical form data superimposed upon the roadmap on the monitor.

FIG. 5





## Description

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to a navigation system that is capable of searching a recommended route based upon a plurality of sets of map data at different scales and drawing the recommended route superimposed upon display maps at different scale.

#### 2. Description of the Related Art

Vehicular navigation systems in the known art are provided with a function for displaying a roadmap of the area where the vehicle is currently located, a function for accurately detecting the vehicle position through map matching, a function for calculating a recommended route from a point of departure to a destination and the like. In these vehicular navigation systems in the prior art, roadmap display data, data for map matching and data for route search are separately stored in a CD ROM in order to maintain compatibility with existing software programs and also to improve the processing speed.

The roadmap display data include widest range map data for displaying large areas at the smallest scale, most detailed map data for displaying small areas in detail at the largest scale and a plurality of sets of map data at different scales between that of the widest range map data and that of the most detailed map data. For instance, the widest range map data may be referred to as level 4 data, the most detailed map data may be referred to as level 1 data and the sets of data at scales between those of the level 4 data and the level 1 data may be referred to as level 3 data and level 2 data. In that case, the route search data include two sets of data that correspond to the level 4 and level 2 roadmap data, and the vicinity of the point of departure and the vicinity of the destination are searched using the level 2 data and the other area is searched using the level 4 data for route search to reduce the length of time required for the route search.

In this specification, a level with a large level number is referred to as a high order level, whereas a level with a small level number is referred to as a low order level.

FIG. 21 illustrates a roadmap depiction of roadmap display data which are stored in memory as level 4 data and level 3 data. The level 4 roadmap display data and the level 3 roadmap display data are separately stored in CD ROM media. FIG. 21A shows a roadmap corresponding to one of the meshes in the level 4 data, i.e., a mesh M4, in which a road D1 and two roads D2 and D3 that connect at intersections C1 and C2 at the two ends of the road D1 are present. One of the small areas achieved by dividing one of the meshes of the level 4 data, i.e., the mesh M4 equally into sixteen portions, i.

e., the hatched small area m3, constitutes a mesh of the level 3 data, i.e., a mesh M3 and, as shown in FIG. 21B, only a portion of the road D1, i.e., a road D4 is present in the mesh M3.

There is a problem in the system in the prior art described above in that when the recommended route is displayed superimposed upon a roadmap at level 2 or level 1 displayed on the monitor based upon the recommended route data which constitute the results of a route search performed at level 4, a great length of time is required for data conversion processing.

Also, if the detail button is operated while the roadmap corresponding to the mesh M4 in the level 4 data is displayed on the monitor, the roadmap corresponding to the mesh M3 in the level 3 data will be displayed on the monitor. However, since there are no identification data to indicate that the road D1 and the road D4 are the same road, it is difficult to make a given road correspond through the different levels. In addition, a similar problem exists in regard to the route search data, and it is difficult to make the data searched at level 2 correspond to the data searched at level 4 in recommended route data that are the result of a route search. Moreover, since there are no identification data to indicate that a road in the roadmap display data and a road in the route search data are the same, it is difficult to achieve correspondence of a given road when the recommended route data are superimposed upon the roadmap display data.

### SUMMARY OF THE INVENTION

An object of the present invention is to provide a navigation system with which the processing time for superimposing a recommended route upon a display map at a lower order level by using recommended route data at a higher order level is reduced.

In order to attain this object, a navigation system according to the present invention comprises: a database apparatus provided with map display data constituted of data representing road positions and physical forms provided in separate sets to correspond to different scales and route search data constituted of data representing connection states of one road connecting with another road provided in separate sets to correspond to different scales; and a control apparatus that, when displaying recommended route data obtained by performing a search using the route search data at a specific first scale superimposed upon a roadmap that is displayed on a monitor based upon map display data at a second scale that is larger than the first scale, reads out physical form data of the recommended route data obtained by performing the search using the route search data at the first scale based upon the map display data at the second scale and displays the physical form data superimposed upon the roadmap on the monitor.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a block diagram of an embodiment of a navigation system for vehicles according to the present invention.

FIG. 2 shows an example of two roads intersecting within a mesh range.

FIG. 3 shows a diagram illustrating link string data.

FIG. 4 shows the structure of roadmap display data.

FIG. 5 shows an example of a roadmap with a plurality of nodes and a plurality of interpolation points.

FIG. 6 shows a diagram illustrating the link string data corresponding to the road indicated with the bold line in FIG. 5.

FIG. 7 shows a diagram illustrating offset information that is added into link string data for reading out immediately preceding data.

FIG. 8 shows a method for reading out the link string data from the rear end.

FIGs. 9A through 9D show different data lengths of node information and interpolation point information.

FIGs. 10A and 10B show an example of attribute 1 + X coordinate data.

FIGs. 11A and 11B show an example of attribute 2 + Y coordinate data.

FIG. 12 shows a diagram illustrating link numbers in route search data.

FIG. 13 shows the structure of route search data.

FIG. 14 shows an overview of the structure in the recommended route data.

FIGs. 15A and 15B show a detailed diagram illustrating the data structure of the node information and the link information in the recommended route data.

FIG. 16 shows a flowchart outlining the main processing performed by the control circuit.

FIG. 17 shows the flowchart continuing from FIG. 16.

FIG. 18 shows a detailed flowchart illustrating the background map drawing processing performed in step S8 in FIG. 17.

FIG. 19 shows a detailed flowchart illustrating the recommended route drawing processing performed in step S9 in FIG. 17.

FIGs. 20A through 20C show the procedure taken for drawing a recommended route in the image memory based upon the recommended route data in this embodiment.

FIGs. 21A and 21B show a diagram illustrating link strings and links at different levels.

FIG. 22 shows an example of link data and node data in the prior art.

FIG. 23 shows a diagram illustrating an example of the prior art in which the separate segments of a road are assigned to separate links across an intersection.

FIG. 24 shows the relationship between route search data and route display data in the prior art.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 is a block diagram of an embodiment of a navigation system for vehicles that is internally provided with a map database apparatus according to the present invention. In FIG. 1, reference number 1 indicates a current position detection apparatus that detects the current position of a vehicle, which is constituted with, for instance, an azimuth sensor that detects the bearing of the vehicle while traveling, a vehicle speed sensor that detects the speed of the vehicle, a GPS sensor that detects a GPS signal from a GPS (Global Positioning System) satellite and the like.

Reference number 2 indicates a control circuit that controls the entire system and is constituted with a microprocessor and peripheral circuits. Reference number 3 indicates an input device for inputting destinations and the like for vehicles, reference number 4 indicates a DRAM that stores vehicle position information and the like detected by the current position detection apparatus 1, reference number 5 is an image memory that stores image data for display on a display device 6 and image data stored in the image memory 5 are read out as necessary to be displayed on the display device 6. Reference number 7 indicates an SRAM that stores node information, link information and the like on the recommended route calculated by the control circuit 2.

Reference number 8 indicates a map database apparatus that stores various types of data for performing roadmap display, route search, map matching and the like, which is constituted with, for instance, a CD ROM device, a magnetic recording device and the like. In the map database apparatus 8, map display data that constitute information related to road physical forms, road classifications and the like, and route search data that constitute branching point information, intersection information and the like that are not directly related to road physical forms, are stored. The map display data are mainly used when displaying a roadmap on the display device 6 and the route search data are mainly used when calculating a recommended route.

Next, the data structures of the map display data and the route search data stored in the map database apparatus 8 are described.

## [1] Map display data

## (1) Overview of link string data

Data management of the map display data in this embodiment is performed for each mesh range representing one of the partitioned areas achieved by dividing a roadmap into specific ranges, and individual roads present in a mesh range constitute separate link strings. For instance, as shown in FIG. 2, when two roads D1 and D2 intersect in one mesh range, the two roads constitute separate link strings 1 and 2, with the link string

1 comprising links 11 and 12 and the link string 2 comprising links 21 - 23. In this example, the links in the link string 1 and the links in the link string 2 represent roads of the same type. A link is the minimum unit that can represent a road and, in FIG. 2, the segment between the intersections constitutes one link unit, with inherent numbers assigned to the individual links (hereafter referred to as link numbers) for identification. The intersections in FIG. 2, i.e., the connection points of the individual links are expressed as nodes N0 N4. Nodes also constitute the start points and the end points of the individual links and, as detailed later, interpolation points that further divide the segments between nodes may sometimes be provided as well.

Also, in this embodiment, when there is a distinct structure such as a bridge, a tunnel or the like, on a road, the portions of the road preceding and following the structure constitute separate link strings. For instance, when there is a bridge and a tunnel on National Highway 246, as shown in FIG. 3, the portions preceding the bridge and the tunnel, the blocks corresponding to the bridge and the tunnel and the portions following the bridge and the tunnel all constitute separate link strings. In FIG. 3, these strings are designated as link strings 101 - 105. By making the portions preceding and following a distinctive structure on a road separate link strings, search of bridges, tunnels and the like on a roadmap is facilitated.

The map display data comprise a plurality of sets of data at different scales. In the explanation of this embodiment, the data at each scale are referred to as level n (n may be 1-4, for instance) data. Level 1 corresponds to the most detailed roadmap and as the level goes up, a roadmap over a wider range is presented at a smaller scale. Furthermore, as detailed later, in this embodiment, identical links at different levels are managed with identical (inherent) link number to facilitate making data correspond among different levels. The link number will be explained later.

## (2) Data structure of link string data

To give an explanation of the roads in FIG. 2, the map display data are structured by providing sets of link string data, each including various types of information related to the link string 1 or 2-n, for individual link strings, as shown in FIG. 4, and the data corresponding to each link string include link string information and node link information, with the link string information comprising the following types of data, as shown in FIG. 4.

- 1 link string size
- 2 number of element points
- 3 link attribute
- 4 road name offset
- 5 road number

In addition, the node link information comprises the following types of data, as shown in FIG. 4.

- 1 attribute 1 + X coordinate
- 2 attribute 2 + Y coordinate
- 3 identical node offset
- 4 guide offset
- 5 link number
- 6 altitude information

## (3) Link string information

In FIG. 4, the link string size represents the storage size of the link string data, by referring to this storage size, prompt access to the next link string data is achieved. The number of element points data indicate the total number of node points and interpolation points, the link attribute data indicate the type of road, such as a national highway, a prefectural road, an expressway or the like and the road number is the actual designation number assigned to a national highway or prefectural road. The explanation of the road name offset is omitted since it is not relevant to this embodiment. The interpolation points are to be explained later.

## (4) Node link information

FIG. 5 shows the link strings 1 and 2 in FIG. 2 in more detail. For instance, the node link information of the link string 2 indicated with the bold line in FIG. 5 is as shown in FIG. 6. As shown in the figure, the data on the link string 2 include node information related to nodes N1, N02 and N3 (filled circles in FIG. 5) on the link string and interpolation point information related to the interpolation points (outline circles in FIG. 5). The node information includes positional X and Y coordinates of the node, the attribute and the link numbers of links connected to the node, whereas the interpolation point information includes the positional X and Y coordinates of the interpolation point. These positional coordinates are used as physical form data for recommended route display or physical form data for map matching, to be detailed later. The link string 2 indicated with the bold line in FIG. 5 includes a link assigned with a link number 21 located between the nodes N1 and N02, a link assigned with a link number 22 located between the nodes N02 and N3 and a link assigned with a link number 23 connected to the node N3. As is obvious from FIG. 6, the node information on the node N02 is shared by the link with link number 21 and the link with link number 22. The node information and the interpolation point information are positioned in the data structure in the order in which the links are connected. Thus, by sequentially reading out the link string data starting with the front end address, the road physical form, the road type and the like of the overall link string can be detected.

As has been explained, since, in this embodiment,

data are managed in units of link strings within one mesh range and nodes between adjacent links are shared by the adjacent links, the entire volume of the data can be reduced compared to the case in which the data are managed in units of links, as in the example of the prior art shown in FIG. 22. In FIG. 22, links L0 - L3 have nodes N0b, N1a, N1b ... N3a at their start points and end points and sets of identical node information C01, C10 ... for indicating identical nodes are provided as connection information for the individual nodes.

#### (5) Offset indicating an identical node

In FIG. 5, of the nodes at the intersection of the link string 1 and the link string 2 and the link string 3, the node in the link string 1 is assigned with a reference number N01, the node in the link string 2 is assigned with a reference number N02 and the node in the link string 3 is assigned with a reference number N03. In the data structure, the sets of node information corresponding to the intersecting points N01 - N03 each has a data item referred to as an identical node offset.

The identical node offset is explained in detail in reference to FIG. 7. For instance, the address value indicating a storage area for the node information of the node N01 in the link string 1 is stored in memory as the identical node offset of the node N02 in the link string 2. Likewise, the address value indicating the storage area for the node information of the link string 3 is stored in memory as the identical node offset of the node N01 of the link string 1 and the address value of the address at which the node information of the node N02 in the link string 2 is stored in memory as the identical node offset of the node N03 in the link string 3.

Since nodes other than those at intersection, which are indicated as the intersecting points N01 - N03 in FIG. 5, do not intersect other roads, a specific value, i.e., FFFFh, for instance, that indicates that no other node exists to constitute an identical node, is stored in the identical node offset storage areas of the node information for these nodes.

By providing the identical node offset in this manner, even when there are a plurality of sets of node information in regard to identical nodes, as in the case of an intersection, the corresponding relationships among the individual sets of node information can be easily ascertained. Also, in contrast to an apparatus in the prior art shown in FIG. 23, which requires 5 nodes (N0a - N0d) corresponding to the intersection where three roads intersect, only three nodes (N01 - N03) are required in this embodiment, as shown in FIG. 5, achieving a reduction in the data volume.

#### (6) Attribute 1

The attribute 1, which is stored together with the X coordinate of a node is constituted of offset information for reading out the link string data in the reverse direc-

tion. As explained earlier, in the link string data, the node information and the interpolation point information and the like are positioned in the order in which the actual connections are made. Because of this, by reading out the link string data sequentially from the front end address in the storage area, the road physical form can be accurately ascertained starting at the front end position.

There are also situations in which it is necessary to ascertain the road physical forms from the end by reading out the link string data from the end. In such a case, after reading out the node information or the interpolation point information at the rear end, the header position of the node information or the like that is set immediately before in data arrangement must be detected. For instance, when reading out the link string data (FIG. 6) of the link indicated with the bold line in FIG. 5 from the end, it is necessary to first read out the node information on the node N3 and then to detect the header position of the interpolation point information that is set immediately before in the data arrangement to read out the interpolation point information from this header position, as indicated with the arrows in FIG. 8. However, as explained below, the data volume of the node information and the interpolation point information varies among various nodes and interpolation points, and the header positions of node information and interpolation point information cannot be determined uniformly.

FIGS. 9A - 9D shows varying data volumes of node information and interpolation point information, with FIG. 9A representing a case in which node information or the like is constituted with two words, i.e., the X and Y positional coordinates, FIG. 9B representing a case in which node information or the like is constituted with three words by adding identical node offset to the two words in FIG. 9A, FIG. 9C representing a case in which node information or the like is constituted of four words by adding guide offset information to the three words in FIG. 9B and FIG. 9D representing a case in which node information or the like is constituted of five words by adding a link no. to the four words in FIG. 9C.

As shown in FIGS. 9A - 9D, since the data volume of node information or interpolation point information varies for each case, the information that indicates the header positions of the node information and the interpolation point information is added to the link string data in advance as attribute 1 data in this embodiment. In this embodiment, they are added together with the X positional coordinates of the individual nodes and interpolation points.

For instance, FIG. 10A shows an example in which the X positional coordinates are stored in the lower order 11 bits and information that indicates the header positions of various sets of node information and the like is stored in the higher order 2 bits, in the 2-byte data constituting the attribute 1 + X coordinate data. The information that indicates the number of words that are present up to the header position of each set of node

information or the like is stored in these higher order 2 bits.

Thus, since the information that indicates the head-er position of the immediately preceding set of node in-formation or the like is added to the link string data in this embodiment, even when the link string data are read out in the reverse direction, the entire node information or the like can be read out without omissions.

#### (7) Attribute 2

The attribute 2, which is stored together with the Y coordinate of a node, includes traffic regulation informa-tion, road width information and number of lanes infor-mation. The data length of each set of data of the node link information that constitutes the link string data is 16 bits (2 bytes = 1 word). In the lower order 11 bits of the data indicating the attribute 2 + Y coordinate, the Y po-sitional coordinates are stored and in the higher order 5 bits, the traffic regulation information, the road width in-formation and the number of lanes information are stored, as shown in FIG. 11A. One type of the informa-tion from 1 - 8 in FIG. 11B is selected through a specific bit combination for the higher order 5 bits.

Since the road width information, the traffic regula-tion information and the number of lanes information are stored by using the available bits in the 2 byte data for storing the positional coordinates or the like of a node, the road width information, the traffic regulation informa-tion and the like can be added to the link string data with-out having to increase the volume of data.

#### (8) Altitude information

When displaying a roadmap in three dimensions, data concerning the altitude differences among a plural-ity of points on the roadmap are required. Accordingly, as shown in FIG. 4 in this embodiment, all the altitude information on the various links constituting a link string is added at the end of the link string data. It is to be noted that since link string data including altitude information and link string data without altitude information are present together, each set of altitude information can be added to a plurality of nodes and a plurality of interpo-lation points.

By adding the altitude information to the link string data, a roadmap can be displayed in three dimensions. In addition, since all the altitude information is added together at the end of the link string data, the altitude information can be read out only when it is required and when the altitude information is not required, such as when displaying a regular flat map, for instance, only the data immediately preceding the altitude information need be read out.

#### (9) Inherent link numbers shared among levels

A link number is stored between sets of the attribute

1 + X coordinate and the attribute 2 + Y coordinate of node for each link. In this embodiment, the link number assigned to a link at the highest order level is also as-signed as the link number of corresponding links at low-er order levels. In other words, the link number assigned to a link at the highest order level is also assigned as the link number of the corresponding links at the lower order levels as the inherent link number.

Link numbers are explained in further detail in ref-erence to an example shown in FIG. 12. It is to be noted that, in order to facilitate understanding, the explanation will be given on the data at levels 6, 4, 2 and 0 among the seven levels, i.e., levels 6 0. When the link string 1 at the highest order level 6 comprises one link assigned with link number 1, the link with the link number 1 at the highest order level 6 comprises two links sharing the identical link number 1 at level 4. The identical link at the highest order level 6 is constituted of the two links assigned with the link number 1 constituting the link string 1 and a link with the link number 1 which consti-tutes the link string 2 at level 2, whereas the link string is constituted of a link with the link number 1 constituting the link string 1, a link with the link number 1 constituting the link string 2 and two links with the link number 1 con-stituting the link string 3 at level 0.

By using a link number identical to that used at a higher order level for the link number of links at lower order levels that correspond to links at the higher order levels in this manner, the correspondence among iden-tical link strings at different levels and the correspond-ence of identical link strings in the map display data and the route search data are facilitated, thereby achieving a reduction in processing time. [2] Route search data

The route search data include a plurality of sets of data corresponding to a plurality of sets of roadmap dis-play data for different scales, and the data for each scale are referred to as level m (m, may be, for instance, 2, 4) data. In addition, as explained before in this embodi-ment, identical links at different levels are managed through identical link number to facilitate correspond-ence of data at different levels and the correspondence with the roadmap display data.

FIG. 13 shows the data structure of route search data. As shown in the figure, in the route search data, node information that indicates the connecting relation-ship with other nodes is stored for each connecting point (node) of links, which are the minimum units for express-ing a road physical form. Each set of node information is constituted with home node information and adjacent node information, with the node positional coordinates stored in the home node information. In the adjacent node information, as shown in the figure, the adjacent node no., the link no. from the home node to the adjacent node, the link cost of the link and traffic regulation infor-mation on that link are stored. Also, various sets of node information are stored in the order of link connections and the node no. of the home node can be ascertained by the order in which it is stored. Because of this, even

without storing the node nos. of the home nodes as home node information, the node nos. of the home nodes can be ascertained, achieving a reduction in memory requirement.

### [3] Recommended route data

FIG. 14 shows an outline of the data structure of recommended route data which represent a recommended route from a point of departure to a destination which has been searched based upon the route search data. In the recommended route data, node information and link information on the recommended route are stored, while classified in units of mesh ranges. It is to be noted that a mesh range refers to a partitioned range when a roadmap is partitioned into units of specific ranges.

As shown in FIG. 14, the recommended route data are constituted with a mesh code, the number of nodes, node information, the number of link classifications, link information, ferry information and tunnel information. The number for identifying the mesh range is stored in the storage area for the mesh code, the number of nodes present within a mesh range is stored in the storage area for the number of nodes and, as shown in detail in FIG. 15A, the node no., the positional coordinates, the distance cost and the like of each node within a mesh range are stored in the storage area for the node information. In addition, the number of link classifications that are present inside a mesh range is stored in the storage area for the number of link classifications and, as shown in detail in FIG. 15B, the link classification, the number of links, the link no. and the like of each link within a mesh range are stored in the storage area for the link information. FIG.s 15A and 15B illustrate a case in which there are two link strings 1 and 2 within the area indicated by the same mesh code.

It is to be noted that, as explained above, recommended route data are prepared at different levels and, in this embodiment, recommended route data at level 2 are prepared for the vicinities of the start point and the end point on the recommended route while recommended route data at level 4 are prepared for the middle range between the start point and the end point.

The following is an explanation of the operation performed in this embodiment in reference to the flowchart, and in this embodiment, the recommended route is displayed on the display device 6 in the following manner. The recommended route is searched by using the route search data at level 4 and level 2 to create recommended route data at level 4 and level 2, and then, the recommended route data at level 4 is converted into recommended route data at level 2, and then based upon the recommended route data at level 2 and the roadmap display data at level 2 and level 1, the recommended route is drawn and superimposed upon the roadmap at level 2 or level 1, which is displayed on the display device 6, with the recommended route highlighted with a

red bold line, for instance.

FIGS. 16 and 17 are a flow chart illustrating the outline of the main processing performed by the control circuit 2. In step S1 in FIG. 16, the vehicle position is detected by the current position detection apparatus 1. In step S2, the destination, which has been input via the input device 3, is read in. In step S3, based upon the map display data stored in the map database apparatus 8, the start point and the end point of the route search are set on roads for which route search is possible. For instance, the start point of a vehicle may be the current position of the vehicle (vehicle position) and the end point is the destination.

In step S4, using route search data at level 2, route search in the vicinity of the start point of the route search is performed, and a plurality of candidates for the recommended route in the vicinity of the start point are selected. In step S5, using route search data at level 2, route search in the vicinity of the end point of the route search is performed, and a plurality of candidates for the recommended route in the vicinity of the end point are selected.

In step S6, using route search data at level 4, route search is performed for routes between the candidates for the recommended routes selected in step S4 and step S5, and a recommended route from the start point to the end point is calculated.

Route search data at different levels are used for the vicinities of the start point and the end point, and the middle range between the start point and the end point in this manner because if route search is performed using route search data at level 2 for the entire route, the data quantity will be very large and, as a result, the calculation time required in route search will increase. In step S7, the information related to the recommended route calculated in step S6 is stored in the SRAM 7 as recommended route data.

When the processing performed in step S7 in FIG. 16 is completed, the operation proceeds to step S8 shown in FIG. 17, in which the background map drawing processing, the details of which are shown in FIG. 18, is performed to draw (store) data related to the roadmap in the vicinity of the recommended route in the image memory 5 for display on the display device 6. First, in step S11 in FIG. 18, map display data corresponding to the vicinity of the current vehicle position are read from the map database apparatus 8. Next, in step S12, a portion of the map display data thus read, is drawn (stored) in the image memory 5.

When the processing performed in step S12 in FIG. 18 is completed, the operation proceeds to step S9, shown in FIG. 17, in which the data required to display the recommended route calculated in step S3 are also drawn over (stored) in the image memory 5. The recommended route drawing processing performed in step S9 is described in more detail later. In step S10, the data stored in the image memory 5 are read out and the recommended route and the roadmap in the vicinity are dis-

played on the display device 6.

FIG. 19 is a detailed flowchart illustrating the recommended route drawing processing performed in step S9 in FIG. 17. In step S51 in FIG. 19, the display range for the recommended route is set in correspondence to the roadmap range displayed on the display device 6. In step S52, a decision is made as to whether or not the display range for the recommended route is included within the range over which the route search has been performed using the route search data at level 4. If a negative decision is made, the operation proceeds to step S54, whereas if an affirmative decision is made in step S52 in FIG. 19, the operation proceeds to step S53 to convert the recommended route data at level 4 stored in the SRAM 7 to recommended route data at level 2. This conversion processing is to be detailed later.

Step S54 follows step S52 or step S53 in FIG. 19, and a decision is made as to whether the display scale of the roadmap is set at (1/10,000 or 1/20,000) or (1/40,000 or 1/80,000). If the setting is at (1/10,000 or 1/20,000), the operation proceeds to step S55, in which the recommended route is drawn over (superimposed) in the image memory 5, based upon the recommended route data at level 2 and, the road type and link numbers of the map display data at level 1.

If, on the other hand, a decision is made in step S54 that the scale is set at (1/40,000 or 1/80,000), the operation proceeds to step S56, in which the recommended route is drawn over in the image memory 5 based upon the recommended route data at level 2, and the road type and link numbers of the map display data at level 2.

As shown in FIGs. 13 and 14, the route search data and the recommended route data in this embodiment hold only the connection information on link connections and do not hold information in regard to road physical form. Consequently, in order to draw a recommended route superimposed upon the roadmap on the monitor, it is necessary to extract the physical form data from the roadmap data based upon the recommended route data.

FIG. 20 illustrates the procedure that is followed in order to display the recommended route on the monitor based upon the recommended route data.

FIG. 20A shows recommended route data at level 4 in which the link 1 constituting the link string 1 is present between the front end node N0 and the rear end node N1. FIG. 20B illustrates the recommended route data at level 2 and recommended route display data at level 2 for drawing the physical form data which are extracted from the roadmap display data at level 2 based upon the recommended route data at level 2, superimposed in the image memory 5. In FIG. 20B the link string 1 of the recommended route data at level 2 comprises the link 1 located between the nodes N0 and Na and the link 1 located between the nodes Na and N1. FIG. 20C illustrates the recommended route display data at level 1 for drawing the physical form data which are extracted

from the roadmap display data at level 1 based upon the recommended route data at level 2, superimposed in the image memory 5.

When the operation proceeds from step S54 to step S56 in FIG. 19, i.e., when drawing the recommended route on the roadmap at level 2 based upon the recommended route data at level 2, the coordinate values of the node N0, the interpolation point Hb, the node Na, the interpolation point Hc and the node N1 constituting the link string 1, as shown in FIG. 20B, are read out by referencing the roadmap display data at level 2, with common link number 1, the start node N0 and the end node N1 of the link string 1 used as pointers. It is desirable to search the map display data within identical mesh code as the mesh code of the recommended route data in order to reduce processing time. Then, the link string comprising two links with the link number 1 in the recommended route data is drawn on the road map at level 2 which is drawn in the image memory 5.

When the operation proceeds from step S54 to step S56 in FIG. 19, i.e., when drawing the recommended route on the roadmap at level 1 based upon the recommended route data at level 2, the coordinate values of the node N0, the interpolation point Hd, the interpolation point He, the node Nb, the interpolation point Hf and the node Nc constituting the link string 1 and the coordinate values of the node Nc, the interpolation point Hg, the interpolation point Hh, the interpolation point Hi and the node N1 constituting the link string 2, as shown in FIG. 20C, are read out by referencing the roadmap display data at level 1, with common link number 1 of the two links, the start node N0 and the end node N1 of the link string 1 used as pointers. As explained before, it is desirable that mesh code at level 1 is obtained based upon mesh code of the recommended route data at level 2, then the map display data is searched within identical mesh code as the mesh code of the recommended route data in order to reduce processing time. Then, the link string comprising two links of link 1 in the recommended route data is drawn on the roadmap at level 1 drawn in the image memory 5.

It is to be noted that the processing through which the recommended route data at level 4 are converted to recommended route data at level 2 performed in step S53, is implemented by referencing the route search data at level 2 with the link number 1 assigned to one link in the recommended route data at level 4 and the start node N0 and the end node N1 of the link string 1 shown in FIG. 20A used as pointers. It is desirable to perform a search within the mesh code at level 2 which is specified by the mesh code at level 4 in order to reduce the processing time.

In contrast, in a map database apparatus in the prior art, the route search data hold the address offset information for the route display data, as shown in FIG. 24, instead of the inherent link number as in the present invention, and the physical form data are added to the recommended route data, which do not have any physical

form data, to create route display data which are superimposed upon the roadmap at the same level in image memory for drawing. For instance, in the prior art, the route search data hold address offset information 01 for the map display data at the same management level and address offset information 02 for the map display data at the lower order level in regard to a route that connects the home node and an adjacent node N1. Because of this, a problem exists in that the quantity of route search data is large. The address offset information 01 refers to the address in the roadmap display data at the same level, i.e., level 4, where the positional coordinates of the home node N0 are stored in memory and the address offset information 02 - 05 indicate addresses in the roadmap display data at the lower order level, i.e., level 2, where the positional coordinates of the home node N0 are stored in memory.

Thus, since the road physical form is detected from the roadmap display data by using the identical link number, the start node and the end node of the identical link at each level in the recommended route data as pointers in this embodiment, it is not necessary to provide address offset information for route display data in the route search data and neither is it necessary to provide road data to be used exclusively for the route display, thereby achieving a reduction in the quantity of route search data compared to the quantity of route search data in the prior art.

In addition, since, when drawing the recommended route data at level 2 superimposed upon a display map at level 1, the physical form data are directly read out from the roadmap display data at level 1 by using the inherent level numbers shared among individual levels without creating recommended route data at level 1, the processing time is reduced. It is to be noted that as explained above, the processing time can be further reduced by performing a data search only within a mesh code in the roadmap display data specified by the mesh code of the recommended route data.

display data at a second scale that is larger than said first scale, reads out physical form data of said recommended route data obtained by performing said search using said route search data at said first scale based upon said map display data at said second scale and displays said physical form data superimposed upon said roadmap on the monitor.

2. A navigation system according to claim 1, wherein: links in said map display data and said route search data at said second scale that are identical to links in said map display data and said route search data at said first scale are assigned with identical link numbers as those assigned to said links in said map display data and said route search data at said first scale.
3. A navigation system according to claim 2 wherein: said control apparatus searches said map display data at said second scale based upon link numbers of links in said recommended route data at said first scale and extracts physical form data of links sharing common link numbers.

## Claims

1. A navigation system comprising:

a database apparatus provided with map display data constituted of data representing road positions and physical forms provided in separate sets to correspond to different scales and route search data constituted of data representing connection states of one road connecting with another road provided in separate sets to correspond to different scales; and a control apparatus that, when displaying recommended route data obtained by performing a search using said route search data at a specific first scale superimposed upon a roadmap that is displayed on a monitor based upon map



FIG. 1

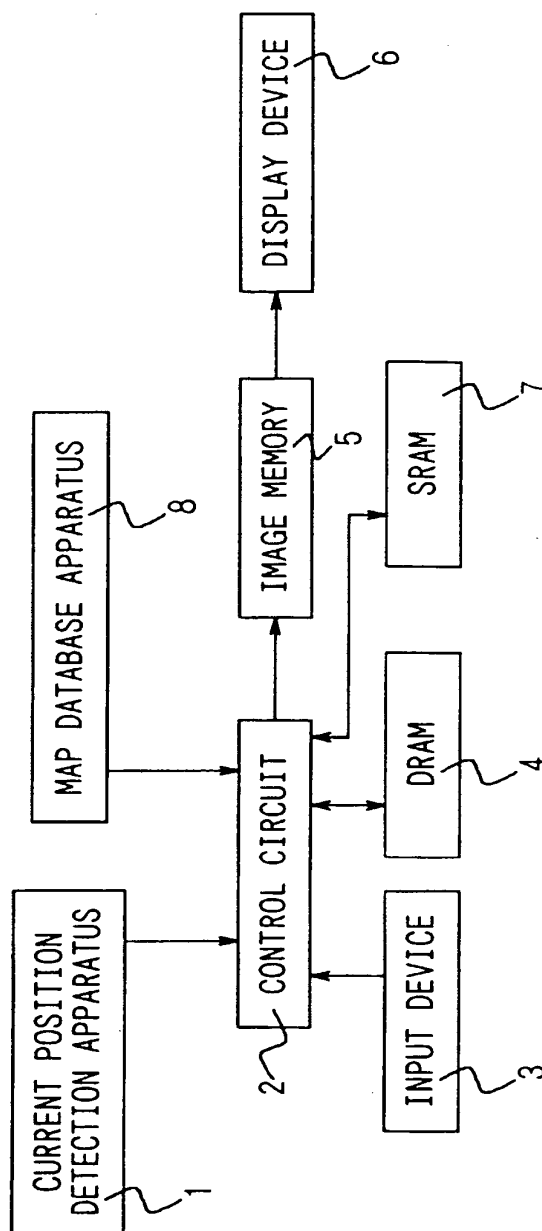


FIG. 2

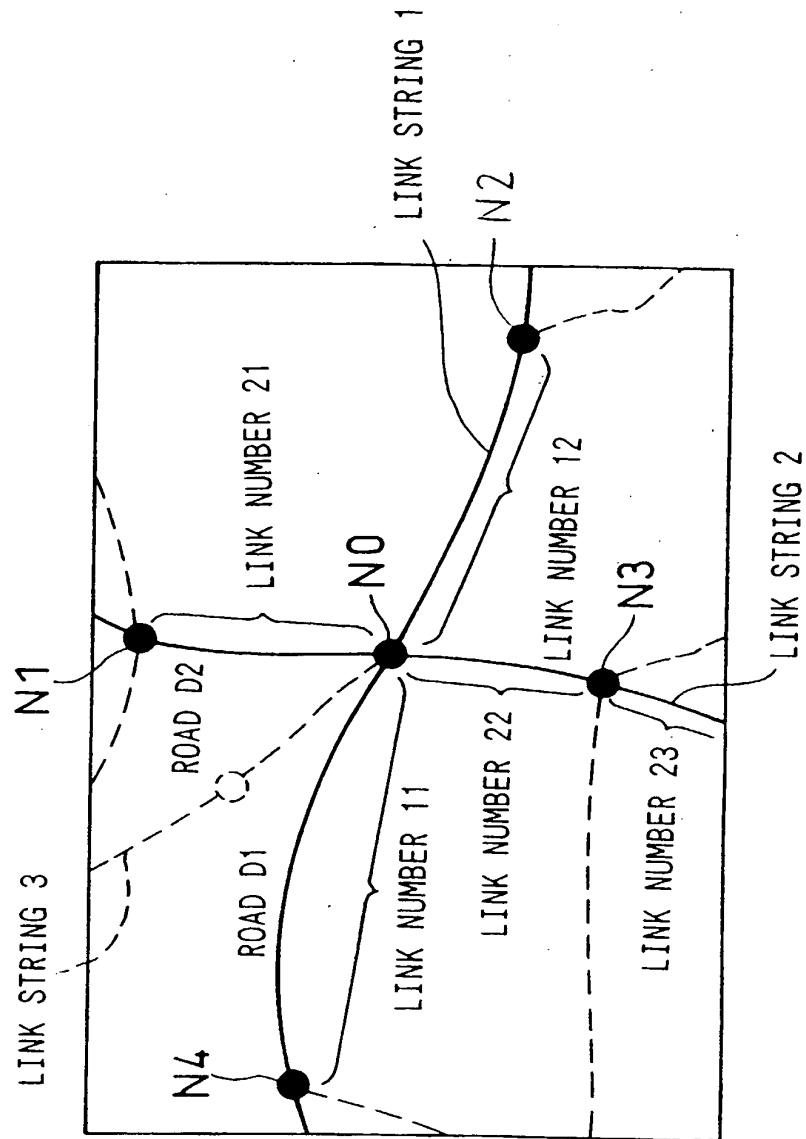


FIG. 3

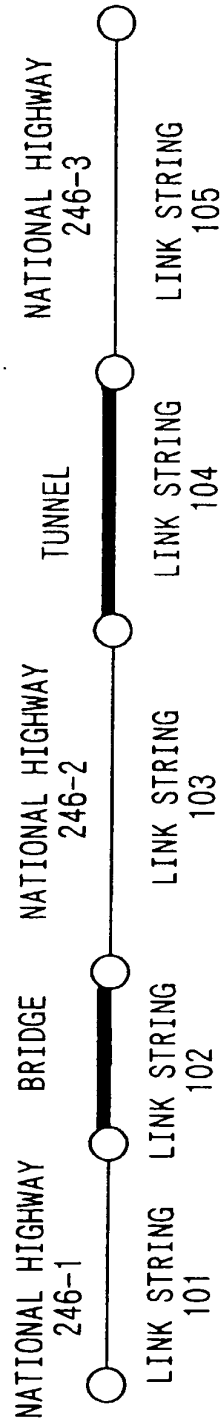


FIG. 4

ITEM NAME		
LINK STRING 1	LINK STRING INFORMATION	LINK STRING SIZE
		NUMBER OF ELEMENT POINTS
		LINK ATTRIBUTE
		ROAD NAME OFFSET
		ROAD NUMBER
	NODE LINK INFORMATION	ATTRIBUTE 1 + X COORDINATE
		ATTRIBUTE 2 + Y COORDINATE
		(IDENTICAL NODE OFFSET)
		(GUIDE OFFSET)
		(LINK NUMBER)
		⋮
		ATTRIBUTE 1 + X COORDINATE
		ATTRIBUTE 2 + Y COORDINATE
		(IDENTICAL NODE OFFSET)
		(GUIDE OFFSET)
		(LINK NUMBER)
		ALTITUDE INFORMATION
		⋮
		ALTITUDE INFORMATION
⋮		
LINK STRING n	LINK STRING INFORMATION	
	NODE LINK INFORMATION	

FIG. 5

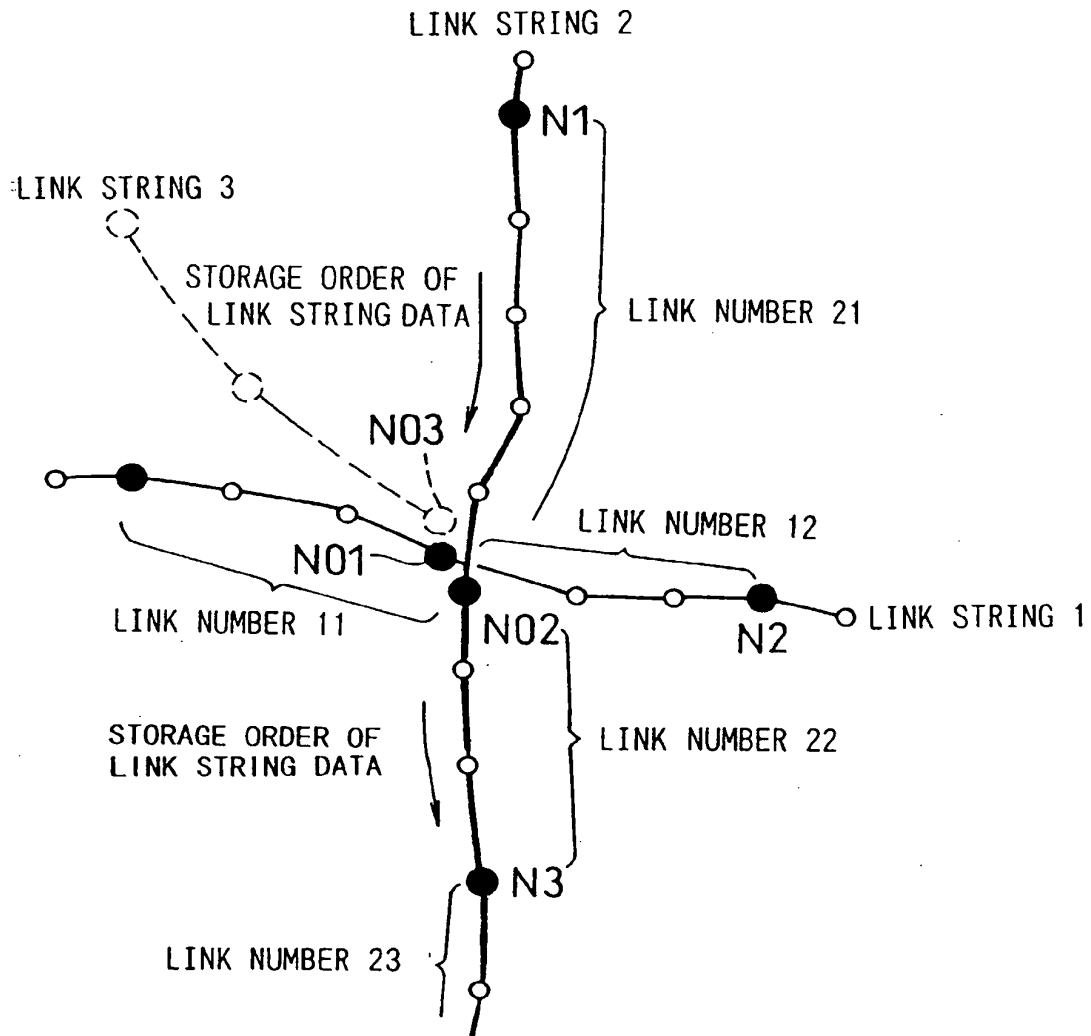


FIG. 6

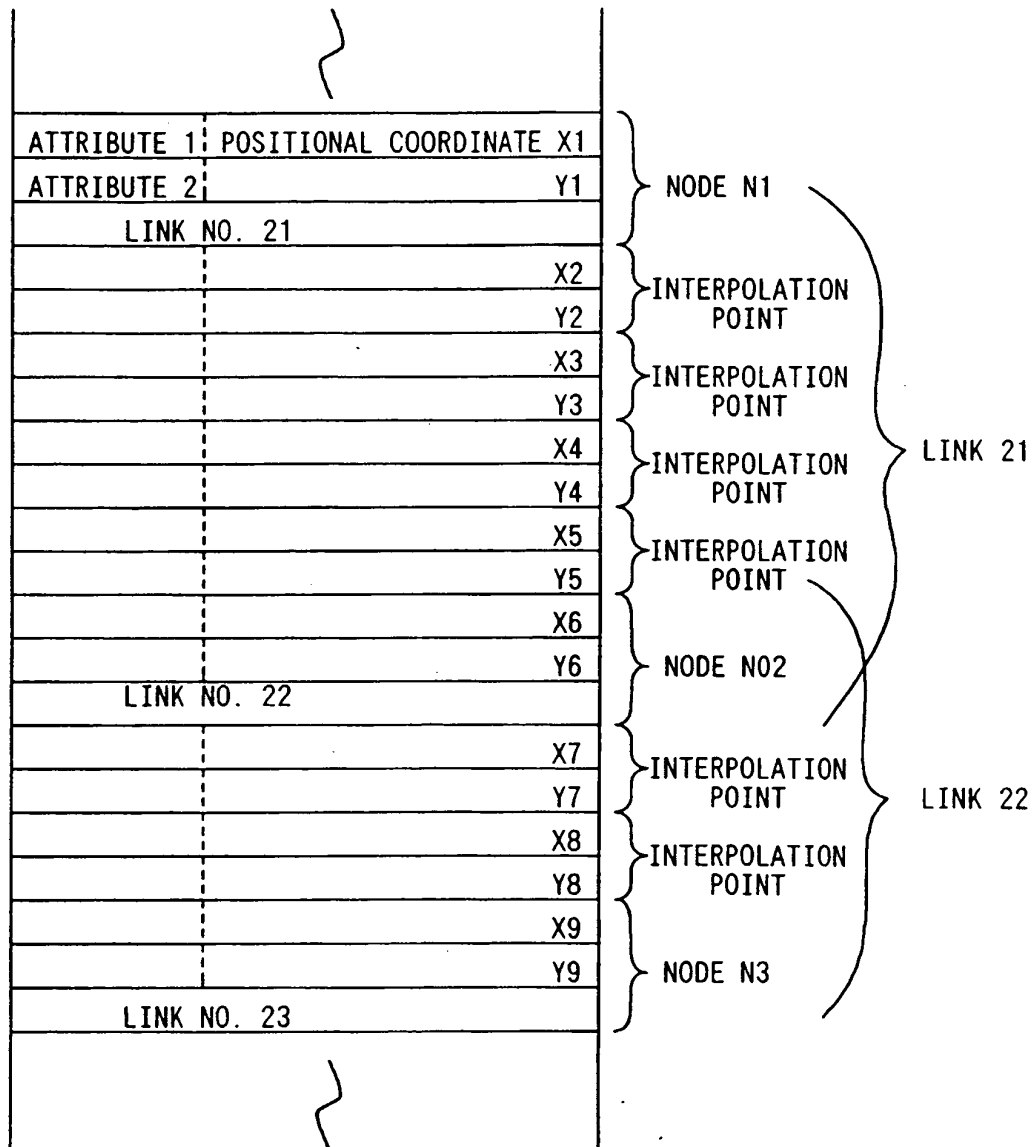


FIG. 7

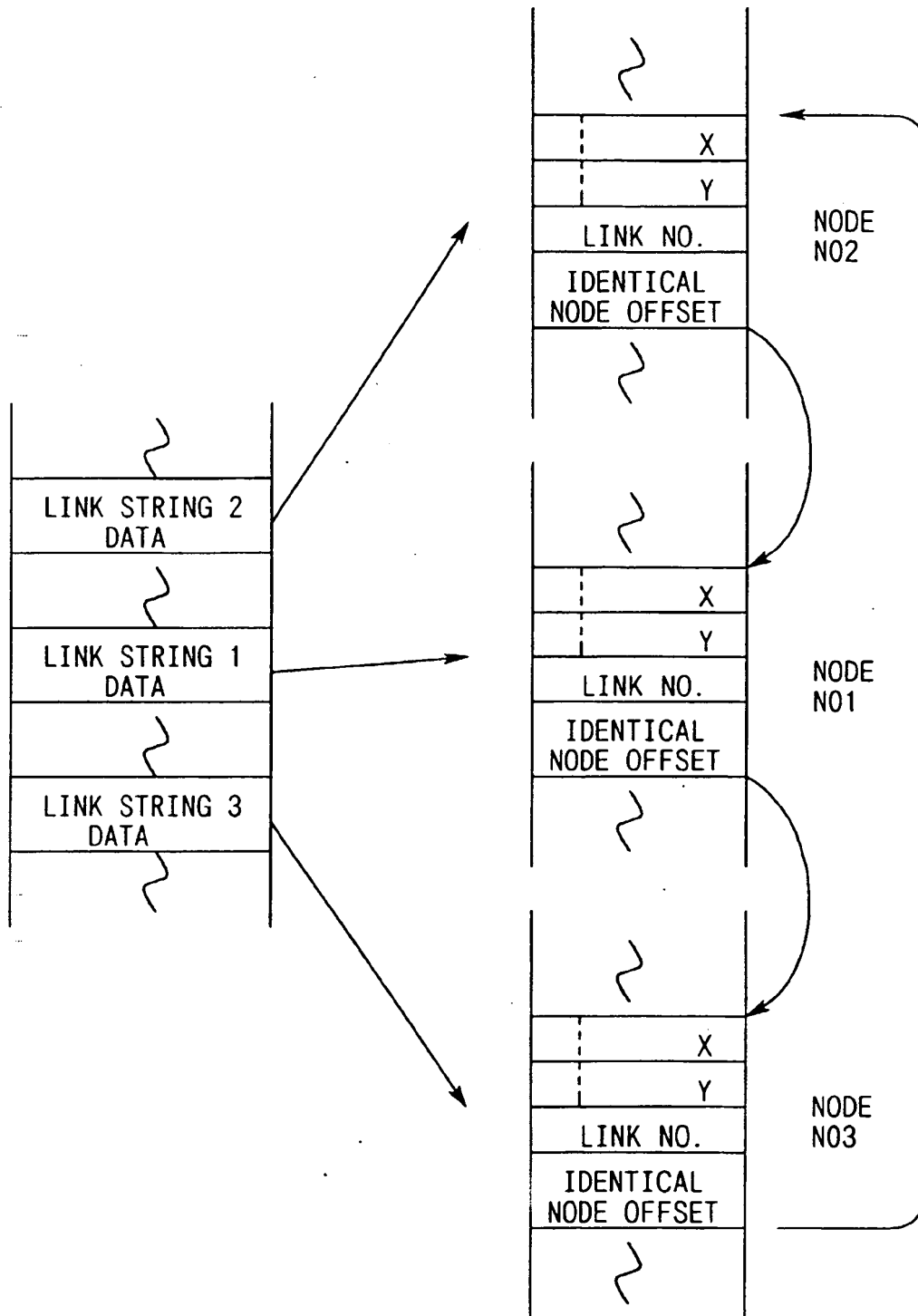


FIG. 8

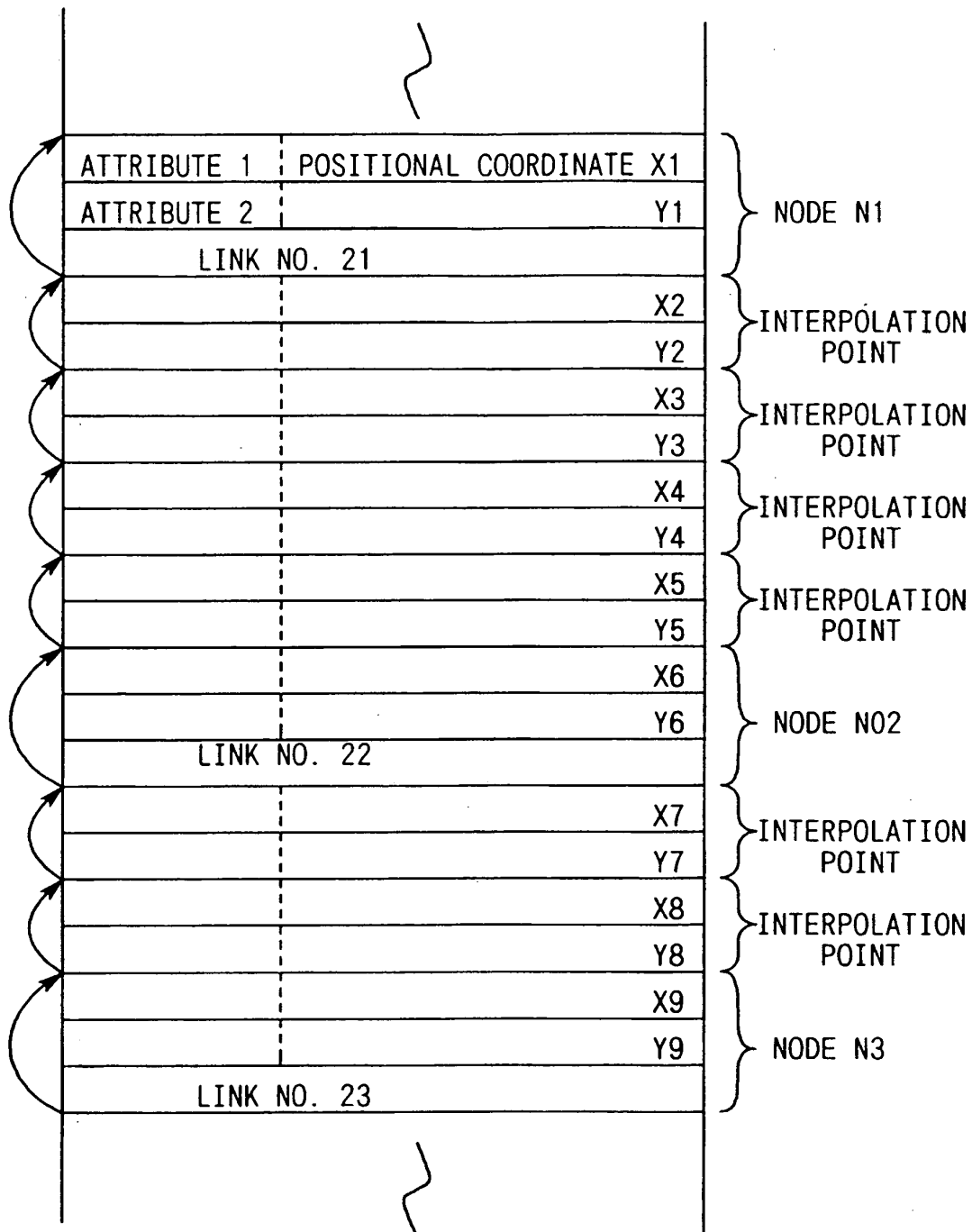




FIG. 9A

ATTRIBUTE 1 + X COORDINATE
ATTRIBUTE 2 + Y COORDINATE

(2 WORDS)

FIG. 9B

ATTRIBUTE 1 + X COORDINATE
ATTRIBUTE 2 + Y COORDINATE
IDENTICAL NODE OFFSET

(3 WORDS)

FIG. 9C

ATTRIBUTE 1 + X COORDINATE
ATTRIBUTE 2 + Y COORDINATE
IDENTICAL NODE OFFSET
GUIDE OFFSET (OR LINK NO.)

(4 WORDS)

FIG. 9D

ATTRIBUTE 1 + X COORDINATE
ATTRIBUTE 2 + Y COORDINATE
IDENTICAL NODE OFFSET
GUIDE OFFSET
LINK NO.

(5 WORDS)

FIG. 10A

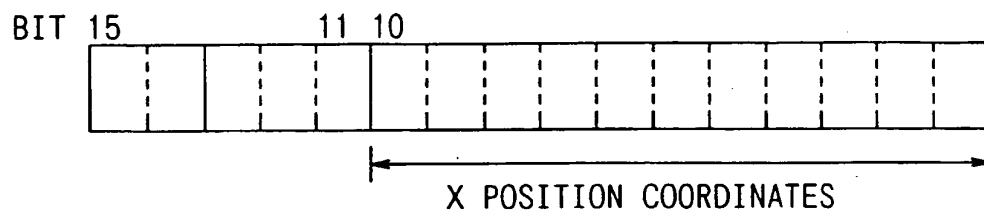


FIG. 10B

BIT	DETAILS
15, 14	OFFSET TO IMMEDIATELY PRECEDING
	(1) 2 WORDS UP TO THE HEADER POSITION OF THE IMMEDIATELY PRECEDING ELEMENT POINT
	(2) 3 WORDS UP TO THE HEADER POSITION OF THE IMMEDIATELY PRECEDING ELEMENT POINT
	(3) 4 WORDS UP TO THE HEADER POSITION OF THE IMMEDIATELY PRECEDING ELEMENT POINT
	(4) 5 WORDS UP TO THE HEADER POSITION OF THE IMMEDIATELY PRECEDING ELEMENT POINT

FIG. 11A

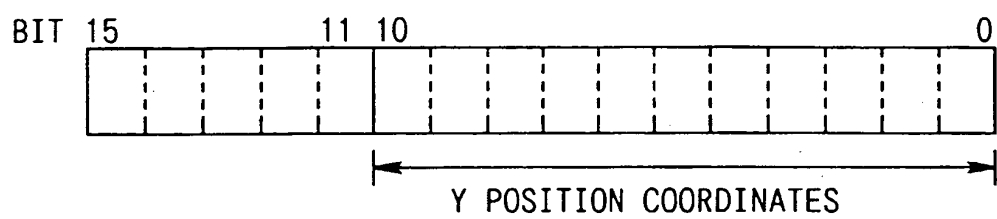


FIG. 11B

BIT	DETAILS	
15 - 11	ONE-WAY TRAFFIC	① NO ONE-WAY ROAD
		② ONE-WAY TRAFFIC IN FORWARD DIRECTION *1
		③ ONE-WAY TRAFFIC IN REVERSE DIRECTION *2
		④ NO TRAFFIC IN BOTH DIRECTIONS *3
	CLASSIFICATIONS OF WIDTHS *4	⑤ LESS THAN 5.5m OR NOT KNOWN
		⑥ 5.5 THROUGH 13m (OR ONE THROUGH 2 LANES)
		⑦ 13m OR MORE (OR THREE THROUGH 4 LANES)
		⑧ 5 THROUGH 6 LANES OR MORE

- \*1 1-WAY TRAFFIC IN THE FORWARD DIRECTION MEANS THAT TRAVELING IS ALLOWED ONLY IN THE DIRECTION WHICH CONFORMS TO THE ORDER IN WHICH LINK STRING DATA POINTS ARISE.
- \*2 1-WAY TRAFFIC IN THE REVERSE DIRECTION MEANS THAT TRAVELING IS ALLOWED ONLY IN THE DIRECTION WHICH IS REVERSE FROM THE ORDER IN WHICH LINK STRING DATA POINTS ARISE.
- \*3 NO TRAFFIC ALLOWED IN BOTH DIRECTIONS MEANS THAT TRAVELING IS NOT ALLOWED EITHER IN THE DIRECTION CONFORMING TO THE ORDER IN WHICH THE LINK STRING DATA POINTS ARISE OR IN THE DIRECTION THAT IS REVERSE.
- \*4 THE TOTAL NUMBER OF LANES FOR BOTH FORWARD AND REVERSE DIRECTIONS IS INDICATED AS THE NUMBER OF LANES. WHEN FORWARD DIRECTION LANES AND REVERSE DIRECTION LANES ARE SEPARATED, THE NUMBER OF LANES IS INDICATED SEPARATELY FOR THE FORWARD DIRECTION AND REVERSE DIRECTION.

FIG. 12

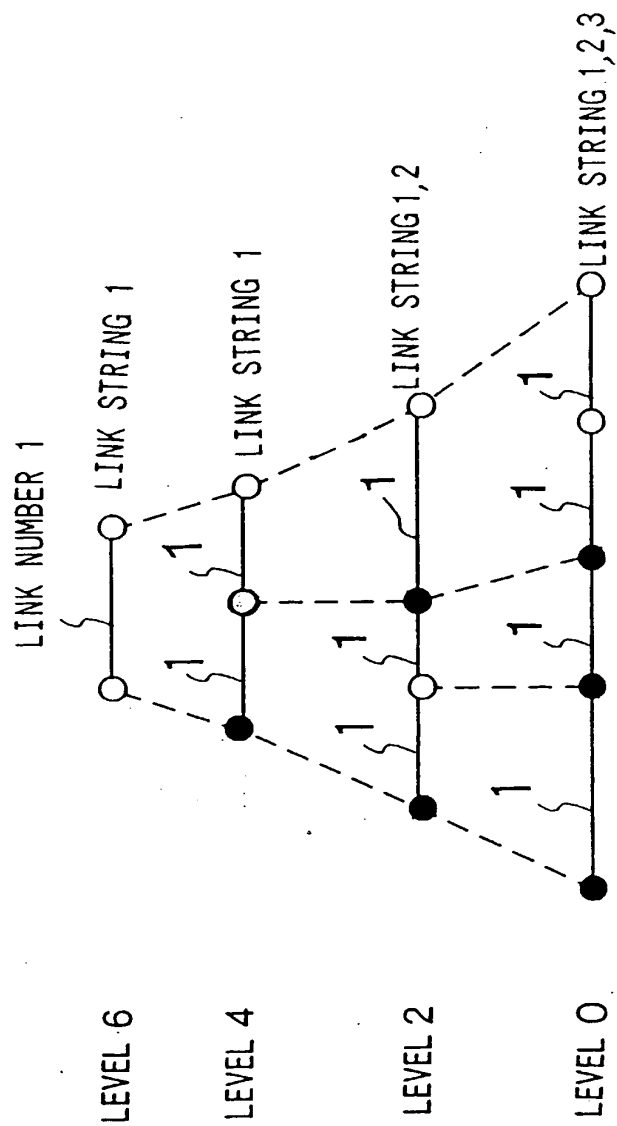


FIG. 13

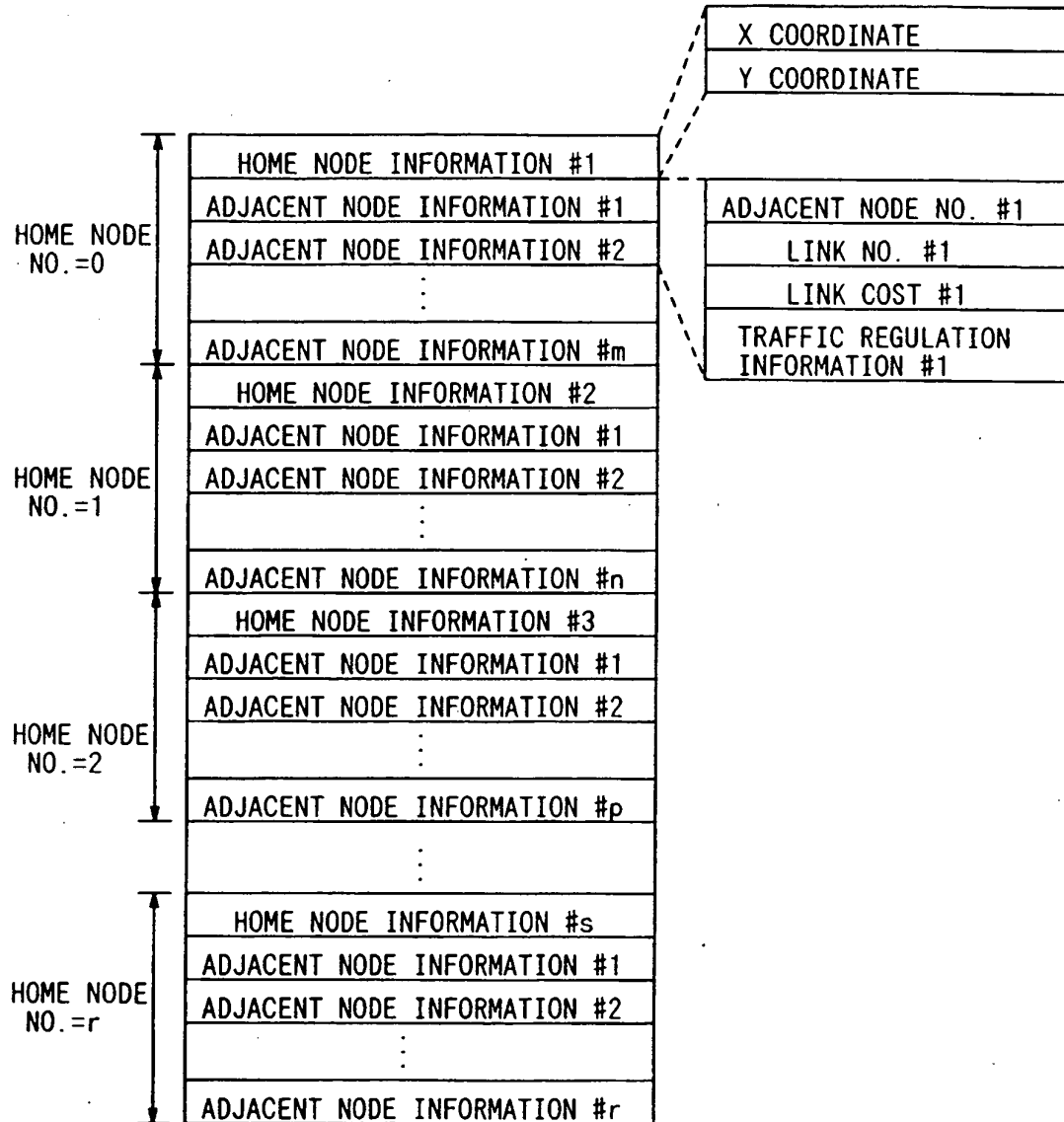
STRUCTURE OF ROUTE SEARCH DATA

FIG. 14

STRUCTURE OF RECOMMENDED ROUTE DATA

.
.
.
.
.
MESH CODE
NUMBER OF NODES
NODE INFORMATION
NUMBER OF LINK CLASSIFICATIONS
LINK INFORMATION
FERRY INFORMATION
TUNNEL INFORMATION
.
.
.
MESH CODE
.
.
.
.
.



NODE INFORMATION AND LINK INFORMATION  
IN RECOMMENDED ROUTE DATA

FIG. 15A

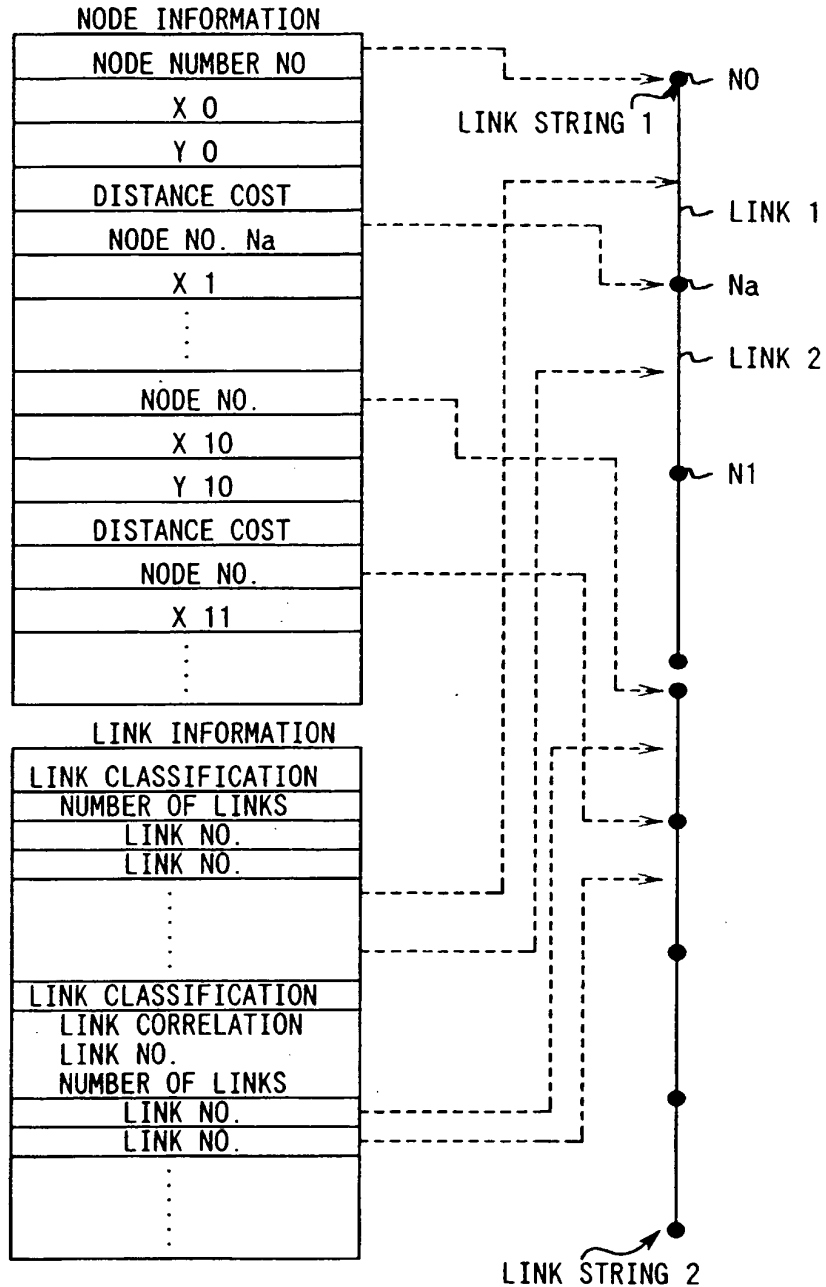


FIG. 15B

FIG. 16

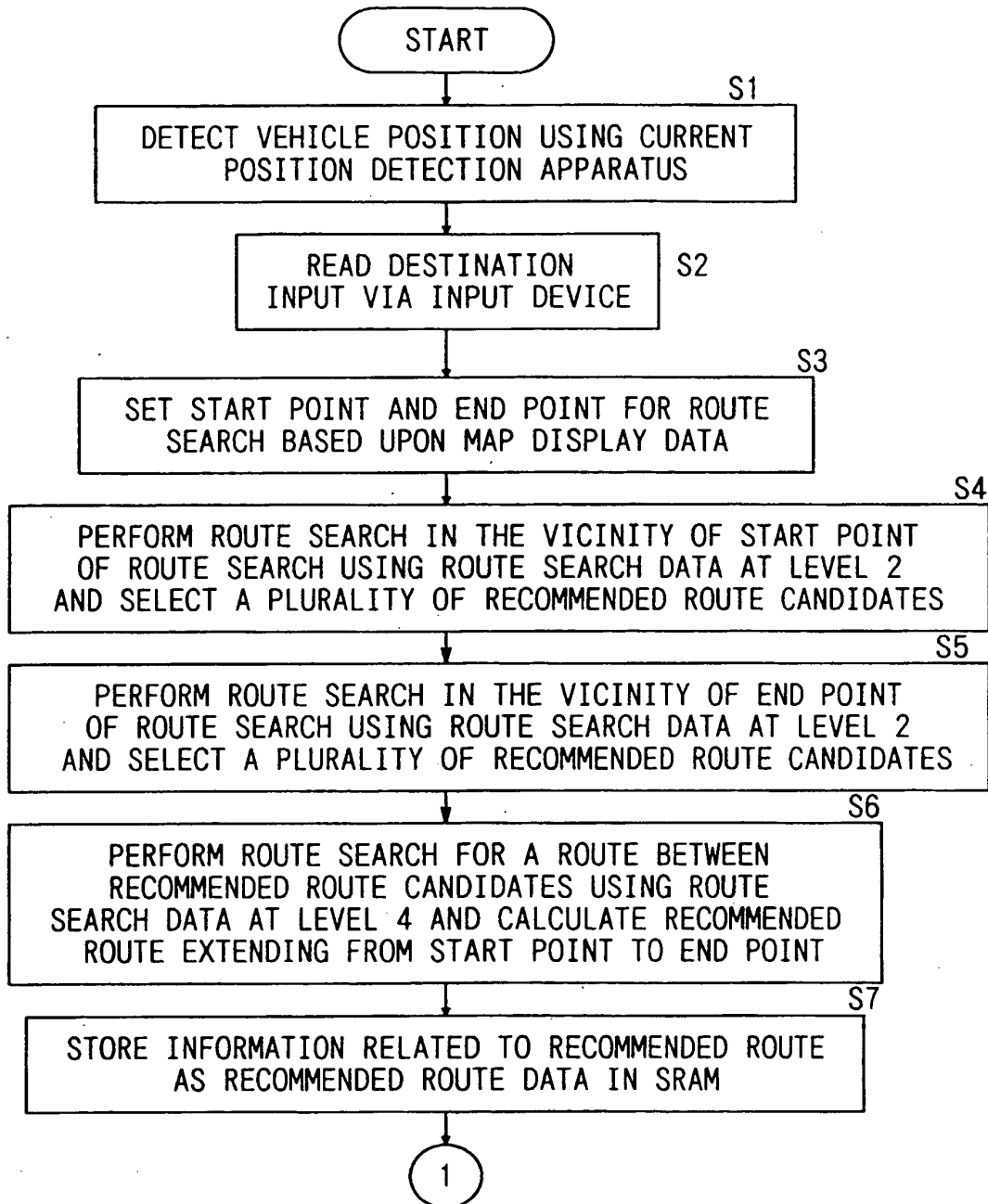


FIG. 17

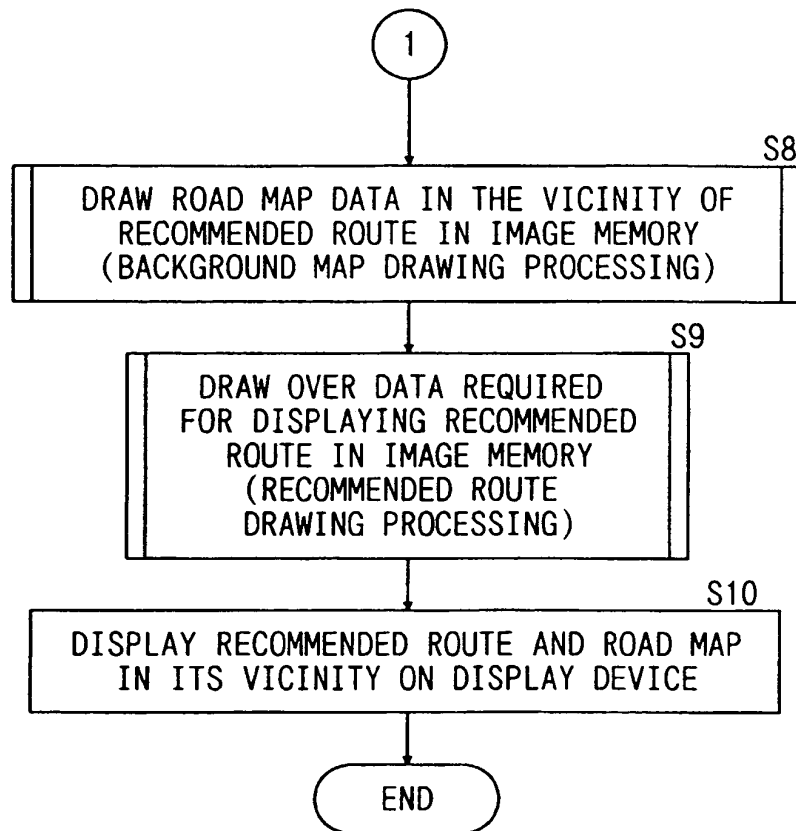


FIG. 18

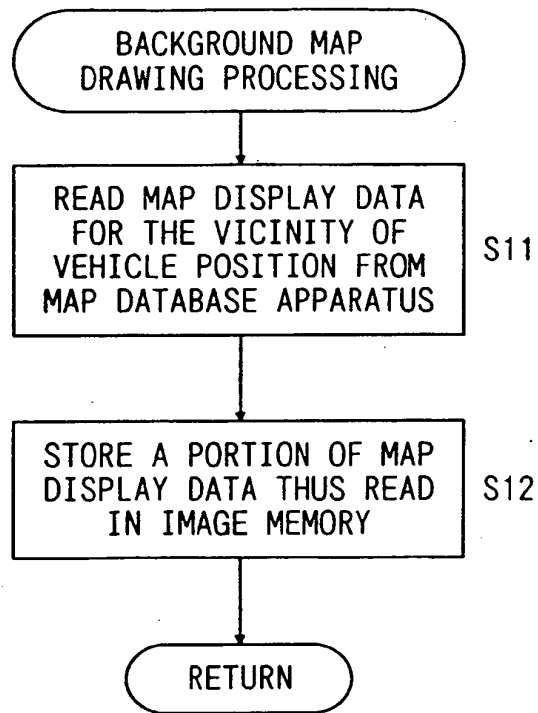
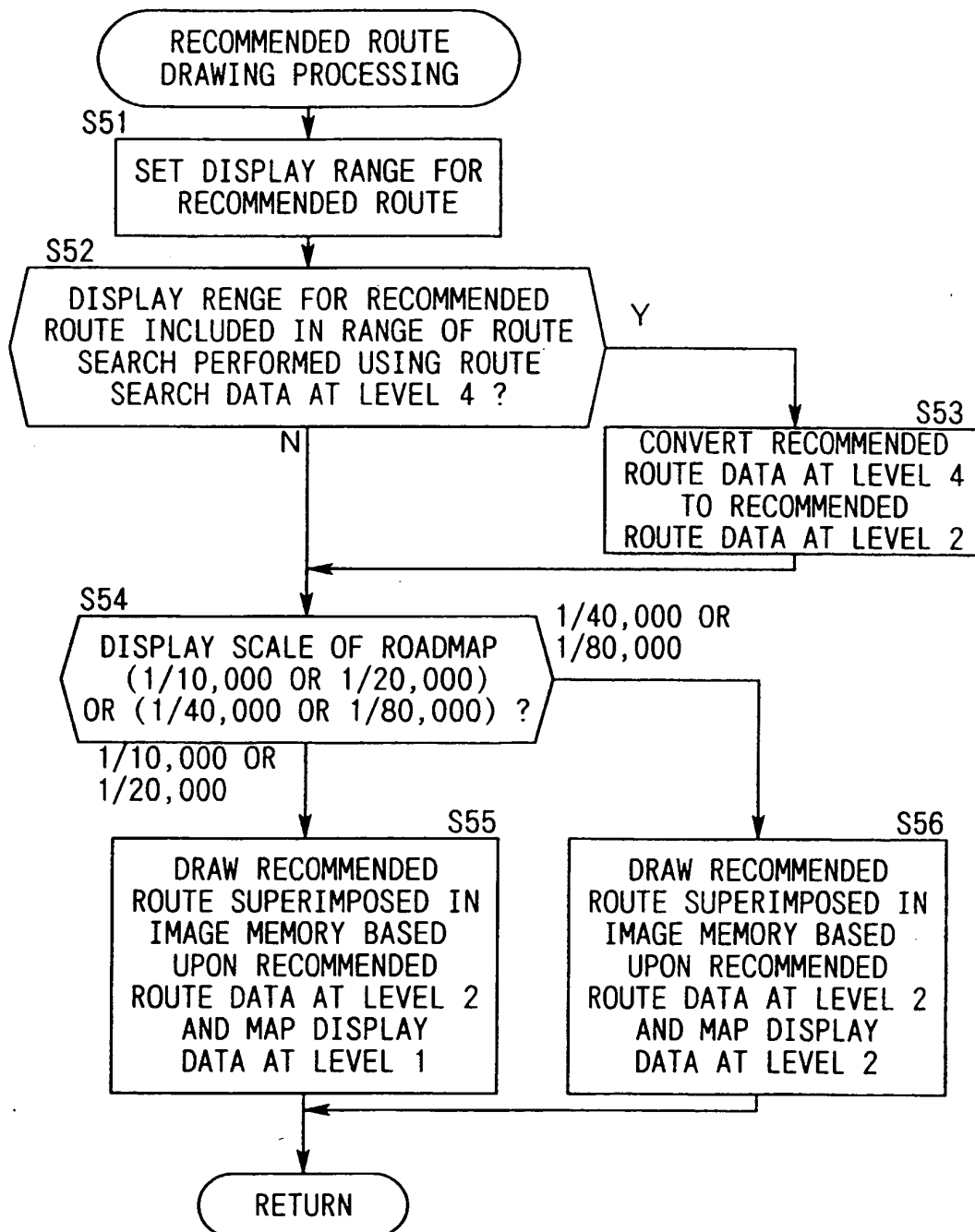
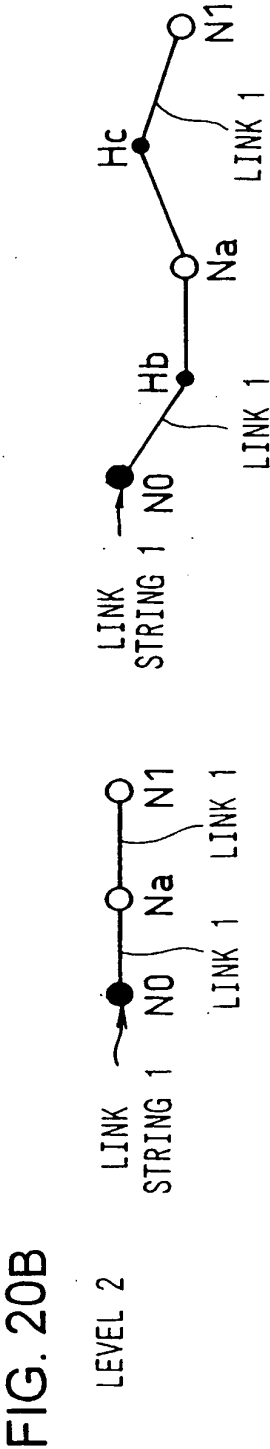
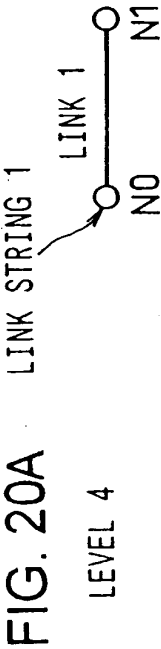


FIG. 19





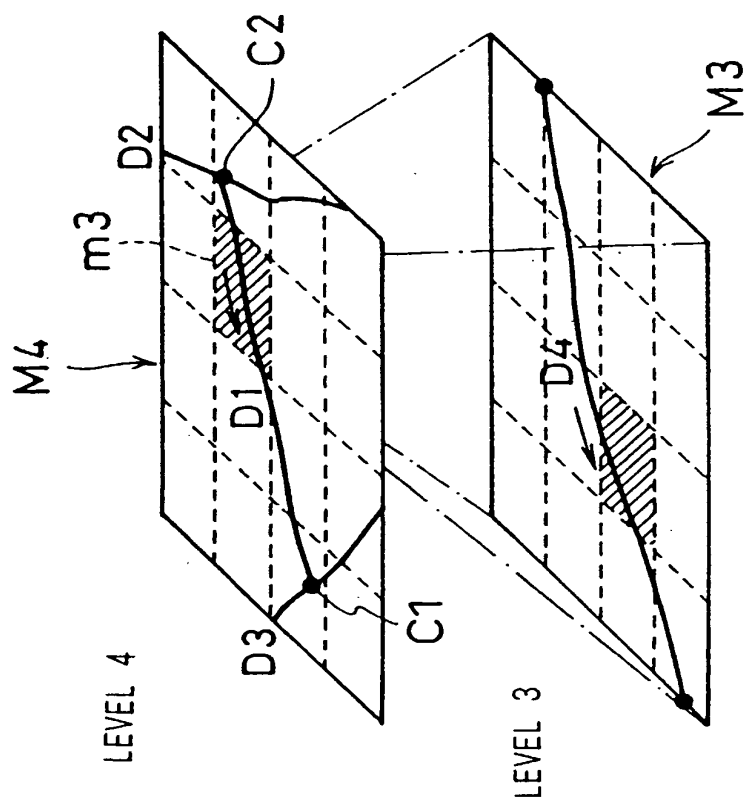


FIG. 21A

FIG. 21B

FIG. 22

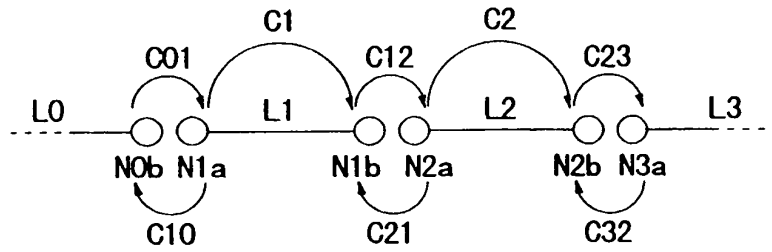


FIG. 23

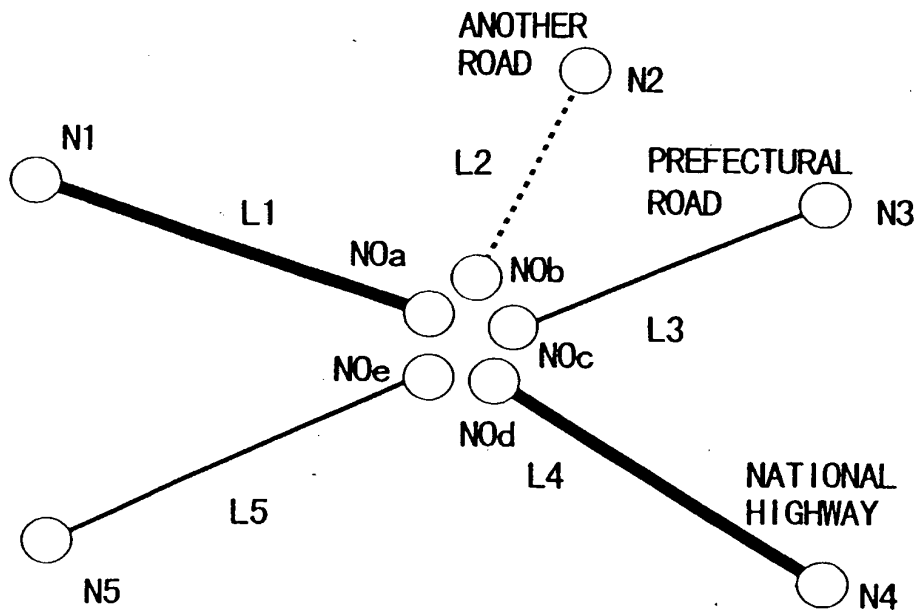
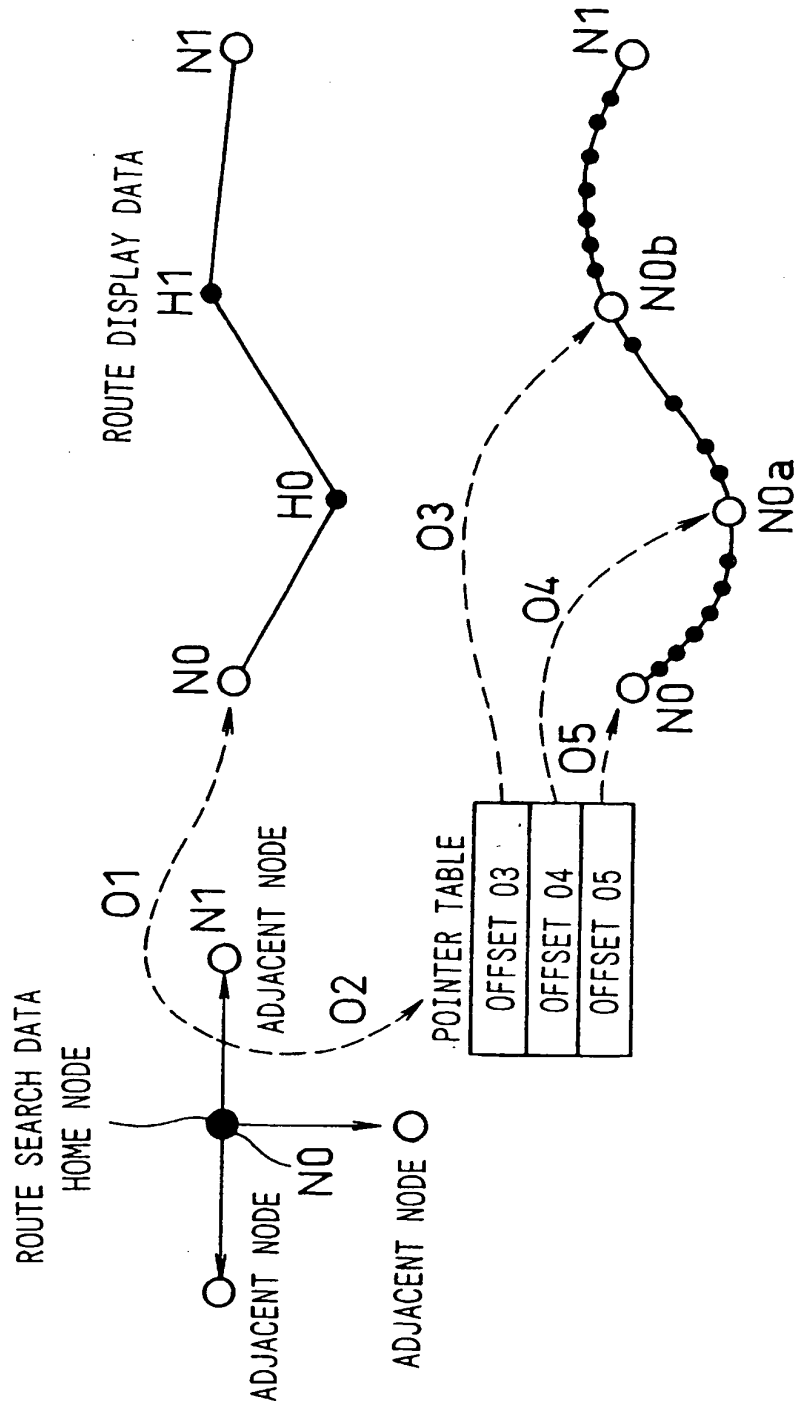
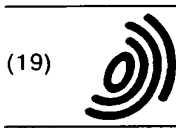




FIG. 24





Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11)

EP 0 838 662 A3

(12)

## EUROPEAN PATENT APPLICATION

(88) Date of publication A3:  
18.11.1998 Bulletin 1998/47

(51) Int Cl.<sup>6</sup>: G01C 21/20

(43) Date of publication A2:  
29.04.1998 Bulletin 1998/18

(21) Application number: 97308378.5

(22) Date of filing: 22.10.1997

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

(72) Inventor: Nomura, Takashi,  
Xanavi Informatics Corporation  
Zama-shi, Kanagawa, 228 (JP)

(74) Representative: Read, Matthew Charles et al  
Venner Shipley & Co.  
20 Little Britain  
London EC1A 7DH (GB)

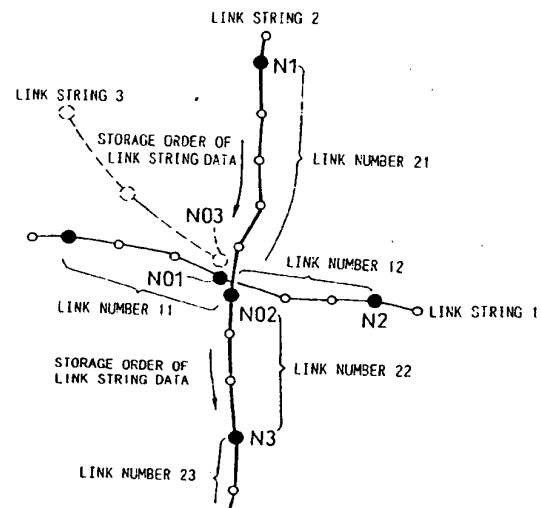
(30) Priority: 22.10.1996 JP 279686/96

(71) Applicant: Xanavi Informatics Corporation  
Zama-shi, Kanagawa 228 (JP)

### (54) Navigation system

(57) A navigation navigation system according to the present invention comprises: a database apparatus provided with map display data constituted of data representing road positions and physical forms provided in separate sets to correspond to different scales and route search data constituted of data representing connection states of one road connecting with another road provided in separate sets to correspond to different scales; and a control apparatus that, when displaying recommended route data obtained by performing a search using the route search data at a specific first scale superimposed upon a roadmap that is displayed on a monitor based upon map display data at a second scale that is larger than the first scale, reads out physical form data of the recommended route data obtained by performing the search using the route search data at the first scale based upon the map display data at the second scale and displays the physical form data superimposed upon the roadmap on the monitor.

FIG. 5



EP 0 838 662 A3



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 97 30 8378

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 706 031 A (XANAVI INFORMATICS CORP ; HITACHI LTD (JP)) 10 April 1996 * the whole document *	1-3	G01C21/20
A	US 5 285 391 A (SMITH JR BERNARD C ET AL) 18 February 1994 * abstract *	1	
A	KAMIJO S ET AL: "DIGITAL ROAD MAP DATA BASE FOR VEHICLE NAVIGATION AND ROAD INFORMATION SYSTEMS" PROCEEDINGS OF THE VEHICLE NAVIGATION AND INFORMATION SYSTEMS CONFERENCE, (VNIS), TORONTO, SEPT. 11 - 13, 1989, no. CONF. 1, 11 September 1989, pages 319-323, XP000089898 REEKIE D; CASE E; TSAI J * page 321 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			G01C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 September 1998	Examiner Hoekstra, F
CATEGORY OF CITED DOCUMENTS		I : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date C : document cited in the application L : document cited for other reasons S : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 03/92 (PatCat)

# Patent Abstracts of Japan

PUBLICATION NUMBER : 08145708  
PUBLICATION DATE : 07-06-96

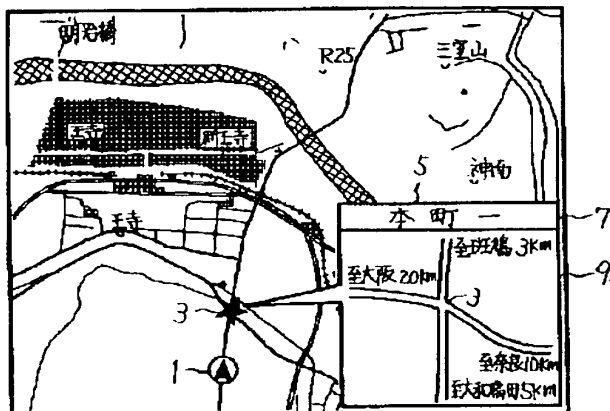
APPLICATION DATE : 21-11-94  
APPLICATION NUMBER : 06286600

APPLICANT : SUMITOMO ELECTRIC IND LTD;

INVENTOR : YAMAUCHI YUMIKO;

INT.CL : G01C 21/00 G08G 1/0969 G09B 29/00  
G09B 29/10

TITLE : NAVIGATION DISPLAY DEVICE



**ABSTRACT :** PURPOSE: To enable travel to the destination safely without anxiety and hesitation, without the switching operation of the scale of a map screen at a junction during driving.

CONSTITUTION: When an own vehicle approaches the junction of a road, a junction guide map 5 is displayed in a superposed space, in a map on the display screen of a navigation display device regardless of the scale of the map, in a position not disturbing path guidance so as not to hide the present position 1 of the vehicle, the junction 3, and the like. The name of the junction area is displayed in the junction name space of the junction guide map 5. A branch road shape map on an appropriate scale is displayed in a junction display map 9, and the name of the destination of each branch road and the distance to the destination are displayed at the side of each branch road.

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# Patent Abstracts of Japan

PUBLICATION NUMBER : 08145701  
PUBLICATION DATE : 07-06-96

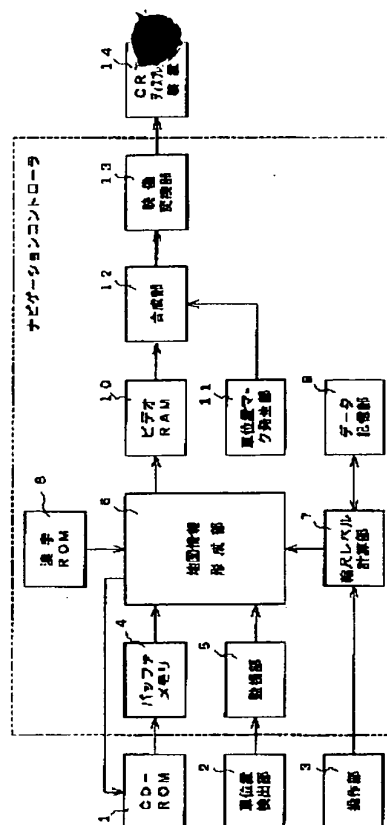
APPLICATION DATE : 22-11-94  
APPLICATION NUMBER : 06288032

APPLICANT : ALPINE ELECTRON INC;

INVENTOR : SEWAKI KOUJI;

INT.CL : G01C 21/00 G08G 1/0969 G09B 29/00  
G09B 29/10

TITLE : ON-VEHICLE NAVIGATION SYSTEM



ABSTRACT : PURPOSE: To improve usability at the time of scroll retrieval by reducing the scale of the character data of a map image displayed on a larger scale than the scale of a small scale map image to use the character data on the small scale map image in the case of displaying a large range of map image on a display part.

CONSTITUTION: When a scroll range is set by an operating part 3, a map information forming part 6 reads a small scale map image over a wide range from a CD-ROM 1 and supplies it to a buffer memory 4 so as to rewrite storage contents. The map information forming part 6 then takes out a required map image in the small scale map image stored in the buffer memory 4 and superposes character data and the like, read from a Chinese character ROM 8 and a data storage part 9, on the small scale map information of one display screen part, on a larger scale than the scale of the small scale map image while reducing the scale of characters themselves so as to form a map image with small scale characters and symbols of one display screen part. The formed map image is displayed (14) through a video RAM 10, a composing part 12 and an image converting part 13.

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## Patent Abstracts of Japan

PUBLICATION NUMBER : 07270172  
PUBLICATION DATE : 20-10-95

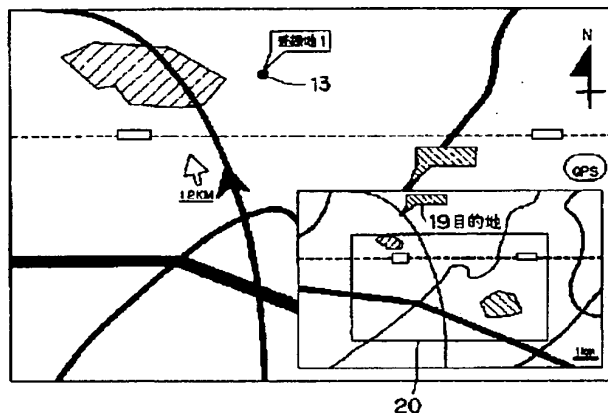
APPLICATION DATE : 01-04-94  
APPLICATION NUMBER : 06065330

APPLICANT : SUMITOMO ELECTRIC IND LTD;

INVENTOR : MURASE TORU;

INT.CL : G01C 21/00 G08G 1/0969 G09B 29/10  
G09G 5/14

TITLE : MAP INDICATION DEVICE IN  
NAVIGATION APPARATUS



ABSTRACT : PURPOSE: To allow a user to catch at a glance where a map indicated on a main window is in a wide area map.

CONSTITUTION: In a navigation apparatus 4 wherein a map stored in a map memory is indicated independently or together with a present position of a vehicle, a reduction map including an area indicated on a main window of an indication screen is concurrently indicated on a sub-window thereof and a frame 20 designating the area corresponding to the map in the main window is indicated in the reduction map on the sub-window.

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## PCT

## INTERNATIONAL SEARCH REPORT

PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file referred to in the International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
60314-115	<b>FOR FURTHER ACTION</b>
International application No.	International filing date (day/month/year)
PCT/US 99/ 24598	21/10/1999
Applicant	(Earliest) Priority Date (day/month/year)
MAGELLAN DIS, INC.	22/10/1998

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

## 4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

## 5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

## 6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

5  
☐ None of the figures.

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7    G01C21/26    G08G1/0969		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7    G01C    G09B    G08G		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 10, 31 October 1996 (1996-10-31) & JP 08 145708 A (SUMITOMO ELECTRIC IND LTD), 7 June 1996 (1996-06-07) abstract	1-29
A	US 4 914 605 A (LOUGHMILLER JR GEORGE E ET AL) 3 April 1990 (1990-04-03) the whole document	1-29
A	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 10, 31 October 1996 (1996-10-31) & JP 08 145701 A (ALPINE ELECTRON INC), 7 June 1996 (1996-06-07) abstract	1-29
-/-		
<div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.         </div> <div> <input checked="" type="checkbox"/> Patent family members are listed in annex.         </div> </div>		
* Special categories of cited documents :		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Z" document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search		Date of mailing of the international search report
2 March 2000		09/03/2000
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016		Authorized officer  Crechet, P



C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 398 188 A (MARUYAMA KOJI) 14 March 1995 (1995-03-14) column 3, line 28 - line 68 column 4, line 21 - line 27 column 4, line 40 - line 60	1-29
A	EP 0 838 662 A (XANAVI INFORMATICS CORP) 29 April 1998 (1998-04-29) column 2, line 38 - line 56	1-29
A	US 5 285 391 A (SMITH JR BERNARD C ET AL) 8 February 1994 (1994-02-08) column 6, line 29 - column 7, line 19	1-29
A	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 02, 29 February 1996 (1996-02-29) & JP 07 270172 A (SUMITOMO ELECTRIC IND LTD), 20 October 1995 (1995-10-20) abstract	1
A	EP 0 306 088 A (PHILIPS NV) 8 March 1989 (1989-03-08) the whole document	1-29

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 08145708	A	07-06-1996	NONE	
US 4914605	A	03-04-1990	AT 146890 T	15-01-1997
			AU 5064485 A	15-05-1986
			CA 1248630 A	10-01-1989
			DE 3588138 D	06-02-1997
			DE 3588138 T	17-04-1997
			EP 0199780 A	05-11-1986
			ES 548848 A	16-05-1989
			IE 76913 B	05-11-1997
			JP 11325924 A	26-11-1999
			JP 10143067 A	29-05-1998
			JP 10149094 A	02-06-1998
			JP 10143068 A	29-05-1998
			JP 2883322 B	19-04-1999
			JP 10260629 A	29-09-1998
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			JP 62501650 T	02-07-1987
			MX 171145 B	04-10-1993
			PT 81349 A,B	01-11-1985
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			ZA 8508112 A	24-06-1987
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US 5398188	A	14-03-1995	JP 2611592 B	21-05-1997
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US 5285391	A	08-02-1994	WO 9303452 A	18-02-1993
JP 07270172	A	20-10-1995	NONE	
EP 0306088	A	08-03-1989	NL 8702087 A	03-04-1989
			JP 1094482 A	13-04-1989
			JP 2801215 B	21-09-1998
			US 4996645 A	26-02-1991



**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/176,630	10/22/98	MILLINGTON	J 60.314-054

PM82/0629

RANDALL L SHOEMAKER  
HOWARD AND HOWARD  
SUITE 101  
1400 NORTH WOODWARD AVENUE  
BLOOMFIELD HILLS MI 48304-2856

EXAMINER

LOBO, I

ART UNIT

PAPER NUMBER

3662

DATE MAILED: 06/29/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

U.  
P1

# Office Action Summary

Application No.  
**09/176,630**

Applicant(s)  
**Millington**

Examiner  
**Ian J. Lobo**

Group Art Unit  
**3662**



☐ Responsive to communication(s) filed on \_\_\_\_\_

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-29 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-29 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2 and 5

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 3662

## **DETAILED ACTION**

### ***Drawings***

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required if the application is allowed.

### ***Claim Rejections - 35 USC § 112***

2. Claims 1-15, 18 and 24-29 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The instant specification does not describe how the "threshold scale" is determined and the criteria used to ascertain it.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 3662

4. Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashida et al ('502) when taken in view of Poonsaengsathit et al ('357) or Loughmiller, Jr. et al ('605) .

Hayashida et al discloses a vehicle location display of a navigation system. The system includes a database 38c and display 33 which includes a map at variable scales, i.e, the first, second and third screens are at different scales.

The difference between the instant independent claims and the Hayashida et al patent is the claims specify that the database contains a plurality of road segments having an associated road segment name.


Loughmiller, Jr. et al and Poonsaengsathit et al each teaches that a typical vehicle navigation system display has a digitized map database which includes plural road segments each having a road segment name. Further, note that Loughmiller, Jr. et al teaches that the street prioritization is scale dependent.

In view of Loughmiller, Jr. et al or Poonsaengsathit et al, it would have been obvious to one of ordinary skill in this art to have modified the map database within the system of Hayashida et al by including road segment names to the road segments so as to more clearly detail the location and destination of a vehicle. Claims 1, 16, 24 and 27 are so rejected.

Dependent claims 2-15, 17-23, 25, 26, 28 and 29 are further provided by the combination of the above prior art.

Art Unit: 3662

5. The status of the co-pending applications, noted on pages 2 and 10 of the instant specification, should be updated .
6. Any inquiry concerning this communication should be directed to Ian J. Lobo at telephone number (703) 306-4161.

  
**IAN J. LOBO**  
**PRIMARY EXAMINER**

<b>Notice of References Cited</b>				Application No. <b>09/176,630</b>		Applicant <b>Millington</b>	
				Examiner <b>Ian J. Lobo</b>		Group Art Unit <b>3662</b>	
						Page 1 of 1	

U.S. PATENT DOCUMENTS						
		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
	A	6,067,502	5/2000	Hayashida Et Al	701	212
	B	5,974,357	10/1999	Poonsaengsathit Et Al	701	210
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS						
		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS	
	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)
U	
V	
W	
X	



FORM PTO-449

U.S. Department of Commerce

(Rev. 2-83)

Patent and Trademark Office

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

(Use several sheets if necessary)

ATTY. DOCKET No.

60,314-054

SERIAL NO.

09/176,630

APPLICANT  
MillingtonFILING DATE  
October 22, 1998GROUP  
~~3661~~

3662

## U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date
ISL	4 9 1 4 6 0 5	04/03/90	Loughmiller, Jr. et al.			
ISL	5 2 8 5 3 9 1	02/08/94	Smith, Jr. et al.			
ISL	5 3 9 8 1 8 8	03/14/95	Maruyama			

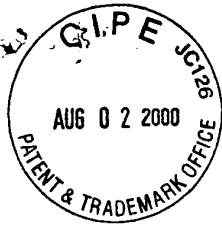
## FOREIGN PATENT DOCUMENTS

		Document Number							Date	Country	Class	Subclass	Translation	
													Yes	No
ISL		0	3	0	6	0	8	8	3/1989	Europe				
ISL	EP	0	8	3	8	6	6	2	4/1991/1998	Europe				
ISL	0	8	1	4	5	7	0	8	6/1996	Japan			Abst	
ISL	0	8	1	4	5	7	0	1	6/1996	Japan			Abst	
ISL	0	7	2	7	0	1	7	2	10/1995,	Japan			Abst	

## OTHER DOCUMENTS (Including Author, Title, Date\*\*, Relevant Pages, Place of Publication\*\*\*)

EXAMINER	IAN J. LOBO	DATE CONSIDERED	6/26/00
EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			





**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Millington  
Serial No.: 09/176,630  
Group Art Unit: 3662  
Filed: October 22, 1998  
Examiner: I. Lobo  
For: STREET IDENTIFICATION FOR A MAP ZOOM  
OF A NAVIGATION SYSTEM

TC 3600 MAIL ROOM

AUG - 7 2000

RECEIVED

**AMENDMENT**

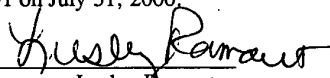
Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Applicant responds to the first Office Action from the Examiner mailed June 29,  
2000, as follows:

**CERTIFICATE OF MAIL**

I hereby certify that the enclosed **Amendment and Change of Address** are being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Assistant Commissioner of Patents, Washington D.C. 20231 on July 31, 2000.

  
Lesley Ramaut

08/09/2000 MHQ LMS 00000003 501482 09176630  
01 FC:103 36.00 CH

**IN THE CLAIMS:**

Please amend claim 16 as follows:

In claim 16, line 8, after "said first map" please insert --simultaneously--.

Please insert the following new claims:

1630. (NEW) The vehicle location display of a navigation system as recited in claim 1 wherein the display does not display the associated road segment name adjacent the current road segment when the variable scale is above a threshold scale.

1731. (NEW) The vehicle location display of a navigation system of claim 30 wherein the display does not display the associated road name of the current road segment in the current location field when the variable scale is below said threshold scale.

RECEIVED  
AUG 7 2000  
16 TC  
MAIL ROOM

**REMARKS**

The Examiner has rejected claims 1-15, 18 and 24-29 under §112 first paragraph for failing to enable one skilled in the art to make and use the invention regarding determining the "threshold scale." Applicant respectfully disagrees. The threshold scale is not a rigidly defined value, but would depend upon many factors, such as size of the display screen, the font size selected by the designer, expected distance of the viewer from the display screen, etc. The specification describes the purpose of the threshold scale (and the purpose of the invention), from which one skilled in the art could select the threshold scale for a particular navigation system. The specification describes that when the map is displayed at a first scale below a threshold scale, the names of the roads can be displayed adjacent the roads on the display. This is shown in Figure 2 of the application.

28  
2

A

However, as can be appreciated, when the scale is increased, such as is shown in Figure 3, the road names can no longer be displayed adjacent each of the roads on the display. The font would have to be reduced to a level which would not be readable by the viewer.

Again, this would depend upon the size of the display screen and the font size chosen by the designer. However, one skilled in the art would be able to utilize these factors in choosing a threshold scale which would insure that the road names are only displayed adjacent the roads when the map is below a threshold scale. Thus, the claims are properly enabled.

The Examiner has rejected claims 1 to 29 as obvious over Hayashida (U.S. Patent No. 6,067,502) in view of Poonsaengsathit (U.S. Patent No. 5,974,357) or Loughmiller (U.S. Patent No. 4,914,605).

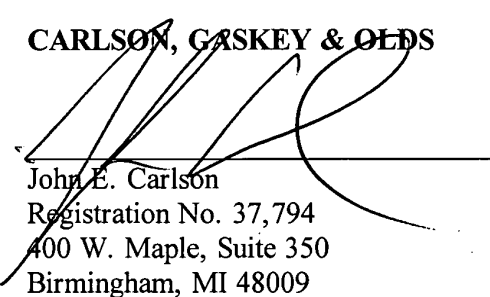
None of the references disclose displaying the road segment name adjacent the current road segment when the scale is below a threshold scale and in a current location field on the display not adjacent the current road segment when the scale is above the threshold scale. Loughmiller is the only reference that changes the display of road segment names based upon scale. However, Loughmiller simply determines whether or not to display the road segment name adjacent the road segment based upon the scale. Loughmiller does not then display the current road segment name in the current location field. Therefore, all of the claims are properly allowable.

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AUG - 7 2009  
TC 3610 MAIL ROOM

The Examiner has rejected claims 16. Applicant has amended claim 16 to clarify the second map and first map are displayed simultaneously. None of the cited references discloses as buying second map and first map with different scales simultaneously. Therefore, claim 16 is properly allowable.

Respectfully submitted,

**CARLSON, GASKEY & OLDS**



John E. Carlson  
Registration No. 37,794  
400 W. Maple, Suite 350  
Birmingham, MI 48009  
(248) 988-8360

Date: July 31, 2000  
Docket No. 60,314-054



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Millington  
Serial No.: 09/176,630  
Group Art Unit: 3662  
Filed: October 22, 1998  
Examiner: I. Lobo  
For: STREET IDENTIFICATION FOR A MAP ZOOM  
OF A NAVIGATION SYSTEM

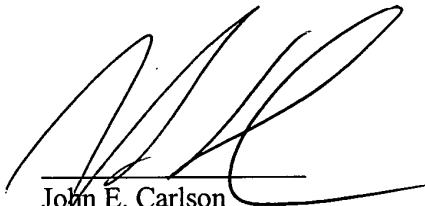
*Change  
of address  
8/8/00  
H/Lob*

Commissioner of Patents & Trademarks  
Washington, D.C. 20231

**CHANGE OF CORRESPONDENCE ADDRESS**

The undersigned is an attorney of record in this file and requests that the correspondence address be changed to:

**CARLSON, GASKEY & OLDS  
400 W. Maple Road, Ste. 350  
Birmingham, Michigan 48009  
(248) 988-8360**

  
\_\_\_\_\_  
John E. Carlson  
Reg. No. 37,794  
Attorney of Record



**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

*YW*

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/176,630    10/22/98    MILLINGTON    J    60.314-054

CARLSON, GASKEY & OLDS  
400 W. MAPLE ROAD, STE 350  
BIRMINGHAM, MI 48009

PM82/0824

EXAMINER

LOBO, I

ART UNIT

PAPER NUMBER

3662

*9/10*

DATE MAILED:

08/24/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**





UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

SK  
#10

**NOTICE OF ALLOWANCE AND ISSUE FEE DUE**

PM82/0824

CARLSON, GASKEY & OLDS  
400 W. MAPLE ROAD, STE 350  
BIRMINGHAM, MI 48009

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/176,630	10/22/98	031	LOBO, I 3662	08/24/00
First Named Applicant	MILLINGTON,	35 USC 154(b) term ext. = 0 Days.		

TITLE OF INVENTION STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2 60.314-054	701-212.000	R14	UTILITY	NO	\$1210.00	11/24/00

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.**

**THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.**

**HOW TO RESPOND TO THIS NOTICE:**

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

A. Pay FEE DUE shown above, or

B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

PATENT AND TRADEMARK OFFICE COPY

# Notice of Allowability

Application No.  
09/176,630

Applicant(s)  
Millington

Examiner  
Ian J. Lobo

Group Art Unit  
3662



All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

☒ This communication is responsive to the amendment filed August 2, 2000.

☒ The allowed claim(s) is/are 1-31.

☐ The drawings filed on \_\_\_\_\_ are acceptable.

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE **THREE MONTHS** FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

☒ Applicant MUST submit NEW FORMAL DRAWINGS

☒ because the originally filed drawings were declared by applicant to be informal.

☐ including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. \_\_\_\_\_.

☐ including changes required by the proposed drawing correction filed on \_\_\_\_\_, which has been approved by the examiner.

☐ including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

☐ Interview Summary, PTO-413

☐ Examiner's Amendment/Comment

☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

☐ Examiner's Statement of Reasons for Allowance

IAN J. LOBO  
PRIMARY EXAMINER  
ART UNIT 3662



B

Docket Number: 60314-054

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#11  
12-8-00  
RMD

In re application of: Millington, Jeffrey

Serial No.: 09/176630

Group Art Unit:

Filed: 10/22/1998

Examiner:

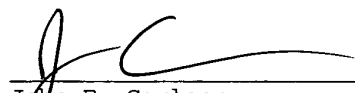
For: STREET IDENTIFICATION FOR MAP ZOOM OF A  
NAVIGATION SYSTEM

Commissioner of Patents & Trademarks  
Washington, D.C. 20231

CHANGE OF CORRESPONDENCE ADDRESS

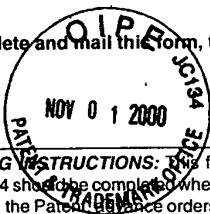
The undersigned is an attorney of record in this file and requests that the correspondence address be changed to:

CARLSON, GASKEY & OLDS  
400 W. Maple Road, Ste. 350  
Birmingham, Michigan 48009  
(248) 988-8360

  
John E. Carlson  
Reg. No. 37,794  
Attorney of Record

## PART B—ISSUE FEE TRANSMITTAL

Complete and mail this form, together with applicable fees, to:

Box ISSUE FEE  
Assistant Commissioner for Patent  
Washington, D.C. 20231BFSK  
JH

**MAILING INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE. Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, the Patent Office orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

CARLSON, GASKEY & OLDS  
400 W. MAPLE ROAD, STE 350  
BIRMINGHAM, MI 48009

PM82/0824

Note: The certificate of mailing below can only be used for domestic mailings of the Issue Fee Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

## Certificate of Mailing

I hereby certify that this Issue Fee Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above on the date indicated below.

Lesley Ramaut

(Depositor's name)

(Signature)

10-30-00

(Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/176,630	10/22/98	031	LOBO, I	3662 08/24/00
First Named Applicant	MILLINGTON,	35 USC 154(b) term ext. =	0 Days.	

TITLE OF INVENTION STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2	60.314-054	701-212.000	R14	UTILITY	NO	\$1240.00 11/24/00

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47) attached.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

Carlson, Gaskey &amp; Olds

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)  
**PLEASE NOTE:** Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Magellan, DIS, Inc.

(B) RESIDENCE (CITY &amp; STATE OR COUNTRY)

Rochester Hills, MI

Please check the appropriate assignee category indicated below (will not be printed on the patent)

☐ individual ☒ corporation or other private group entity ☐ government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):

☒ Issue Fee 10  
☒ Advance Order - # of Copies 10

4b. The following fees or deficiency in these fees should be charged to:

DEPOSIT ACCOUNT NUMBER 50-1482  
(ENCLOSE AN EXTRA COPY OF THIS FORM)

☒ Issue Fee  
☒ Advance Order - # of Copies 10

The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the Issue Fee to the application identified above.

(Authorized Signature)

(Date)

10/30/00

NOTE: The Issue Fee will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the Patent and Trademark Office.

**Burden Hour Statement:** This form is estimated to take 0.2 hours to complete. Time will vary depending on the needs of the individual case. Any comments on the amount of time required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND FEES AND THIS FORM TO: Box Issue Fee, Assistant Commissioner for Patents, Washington D.C. 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

11/02/2000 AZERGAW2 00000052 09176630

01 FC:142

1240.00 DP

02 FC:561

30.00 GP

TRANSMIT THIS FORM WITH FEE



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

#1204

Applicant: Millington  
Serial Number: 09/176,630  
Filed: October 22, 1998  
Group Art Unit: 3662  
Examiner: I. Lobo  
Title: "STREET IDENTIFICATION FOR A MAP ZOOM OF A  
NAVIGATION SYSTEM"  
Attorney Docket Number: 60,314-054

**LETTER TO THE OFFICIAL DRAFTSMAN**


Dear Sir:

This is in response to the Request for Formal Drawings mailed with the Notice of Allowability on August 24, 2000. Applicant submits herewith 5 sheets of formal drawings.

**Respectfully Submitted,**

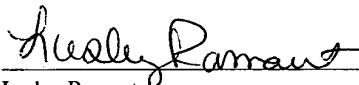
**CARLSON, GASKEY & OLDS, P.C.**

October 30, 2000  
Date

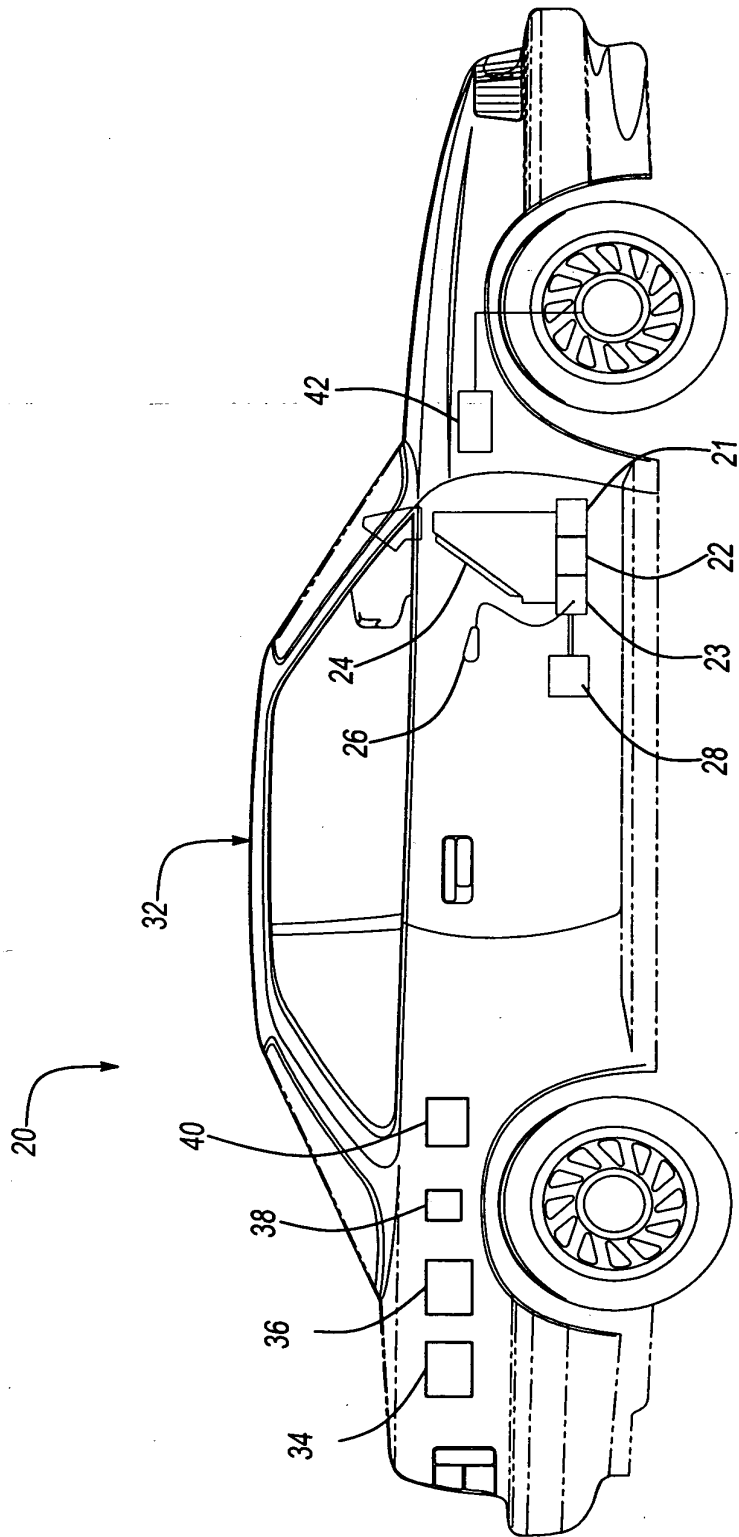
  
John E. Carlson  
Registration No. 37,794  
400 West Maple, Suite 350  
Birmingham, MI 48009  
(248) 988-8360

**CERTIFICATE OF MAILING**

I hereby certify that this Letter To The Official Draftsman is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to the Assistant Commissioner of Patents, Washington, D.C. 20231, on October 30, 2000.

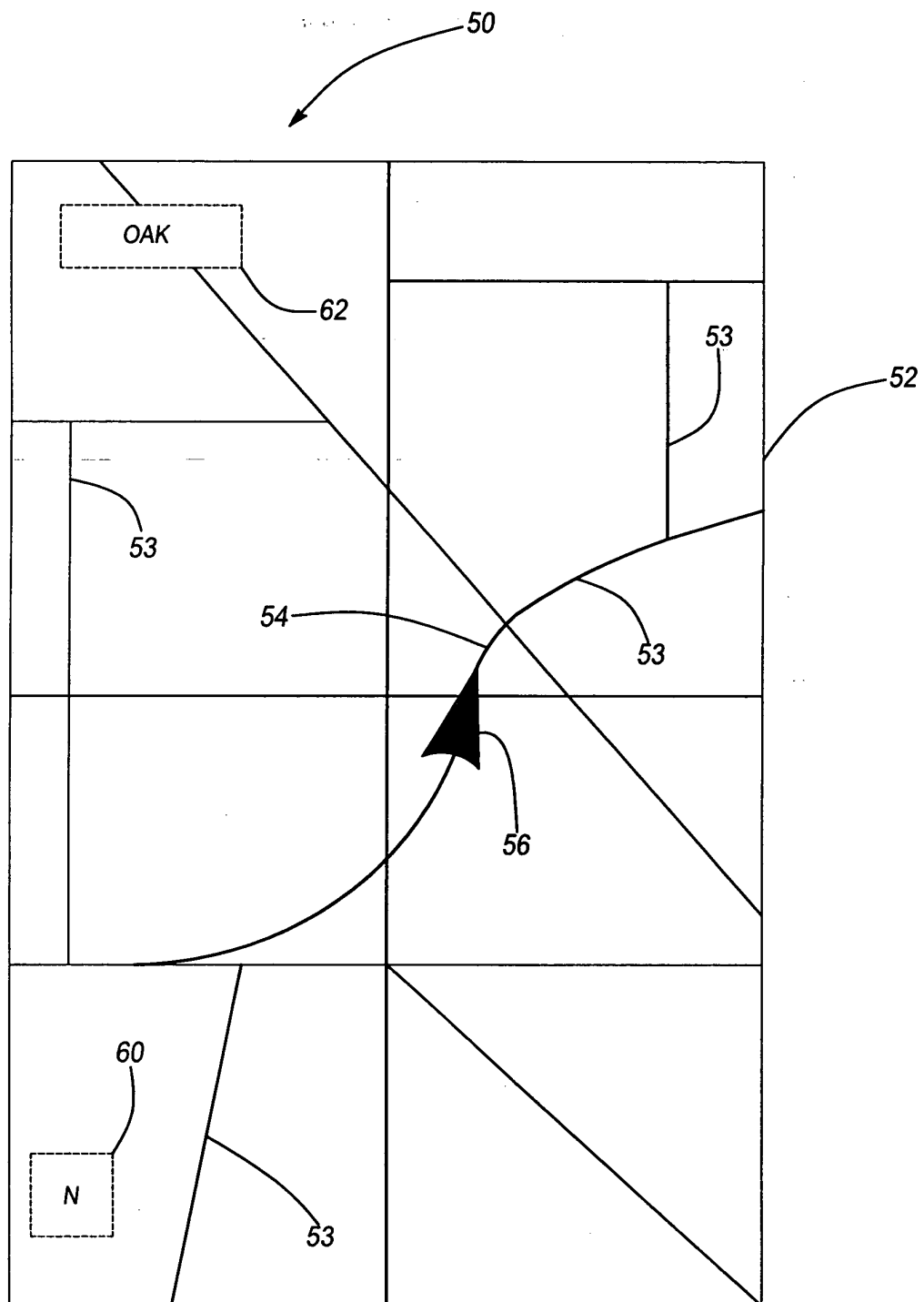
  
Lesley Ramaut

6178380



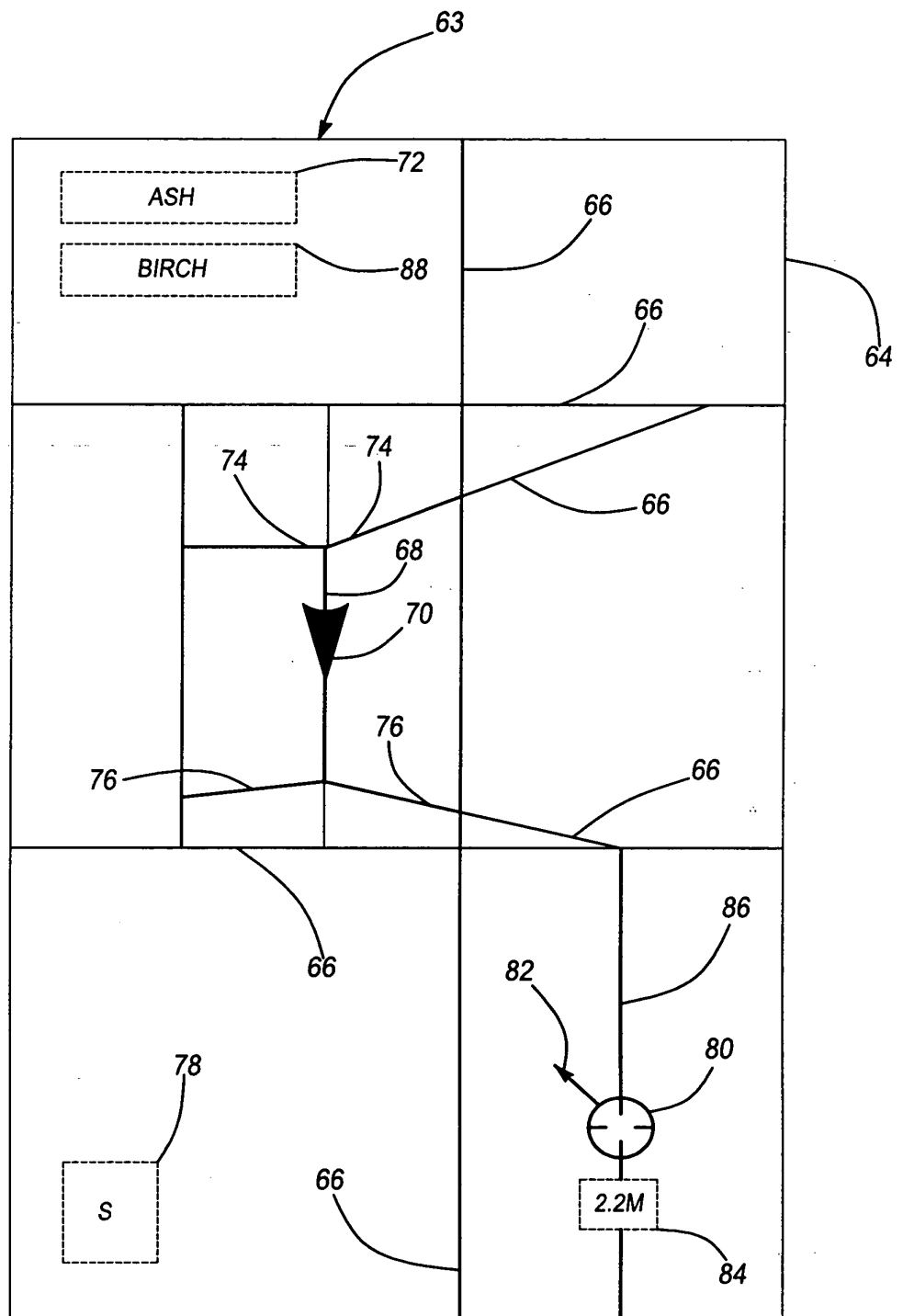
**Fig-1**

EX1002 / Page 155 of 251

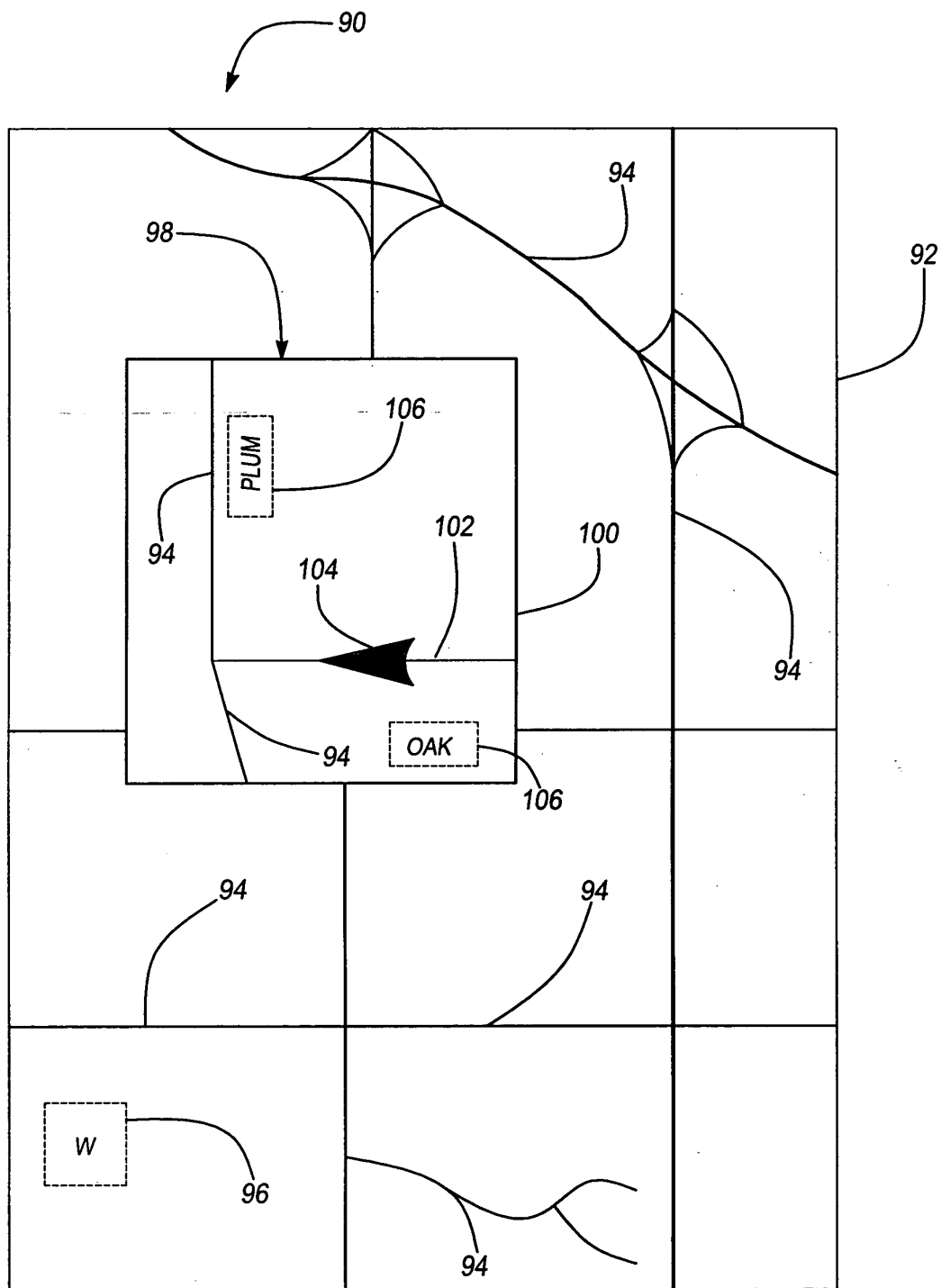


**Fig-3**





**Fig-4**



**Fig-5**



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
ASSISTANT SECRETARY AND COMMISSIONER  
OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

## CHANGE OF ADDRESS/POWER OF ATTORNEY

FILE LOCATION 9200 SERIAL NUMBER 09176630 PATENT NUMBER 6178380

THE CORRESPONDENCE ADDRESS HAS BEEN CHANGED TO CUSTOMER # 26096

THE PRACTITIONERS OF RECORD HAVE BEEN CHANGED TO CUSTOMER # 26096

THE FEE ADDRESS HAS BEEN CHANGED TO CUSTOMER # 26096

ON 09/19/02 THE ADDRESS OF RECORD FOR CUSTOMER NUMBER 26096 IS:

CARLSON, GASKEY & OLDS, P.C.  
400 WEST MAPLE ROAD  
SUITE 350  
BIRMINGHAM MI 48009

AND THE PRACTITIONERS OF RECORD FOR CUSTOMER NUMBER 26096 ARE:

33080 36372 37139 37794 42777 44130 45864 46174 46350 47209

PTO INSTRUCTIONS: PLEASE TAKE THE FOLLOWING ACTION WHEN THE CORRESPONDENCE ADDRESS HAS BEEN CHANGED TO CUSTOMER NUMBER: RECORD, ON THE NEXT AVAILABLE CONTENTS LINE OF THE FILE JACKET, 'ADDRESS CHANGE TO CUSTOMER NUMBER'. LINE THROUGH THE OLD ADDRESS ON THE FILE JACKET LABEL AND ENTER ONLY THE 'CUSTOMER NUMBER' AS THE NEW ADDRESS. FILE THIS LETTER IN THE FILE JACKET. WHEN ABOVE CHANGES ARE ONLY TO FEE ADDRESS AND/OR PRACTITIONERS OF RECORD, FILE LETTER IN THE FILE JACKET. THIS FILE IS ASSIGNED TO GAU 3662.

**PATENT**

**POWER OF ATTORNEY BY ASSIGNEE OF ENTIRE INTEREST**

**Revocation of Power of Attorney with New Power of Attorney**

MITAC INTERNATIONAL CORP., as assignee of record of the entire right, title and interest in each of the patent application(s) or patent(s) listed in the table of Attachment A, hereby revoke all powers of attorney previously given in each of the listed patent application(s) or patent(s) and appoint all practitioners associated with the Customer Number:

27765

as the attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all of the listed patent application(s) and patent(s).

Please recognize or change the correspondence address for the above-identified application to the address associated with the above-mentioned Customer Number.


**Statement under 37 CFR 3.73(b)**

I hereby state that, as required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11. The chain of title is indicated in the table of Attachment A.

Pursuant to 37 CFR 3.71, I hereby state the prosecution of the listed application(s) or reexamination of the listed patent(s) is to be conducted to the exclusion of both the inventor(s) and previous assignee(s).

The undersigned is authorized to act on behalf of the assignee.

Signature



Date

MAR 02 2009

Name

James C. Yuan

Title

Vice President/General Counsel

**Attachment A**

Appl. No.	Filing Date	Title	Chain of Title			
			No.	from	to	Reel/Frame No.
08/713,625	1996/09/13	Navigation system with vehicle service information	1	DEGRAAF, BRENT L.	ROCKWELL INTERNATIONAL CORPORATION	008228/0477
			2	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	009019/0012
			3	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	009259/0527
			4	ROCKWELL LIGHT VEHICLE SYSTEMS INC., (NOW MERITOR LIGHT VEHICLE SYSTEMS, LLC)	MAGELLAN DIS, INC.	009283/0179
			5	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			6	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			7	SILICON VALLEY BANK	MAGELLAN DIS, INC	016570/0683

			8	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			9	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			10	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
08/580,150 1995/12/28	Vehicle navigation system and method		1	CROYLE, STEVEN R. SPENCER, LARRY II SITTARO, ERNIE	ROCKWELL INTERNATIONAL CORP.	008079/0767
			2	ROCKWELL INTERNATIONAL CORPORATION, A DELAWARE CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	011049/0587
			3	ROCKWELL COLLINS, INC.	MAGELLAN DIS, INC.	008944/0810
			4	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	ROCKWELL COLLINS, INC.	009019/0032
			5	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	009019/0012
			6	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642

			7	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			8	SILICON VALLEY BANK	MAGELLAN DIS, INC.	016570/0683
			9	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
			10	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
			11	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
08/713,627	1996/09/13	Navigation system with user definable cost values	1	DEGRAAF, BRENT L.	ROCKWELL INTERNATIONAL CORPORATION	008228/0154
			2	ROCKWELL INTERNATIONAL CORPORATION, A DELAWARE CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	011049/0587
			3	ROCKWELL COLLINS, INC.	MAGELLAN DIS, INC.	008944/0810
			4	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	ROCKWELL COLLINS, INC.	009019/0032
			5	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	009019/0012

			6	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			7	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			8	SILICON VALLEY BANK	MAGELLAN DIS, INC.	016570/0683
			9	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
			10	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
			11	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
08/710,473	1996/09/18	Navigation simulator and recorder	1	ANDERSON, ERIC G.	ROCKWELL INTERNATIONAL CORPORATION	008176/0607
			2	ROCKWELL INTERNATIONAL CORPORATION, A DELAWARE CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	011049/0587
			3	ROCKWELL COLLINS, INC.	MAGELLAN DIS, INC.	008944/0810
			4	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	ROCKWELL COLLINS, INC.	009019/0032



			5	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	009019/0012
			6	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			7	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			8	SILICON VALLEY BANK	MAGELLAN DIS, INC.	016570/0683
			9	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
			10	MAGELLAN NAVIGATION, INC.	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	018194/0375
			11	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
			12	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
08/579,903	1995/12/28	Zero motion detection system for improved vehicle navigation system	1	SPENCER, LARRY, II CROYLE, STEVEN R.	ROCKWELL INTERNATIONAL CORP.	007816/0301

			2	ROCKWELL INTERNATIONAL CORPORATION, A DELAWARE CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	011049/0587
			3	ROCKWELL COLLINS, INC.	MAGELLAN DIS, INC.	008944/0810
			4	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	ROCKWELL COLLINS, INC.	009019/0032
			5	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	009019/0012
			6	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			7	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			8	SILICON VALLEY BANK	MAGELLAN DIS, INC.	016570/0683
			9	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
			10	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
			11	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation

08/579,902	1995/12/28	Vehicle navigation system and method using GPS velocities	1	CROYLE, STEVEN R.	ROCKWELL INTERNATIONAL CORP.	008030/0188
			2	ROCKWELL INTERNATIONAL CORPORATION, A DELAWARE CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	011049/0587
			3	ROCKWELL COLLINS, INC.	MAGELLAN DIS, INC.	008944/0810
			4	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	ROCKWELL COLLINS, INC.	009019/0032
			5	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	009019/0012
			6	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			7	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			8	SILICON VALLEY BANK	MAGELLAN DIS, INC.	016570/0683
			9	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
			10	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381

			11	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recording
			1	MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	009083/0289
			2	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			3	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			4	SILICON VALLEY BANK	MAGELLAN DIS, INC	016570/0683
			5	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			6	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			7	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recording
			1	TIMOSHIN, VLADIMIR G. SOLOVIEV, ALEXANDER M.	MAGELLAN CORPORATION	009432/0549
			2	MAGELLAN CORPORATION	THALES NAVIGATION, INC.	019699/0025
			Navigation system character input device			
09/037,772	1998/03/10					
09/056,723	1998/04/07		Microstrip antenna with an edge ground structure			

		3	THALES NAVIGATION, INC.	MAGELLAN NAVIGATION, INC.	019699/0035
		4	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/114,670 1998/07/13	Navigation system vehicle location display	1	LOU, YONGLE MILLINGTON, JEFFREY ALAN SLOMINSKI, ANTHONY ALBERT	MAGELLAN DIS, INC.	009337/0433
		2	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
		3	BELL & HOWELL MAIL AND MESSAGING TECHNOLOGIES COMPANY	HELLER FINANCIAL INC.	012199/0004
		4	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
		5	SILICON VALLEY BANK	MAGELLAN DIS, INC.	016570/0683
		6	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
		7	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784

			8	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	KIRKHART, MICHAEL O. SPENCER, LARRY E. II	MAGELLAN DIS, INC.	009136/0252
			2	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			3	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			4	SILICON VALLEY BANK	MAGELLAN DIS, INC	016570/0683
			5	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			6	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			7	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	KIRKHART, MICHAEL O. SPENCER, LARRY E., II	MAGELLAN DIS, INC.	019773/0898
			Vehicle navigation system with improved powerup performance			
09/060,899	1998/04/15		Vehicle navigation system with improved powerup performance			
09/377,080	1999/08/19		Vehicle navigation system with improved powerup performance			

			2	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			3	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			4	SILICON VALLEY BANK	MAGELLAN DIS, INC	016570/0683
			5	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
			6	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
			7	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/377,586	1999/08/19	Vehicle navigation system with improved powerup performance	1	KIRKHART, MICHAEL O. SPENCER, LARRY E., II	MAGELLAN DIS, INC.	019773/0898
			2	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			3	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			4	SILICON VALLEY BANK	MAGELLAN DIS, INC	016570/0683

			5	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
			6	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
			7	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/118,030	1998/07/17	Navigation system with predetermined indication of next maneuver	1	LONG, DONALD JOE MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	009335/0342
			2	MAGELLAN DIS, INC.	SILICON VALLEY BANK	011097/0642
			3	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			4	SILICON VALLEY BANK	MAGELLAN DIS, INC.	016570/0683
			5	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			6	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784



			7	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	KARUNANIDHI, UPPARAPALLI	MAGELLAN DIS, INC.	009107/0413
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	PIWOWARSKI, JAMES MALINOWSKI, MARK	ROCKWELL INTERNATIONAL CORPORATION	008149/0290
			2	ROCKWELL COLLINS, INC.	MAGELLAN DIS, INC.	008944/0810
			3	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	ROCKWELL COLLINS, INC.	009019/0032
09/056,218	1998/04/07	Navigation system using position network for map matching				
08/691,727	1996/08/02	Method of providing a textual description of a remote vehicle location				

		4	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	009019/0012
		5	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
		6	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
		7	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
		8	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/160,068	1998/09/24	1	MILLINGTON, JEFFREY ALAN SLOMINSKI, ANTHONY ALBERT	MAGELLAN DIS, INC.	009478/0929
		2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
		3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
		4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784

			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	009274/0043
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/100,683	1998/06/19	Navigation system map panning directional indicator	1	MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	009530/0454
09/176,630	1998/10/22	Street identification for a map zoom of a navigation system	2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639

			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY A.	MAGELLAN DIS, INC.	010521/0842
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	KIRKHART, MICHAEL O. SPENCER, LARRY E., II	MAGELLAN DIS, INC.	019773/0898
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			Navigation system with all character support			
09/470,438	1999/12/22					
09/550,695	2000/04/17		Vehicle navigation system with improved powerup performance			

			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781 / 0370
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781 / 0381
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	CROYLE, STEVEN R. SPENCER, LARRY E., II SITTARO, ERNIE R.	MAGELLAN DIS, INC.	009705 / 0899
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690 / 0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690 / 0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690 / 0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/091,430	1998/11/30	Vehicle navigation system and method using multiple axes accelerometer				

09/239,692 1999/01/29	Vehicle navigation system with location-based multi-media annotation	1	MILLINGTON, JEFFREY ALAN SPENCER, II, LARRY E. LONG, DONALD J.	MAGELLAN DIS, INC.	009736/0524
		2	SPENCER, LARRY E. II LONG DONALD J EKLUND RICHARD LAMBIE MICHAEL G MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	010093/0518
		3	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
		4	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
		5	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
		6	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
		1	UPPARAPALLI, KARUNANIDHI	MAGELLAN DIS, INC.	009243/0368
09/096,103 1998/06/11	Navigation system with a route exclusion list system				

			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY A.	MAGELLAN DIS, INC.	010508/0219
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/470,441	1999/12/22	Navigation system with unique audio tones for maneuver notification				

09/661,982 2000/09/18	Points of interest for a navigation system	1	SLOMINSKI, ANTHONY A. MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	011104/0255
		2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
		3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
		4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
		5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
08/937,072 1997/09/24	Quadrifilar antenna	1	BARTA, GARY S. CASLOW, SCOTT A.	MAGELLAN CORPORATION	008817/0618
		2	MAGELLAN CORPORATION	THALES NAVIGATION, INC.	019699/0025
		3	THALES NAVIGATION, INC.	MAGELLAN NAVIGATION, INC.	019699/0035
		4	MAGELLAN NAVIGATION, INC.	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	018194/0375
		5	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	MAGELLAN NAVIGATION, INC.	022137/0736



			6	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	011224/0091
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	010657/0521
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0937
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0846
09/691,531	2000/10/18	Multiple configurations for a vehicle navigation system				
09/519,143	2000/03/06	Navigation system with complex maneuver instruction				

			4	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019699/0960
			5	MAGELLAN NAVIGATION, INC.	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	018194/0375
			6	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019704/0015
			7	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
08/762,012	1996/12/11	Navigation system using forward-looking origin selection for route re-calculation	1	PIWOWARSKI, JIM J.	ROCKWELL INTERNATIONAL CORPORATION	008455/0443
			2	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL COLLINS, INC.	008944/0802
			3	ROCKWELL COLLINS, INC.	MAGELLAN DIS, INC.	008944/0810
			4	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	ROCKWELL COLLINS, INC.	009019/0030
			5	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			6	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370

			7	MAGELLAN NAVIGATION, INC.	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	018194/0375
			8	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
			9	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	SLOMINSKI, ANTHONY ALBERT	MAGELLAN DIS, INC.	010546/0124
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/418,749	1999/10/15	Navigation system with road condition sampling	1	MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	010325/0888

09/487,654 2000/01/19

Navigation system with route indicators

			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	MAGELLAN NAVIGATION, INC.	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	018194/0375
			5	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			6	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/547,004 2000/04/11		Navigation system with zoomed maneuver instruction	1	MILLINGTON, JEFFREY ALAN SLOMINSK, ANTHONY A.	MAGELLAN DRIVER INFORMATION SYSTEMS, INC.	010729/0138
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784

			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	BEGIN, JOHN DAVID CHEOK, KA C.	MAGELLAN DIS, INC.	009480/0752
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	SHIRK, MICHAEL E. PIWOWARSKI, JAMES MALINOWSKI, MARK FINDLING, PATRICK	ROCKWELL INTERNATIONAL CORPORATION	008160/0376
			2	ROCKWELL COLLINS, INC.	MAGELLAN DIS, INC.	008944/0810
			Calibration of multi-axis accelerometer in vehicle navigation system			
09/159,164	1998/09/23					
			System and method for controlling a vehicle emergency response network			
08/691,663	1996/08/02					

			3	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	ROCKWELL COLLINS, INC.	009019/0032
			4	ROCKWELL INTERNATIONAL CORPORATION	ROCKWELL LIGHT VEHICLE SYSTEMS, INC.	009019/0012
			5	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			6	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
			7	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
			8	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recording
09/099,963	1998/06/19	Autoscaling of recommended route	1	MAXWELL, KENNETH G. MILLINGTON, JEFFREY A.	MAGELLAN DIS, INC.	009263/0626
			2	SLOMINSKI, ANTHONY A.	MAGELLAN DIS, INC.	011040/0526
			3	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798

			4	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			5	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			6	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	009126/0447
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY ALAN	MAGELLAN DRIVER INFORMATION SYSTEMS, INC.	012695/0199
09/062,518	1998/04/17	3-dimensional intersection display for vehicle navigation system				
10/092,910	2002/03/07	Navigation system with run-time training instruction				

			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/799,876	2001/03/06	Navigation system with figure of merit determination	1	MILLINGTON, JEFFREY ALAN SPENCER, LARRY E.	MAGELLAN DIS, INC.	013271/0483
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784



			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	LOKSHIN, ANATOLE PORTNOV, SERGEY V. PANOV, YURIY A. KOROTEEV, MIKHAIL V.	THALES NORTH AMERICA, INC.	013432/0469
			2	THALES NORTH AMERICA, INC.	THALES NAVIGATION, INC.	018535/0847
			3	THALES NAVIGATION, INC.	MAGELLAN NAVIGATION, INC.	018535/0863
			4	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY ALAN	MAGELLAN DIS, INC.	019773/0795
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019781/0362
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC	019781/0370
			Displaying data			
			Navigation system character input device			
09/435,381	1999/11/05					
10/208,261	2002/07/31					

			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019781/0381
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY ALAN PALANISAMY, CHANDIRAN PAPROCKI, RHONDA MARIE SLOMINSKI, ANTHONY ALBERT	MAGELLAN DIS, INC.	013270/0367
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
10/236,350	2002/09/06	Vehicle navigation system with off-road navigation				

10/088,017 2002/09/09	Navigation system with user interface	1	MILLINGTON, JEFFREY ALAN MAXWELL, KENNETH GLENN MOUSER, MICHAEL	MAGELLAN DIS, INC.	013466/0838
		2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
		3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
		4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
		5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
10/774,519 2004/02/10	Asynchronous assisted GPS position determination	1	LOKSHIN, ANATOLE VAVRUS, JON	THALES NAVIGATION, INC.	014978/0126
		2	THALES NAVIGATION, INC.	MAGELLAN NAVIGATION, INC.	019699/0040
		3	MAGELLAN NAVIGATION, INC.	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	018194/0375
		4	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	MAGELLAN NAVIGATION, INC.	022137/0736

			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	BRANCH, CHARLES	THALES NAVIGATION, INC.	015350/0595
			2	THALES NAVIGATION, INC.	MAGELLAN NAVIGATION, INC.	019699/0040
			3	MAGELLAN NAVIGATION, INC.	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	018291/0359
			4	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	MAGELLAN NAVIGATION, INC.	022137/0736
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	BEGIN, JOHN D. SPENCER, LARRY	MAGELLAN DIS, INC.	011160/0204
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			Grid mapping utility for a GPS device			
		10/693,996 2003/10/28				
			Vehicle speed sensor for navigation system			
		09/507,955 2000/02/22				

		4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
		5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
		1	GREENIDGE, COLIN D. PEGLER, JAYSON W. CHOI, KWANGHYUN	THALES NAVIGATION, INC.	015004/0649
		2	THALES NAVIGATION, INC.	MAGELLAN NAVIGATION, INC.	019699/0040
		3	MAGELLAN NAVIGATION, INC.	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	018194/0375
		4	WACHOVIA CAPITAL FINANCE CORPORATION (WESTERN)	MAGELLAN NAVIGATION, INC.	022137/0736
		5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
		1	SHONK, CARL W.	MAGELLAN DIS, INC.	010922/0823
		2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
		Mounting apparatus for electronic devices			
10/606,277	2003/06/26				
		Method of triggering the transmission of data from a mobile asset			
09/598,538	2000/06/21				

			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
			1	MILLINGTON, JEFFREY ALLAN PALANISAMY, CHANDIRAN	MAGELLAN DIS, INC.	010658/0140
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019690/0798
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019690/0639
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019690/0784
			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
09/535,733/2000/03/27		Selective rendering of cartographic entities for a navigation system				

			1	LOKSHIN, ANATOLE PORTNOV, SERGEY V. PANOV, YURIY A.	THALES NORTH AMERICA, INC.	014280/0356
10/619,619	2003/07/16	Intelligent modular navigation information capability	2	THALES NORTH AMERICA, INC.	THALES NAVIGATION, INC.	018535/0847
			3	THALES NAVIGATION, INC.	MAGELLAN NAVIGATION, INC.	018535/0863
			4	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recordation
10/812,027	2004/03/30	Portable vehicle navigation system	1	SPENCER, LARRY MOUSER, MIKE MILLINGTON, JEFFREY A. STEVENS, ROGER A.	MAGELLAN DIS, INC.	019667/0858
			2	MAGELLAN DIS, INC.	THALES NAVIGATION SOLUTIONS, INC.	019681/0744
			3	THALES NAVIGATION SOLUTIONS, INC.	THALES NAVIGATION SOLUTIONS, LLC.	019681/0748
			4	THALES NAVIGATION SOLUTIONS, LLC	MAGELLAN NAVIGATION, INC.	019680/0646

			5	MAGELLAN NAVIGATION, INC.	MITAC INTERNATIONAL CORP.	attached and concurrently submitted for recording
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**ASSET PURCHASE AGREEMENT**  
**BY AND BETWEEN**  
**MITAC INTERNATIONAL CORPORATION**  
**AND**  
**MAGELLAN NAVIGATION, INC.**  
**DATED AS OF DECEMBER 14, 2008**

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dkc

Q17

IN WITNESS WHEREOF, intending to be legally bound hereby, the Parties have caused this Asset Purchase Agreement to be signed in their respective names by their duly authorized representatives as of the date first above written.

BUYER:

MITAC INTERNATIONAL CORPORATION

By: [Signature]  
Name: Chi-Fai Cheng  
Title: AUTHORIZED AGENT and ATTORNEY-IN-FACT

SELLER:

MAGELLAN NAVIGATION, INC.

By: [Signature]  
Name: Paul Mercadant  
Title: PRESIDENT & CEO

dec

RM

"Employee Benefit Plan"	Section 4.01
"ERISA"	Section 4.01
"Escrow Account"	Section 3.02
"Escrow Agent"	Section 3.02
"Escrow Agreement"	Section 3.02
"Excess Retained Seller Group Employee Liabilities"	Section 2.03(b)
"Excluded Assets"	Section 2.02
"Excluded Business"	Section 5.07
"Excluded Liabilities"	Section 2.04
"Financial Statements"	Section 4.01
"Indemnified Party"	Section 6.05
"Indemnifying Party"	Section 6.05
"Intellectual Property"	Section 2.01
"Item of Dispute"	Section 3.03
"Lease"	Section 4.01
"Leased Real Property"	Section 4.01
"Losses"	Section 6.02
"Objection Notice"	Section 3.03
"Party" or "Parties"	Preamble
"Purchased Assets"	Section 2.01
"Releasing Party"	Section 6.10
"Retained Seller Group Employee Liabilities"	Section 2.03(b)
"Retained Seller Group Employees"	Section 2.03(b)
"Russia Employees"	Section 5.06(a)
"Seller Indemnities"	Section 6.03
"Seller"	Preamble
"Third-Party Claim"	Section 6.05
"Transferred Employees"	Section 5.06
"Transferred Contracts"	Section 2.01

## ARTICLE II BASIC TRANSACTION

2.01 Purchase and Sale of Assets. On the terms and subject to the conditions set forth in this Agreement, at the Closing, Buyer will purchase from Seller, and Seller will sell, convey, assign, transfer and deliver (or cause to be sold, conveyed, assigned, transferred or delivered) to Buyer, or its subsidiary designee(s), all of the right, title and interest that the Seller Group possesses and has the right to transfer to the assets and properties listed below (collectively, the "Purchased Assets"), but excluding all Excluded Assets:

- (a) the Seller Group's finished goods, work-in-progress inventory and raw material inventory of Products that constitute the Business;
- (b) the Seller Group's tangible assets specifically listed on Schedule 2.01(b);
- (c) the Contracts set forth on Schedule 2.01(c);

(d) the following Proprietary Rights: (i) the patents, patent applications, pending patent registrations and other patent disclosures set forth on Schedule 2.01(d)(i), (ii) the trademark registrations and trademark applications set forth on Schedule 2.01(d)(ii), as well as the goodwill of the business of Seller associated with the foregoing, (iii) all computer software applications that are exclusively related to the current conduct of the Business, and further including any copyright that is embodied exclusively in such software applications, (iv) all copyrights (other than copyright in computer software) exclusively related to the current conduct of the Business, (v) all trade secrets and confidential information primarily related to the current conduct of the Business and not described in, or embodied in any items set forth on, any part of Schedule 2.01, including, without limitation, ideas, formulae, compositions, designs, know-how, manufacturing and production processes and techniques, research and development information, drawings, specifications, designs, plans, proposals, technical data, financial, business and marketing plans, and customer and supplier lists and related information and (vi) all trade names, domain names, web sites, web pages and corporate names used exclusively in the Business (the "Intellectual Property");

(e) the Leases, other than any Lease of real property located at Park Place Moscow, 113 Leninski Prospekt, Moscow, 11798, Russia;

(f) the Seller Group's trade accounts receivable (other than with respect to any receivables due from any other Affiliate of Seller) in respect of the Products;

(g) the Seller Group's open purchase orders in respect of Business customers and, with respect to the Products, Business vendors (such purchase orders, together with the Contracts transferred pursuant to Section 2.01(c) and the Leases, the "Transferred Contracts");

(h) the Seller Group's other current assets (excluding cash and cash equivalents and excluding those categories of assets that are otherwise specifically described in this Section 2.01) used primarily in the conduct of the Business (except to the extent related to Excluded Assets, including any deposit related to the Russia lease referenced in Section 2.01(e)) or primarily related to the other Purchased Assets;

(i) all of the other tangible assets of the Seller Group primarily related to or used primarily in the Business;

(j) all permits and licenses granted by any Governmental Authority that are primarily related to the Business, to the extent transferable;

(k) all books, records, files, data, reports, plans, mailing lists, customer lists, supplier lists, price lists, sales records, vendor data, marketing information and procedures, sales and customer files, advertising and promotional materials, current product material, equipment maintenance records, warranty information, records of plant operations and the source and disposition of materials used and produced in such plants, standard forms of documents, manuals of operations or business procedures and other similar procedures, in each case to the extent relating primarily to the current operation or conduct of the Business; provided that (i) Seller may retain a copy of any of the foregoing for any purpose it deems necessary for its or its Affiliates' ongoing operations or businesses, including for the ability of Seller to accurately

SCHEDULE 2.01(d)  
PROPRIETARY RIGHTS

Patents

US Patent Pub No.	EP Patent Pub No.	DE Patent Pub No.	Additional Patent No.
5,878,368	1018081A1		
5,922,041			
6,049,755	1078222 (FR)	69911399	
6,078,864			
6,108,603	1070229 (FR,GB)	69931622	
6,141,621	1012743 (FR,GB)	69736905	
6,163,269	1080342A1		
6,175,801	1090273A1		
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6,360,167	1144953A2 1906147A2		
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6,363,322	1254349 (FR,GB)	60032177	
6,374,180			
6,385,542	1354179A2		
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6,430,501	1250566 (FR,GB)	60030591	
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6,574,551	1078224 (FR)	69912116	
6,611,753	1074002 (FR)	69928387	
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2.01(d)

- 73 -

6,741,928			
6,748,323	1540281A1		
6,836,725	1543294A1		
6,873,907	1078225 (FR)	69912272	
7,031,836			
7,142,979	1292934 (FR,GB)	60130759	
7,170,518			
7,233,860			
7,295,921	1147374A1		
2002/0152027A1	1386303A1		
2002/0177948A1	1241651 (FR)	60202800	
2007/0162223A1	1806562A2		
2007/0250515A1		102007028361A1	2441609A (GB) 2905810A1 (FR)
2008/0027644A1			
2008/0051995A1			
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2008/0139181A1			
2008/0198162A1			
6,037,942 6,256,029 6,765,554	1056988 (FR)	69916427	
6,052,646 6,055,479 6,059,843 6,282,495	1071926 (FR)	69911393	
D425,499			
6,049,309			
6,384,798			4101459 (JP)
5,862,511	0870173(FR)	69617268	
5,991,692			
6,029,111	0870174(FR,GB)	69636482	

2.01(d)

- 74 -

6,308,134	0870172(FR)	69621950	
6,532,419	1315945a2		
7,075,459	1155286(FR,GB)	60038543	
7,088,574	1491986a2		
7,026,987	1564564(GB)		
5,819,201			

Pending and In-process Patents

Title	Status	Filing Date	App No.
GPS ASSISTED MERGING	In-process		
MICRO GPS	Inventor reconsidering based on prior art		
ACTIVE POIs	On hold		
ADJUSTING SPATIAL OPERATION BASED ON MAP DENSITY	Pending	25-Apr-07	11/740,280
ADVERTISEMENT FEEDBACK	Pending	17-Aug-07	11/840,610
ALGORITHM TO SEARCH FOR LOCAL PARKING	Pending	18-Jan-08	12/016,980
ALTERNATE ENTRANCE RECORDING	Pending	18-Jan-08	12/016,982
APPARATUS AND METHOD OF GENERATING CURVED BASELINE FOR MAP LABELING	Pending	16-Feb-07	11/675,817
ATTACHING A LOCATION TO AN SMS MESSAGE	Pending	27-Dec-07	11/965,356
GPRS TRAFFIC	Pending	26-Nov-07	11/945,211
HEAVEN AND EARTH	Pending	27-Jul-07	11/829,856
INTEGRATION OF BREADCRUMBS AND SEGMENT ROUTING	Pending	18-Jan-08	12/016,949
METHOD AND SYSTEM FOR NAVIGATION USING GPS VELOCITY VECTOR	Pending	18-Apr-07	11/737,125

METHOD AND SYSTEM OF SECURING CONTENT AND DESTINATION OF DIGITAL DOWNLOAD VIA THE INTERNET	Pending	11-Sep-06	11/518,205
METHODS AND APPARATUS FOR DETERMINING A ROUTE HAVING AN ESTIMATED MINIMUM FUEL USAGE FOR A VEHICLE	Pending	9-Mar-07	11/684,301
OFF-BOARD NAVIGATION SYSTEM WITH PERSONALIZED NAVIGATION DATABASE	Pending	12-Mar-02	10/096,365
ONETOUCH	Pending	31-Dec-07	11/967,889
RDS-TMC WAKE-UP	Pending	27-Jul-07	11/881,495
REROUTING OF CAR NAVIGATION DEVICES	Pending	23-Aug-07	11/844,321
SMART CITY SEARCH	Pending	20-Aug-08	
SMART DETOUR	Pending	9-Jan-06	11/327,450
SMART VIA POINTS	Pending	14-Aug-08	12/192,018
SOCIAL NETWORK DRIVEN NAVIGATION CONTENT SHARING	Pending	11-Jan-08	12/013,384
SPIRAL SEARCH	Pending	10-Sep-07	11/852,973
STATIC AND DYNAMIC CONTOURS	Pending	1-Oct-07	11/906,277
TRIP FUNCTION	Pending	7-Aug-08	12/188,139
VEHICLE DOCKING STATION FOR PORTABLE HAND-HELD COMPUTING DEVICE	Pending	3-Apr-02	10/115,876
PORTABLE VEHICLE NAVIGATION SYSTEM	Pending (continuation)	13-Sep-07	11/855,129
TUNING REAL-TIME KINEMATIC METHOD AND APPARATUS	Pending (continuation)	9-Nov-07	11/938,217



## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	4890728
<b>Application Number:</b>	09176630
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2102
<b>Title of Invention:</b>	STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM
<b>First Named Inventor/Applicant Name:</b>	JEFFREY ALAN MILLINGTON
<b>Customer Number:</b>	26096
<b>Filer:</b>	Winston Hsu
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	60.314-054
<b>Receipt Date:</b>	04-MAR-2009
<b>Filing Date:</b>	22-OCT-1998
<b>Time Stamp:</b>	04:33:44
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
------------------------	----

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	579820.PDF	4312487 <small>6930e8f714d6579c33e86f1737348cabb8b a8262</small>	no	45

### Warnings:

### Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	60.314-054

27765  
NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION  
P.O. BOX 506  
MERRIFIELD, VA 22116

**CONFIRMATION NO. 2102**  
**POA ACCEPTANCE LETTER**



Date Mailed: 03/09/2009

## NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/03/2009.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/deelliott/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	60.314-054

26096  
CARLSON, GASKEY & OLDS, P.C.  
400 WEST MAPLE ROAD  
SUITE 350  
BIRMINGHAM, MI 48009

## CONFIRMATION NO. 2102 POWER OF ATTORNEY NOTICE



\*OC000000034895092\*

Date Mailed: 03/09/2009

### NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/03/2009.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/deelliott/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

## POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☒ Practitioners associated with the Customer Number:

27,076

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☒ The address associated with Customer Number:

27,076

OR

<input type="checkbox"/> Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone		Email	

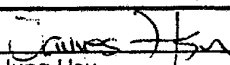
Assignee Name and Address:

Beacon Navigation Inc.  
Offshore Chambers, P.O. Box 217,  
Apia, Samoa

**A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.**

### SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	June 09, 2011
Name	Kuei-Jung Hsu	Telephone	866-2-2894-3708
Title	Chairman of Beacon Navigation		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

**STATEMENT UNDER 37 CFR 3.73(b)**

Applicant/Patent Owner: Jeffrey Alan Millington  
Patent No.: 6,178,380 Issue Date: January 23, 2001  
Entitled: STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM  
Beacon Navigation Inc., a Corporation  
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or  
2. ☐ an assignee of less than the entire right, title and interest.  
(The extent (by percentage) of its ownership interest is \_\_\_\_\_ %)  
in the patent application/patent identified above by virtue of either:  
A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel \_\_\_\_\_ Frame \_\_\_\_\_, or a true copy of the assignment is attached. OR  
B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Jeffrey A. Millington To: Magellan DIS, Inc.  
The document was recorded in the United States Patent and Trademark Office at Reel 009530, Frame 0454, or for which a copy thereof is attached.
2. From: Magellan DIS, Inc. To: Thales Navigation Solutions, Inc.  
The document was recorded in the United States Patent and Trademark Office at Reel 019690, Frame 0798, or for which a copy thereof is attached.
3. From: Thales Navigation Solutions, Inc. To: Thales Navigation Solutions, LLC  
The document was recorded in the United States Patent and Trademark Office at Reel 019690 Frame 0639, or for which a copy thereof is attached.
4. From: Thales Navigation Solutions, LLC To: Magellan Navigation, Inc.  
The document was recorded in the United States Patent and Trademark Office at Reel 019690, Frame 0784, or for which a copy thereof is attached.
5. From: Magellan Navigation, Inc. To: MITAC International Corporation  
The document was recorded in the United States Patent and Trademark Office at Reel 022343, Frame 0987, or for which a copy thereof is attached.
6. From: MITAC International Corporation To: Beacon Navigation Inc.  
The document was recorded in the United States Patent and Trademark Office at Reel 026190 Frame 0458, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]  
The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

[Signature]  
Signature

Kuei-Jung Hsu  
Printed or Typed Name

Chairman of Beacon Navigation  
Title

June 29 2011  
Date  
866-2-2894-3708  
Telephone Number

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	10335270
<b>Application Number:</b>	09176630
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2102
<b>Title of Invention:</b>	STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM
<b>First Named Inventor/Applicant Name:</b>	JEFFREY ALAN MILLINGTON
<b>Customer Number:</b>	27765
<b>Filer:</b>	Jennifer Marie Lane/Eric Eaton
<b>Filer Authorized By:</b>	Jennifer Marie Lane
<b>Attorney Docket Number:</b>	MICP0097USA
<b>Receipt Date:</b>	17-JUN-2011
<b>Filing Date:</b>	22-OCT-1998
<b>Time Stamp:</b>	18:58:26
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		P222580US01_POA.pdf	158446 9726167c5b7170410c46c99331c9f6c9b3194c13	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Power of Attorney	1	1
	Assignee showing of ownership per 37 CFR 3.73(b).	2	2
Warnings:			
Information:			
Total Files Size (in bytes):		158446	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>			





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United States Patent and Trademark Office  
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Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	MICP0097USA

**CONFIRMATION NO. 2102**

**POWER OF ATTORNEY NOTICE**

27765  
NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION  
P.O. BOX 506  
MERRIFIELD, VA 22116



Date Mailed: 06/30/2011

**NOTICE REGARDING CHANGE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 06/17/2011.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/deelliott/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	

27076  
DORSEY & WHITNEY LLP  
INTELLECTUAL PROPERTY DEPARTMENT  
Columbia Center  
701 Fifth Avenue, Suite 6100  
SEATTLE, WA 98104-7043

**CONFIRMATION NO. 2102**  
**POA ACCEPTANCE LETTER**



Date Mailed: 06/30/2011

## NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/17/2011.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/deelliott/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>REEXAMINATION - PATENT OWNER POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS</b>	Control Number(s)	90/012,047
	Filing Date(s)	12-13-2011
	First Named Inventor	JEFFREY ALAN MILLINGTON
	Title	Street Identification for a Map Zoom of a
	Patent Number	6,178,380
	Examiner Name	ALEXANDER J. KOSOWSKI
	Attorney Docket No(s).	B063-0004RE

I hereby revoke all previous patent owner powers of attorney given in the above-identified reexamination proceeding control number(s).

☐ A Power of Attorney is submitted herewith.**OR**☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the proceeding(s) identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

29150

**OR**☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the proceeding(s) identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified reexamination proceeding control number(s) (more than one may be changed **only** if they are merged proceedings) to be:☒ The address associated with the above-mentioned Customer Number.**OR**☐ The address associated with Customer Number:**OR**☐ Firm or Individual Name

Lee &amp; Hayes, PLLC

Address

601 W. Riverside Ave, Suite 1400

City

Spokane

State

WA

Zip

99201

Country

US

Telephone

509-324-9256

Email

lhpto@leehayes.com

I am the:

☐ Inventor, having ownership of the patent being reexamined.**OR**☒ Patent owner.

Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on \_\_\_\_\_.

**SIGNATURE of Inventor or Patent Owner**

Signature

*Tim A. Williams*

Date

30 Mar 12

Name

Tim A. Williams

Telephone

925-984-5148

Title and Company

President and CEO of Beacon Navigation GMBH

**NOTE:** Signatures of all the inventors or patent owners of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below\*.☐ \*Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Copied from 90012047 on 06/15/2012

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**STATEMENT UNDER 37 CFR 3.73(b)**

Applicant/Patent Owner: BEACON NAVIGATION GMBH

Application No./Patent No.: 6178380

Filed/Issue Date: 01/23/2001

Titled:

STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM

BEACON NAVIGATION GMBH

, a

limited liability company

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in  
(The extent (by percentage) of its ownership interest is \_\_\_\_\_ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy therefore is attached.

OR

- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: MILLINGTON, JEFFREY ALAN To: MAGELLAN DIS, INC.

The document was recorded in the United States Patent and Trademark Office at  
Reel 009530, Frame 0454, or for which a copy thereof is attached.

2. From: MAGELLAN DIS, INC. To: THALES NAVIGATION SOLUTIONS, INC.

The document was recorded in the United States Patent and Trademark Office at  
Reel 019690, Frame 0798, or for which a copy thereof is attached.

3. From: THALES NAVIGATION SOLUTIONS, INC. To: THALES NAVIGATION SOLUTIONS, LLC.

The document was recorded in the United States Patent and Trademark Office at  
Reel 019690, Frame 0639, or for which a copy thereof is attached.

☒ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Tim A. Williams

Signature

30 Mar 12

Date

Tim A. Williams

Printed or Typed Name

President and CEO

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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4. From: THALES NAVIGATION SOLUTIONS, LLC.

To: MAGELLAN NAVIGATION, INC.

The document was recorded in the United States Patent and Trademark Office at  
Reel 019690, Frame 0784, or for which a copy thereof is attached.

5. From: MAGELLAN NAVIGATION, INC. To: MITAC INTERNATIONAL CORP.

The document was recorded in the United States Patent and Trademark Office at  
Reel 022343, Frame 0987, or for which a copy thereof is attached.

6. From: MITAC INTERNATIONAL CORP. To: BEACON NAVIGATION INC.

The document was recorded in the United States Patent and Trademark Office at  
Reel 026190, Frame 0458, or for which a copy thereof is attached.

7. From: BEACON NAVIGATION INC. To: BEACON NAVIGATION GMBH.

The document was recorded in the United States Patent and Trademark Office at  
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Bib Data Sheet

CONFIRMATION NO. 2102

<b>SERIAL NUMBER</b> 09/176,630	<b>FILING OR 371(c) DATE</b> 10/22/1998 <b>RULE</b>	<b>CLASS</b> 701	<b>GROUP ART UNIT</b> 3662	<b>ATTORNEY DOCKET NO.</b>
------------------------------------	---	---------------------	-------------------------------	----------------------------

## APPLICANTS

JEFFREY ALAN MILLINGTON, ROCHESTER HILLS, MI;

\*\* CONTINUING DATA \*\*\*\*\*

\*\* FOREIGN APPLICATIONS \*\*\*\*\*

## IF REQUIRED, FOREIGN FILING LICENSE GRANTED \*\*

11/10/1998

Foreign Priority claimed <input type="checkbox"/> yes <input type="checkbox"/> no	<b>STATE OR COUNTRY</b> MI	<b>SHEETS DRAWING</b> 5	<b>TOTAL CLAIMS</b> 29	<b>INDEPENDENT CLAIMS</b> 4
35 USC 119 (a-d) conditions met <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Met after Allowance				
Verified and Acknowledged <u>Examiner's Signature</u> <u>Initials</u>				

## ADDRESS

29150

## TITLE

STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM

<b>FILING FEE RECEIVED</b> 1106	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	<input type="checkbox"/> All Fees
		<input type="checkbox"/> 1.16 Fees ( Filing )
		<input type="checkbox"/> 1.17 Fees ( Processing Ext. of time )
		<input type="checkbox"/> 1.18 Fees ( Issue )
		<input type="checkbox"/> Other _____
		<input type="checkbox"/> Credit



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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	

27076  
DORSEY & WHITNEY LLP  
INTELLECTUAL PROPERTY DEPARTMENT  
Columbia Center  
701 Fifth Avenue, Suite 6100  
SEATTLE, WA 98104-7043

## CONFIRMATION NO. 2102 POWER OF ATTORNEY NOTICE



Date Mailed: 06/18/2012

### NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/06/2012.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/rbell/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101





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Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	

29150  
LEE & HAYES, PLLC  
601 W. RIVERSIDE AVENUE  
SUITE 1400  
SPOKANE, WA 99201

**CONFIRMATION NO. 2102**  
**POA ACCEPTANCE LETTER**



Date Mailed: 06/18/2012

## NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/06/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/rbell/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PATENT - POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS</b>	Patent Number	6,178,380
	Issue Date	January 23, 2001
	First Named Inventor	Millington
	Title	STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM
	Attorney Docket Number	559410-0005-01

I hereby revoke all previous powers of attorney given in the above-identified patent.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: 24187

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified patent to:

☒ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

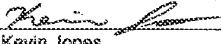
I am the:

☐ Inventor, having ownership of the patent.

OR

☒ Patent owner.  
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on April 6, 2012

**SIGNATURE of Inventor or Patent Owner**

Signature		Date	08/13/14
Name	Kevin Jones	Telephone	650-517-5280
Title and Company	Counsel for Beacon Navigation GmbH		

**NOTE:** Signatures of all the inventors or patent owners of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ \*Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	19860741
<b>Application Number:</b>	09176630
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2102
<b>Title of Invention:</b>	STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM
<b>First Named Inventor/Applicant Name:</b>	JEFFREY ALAN MILLINGTON
<b>Customer Number:</b>	29150
<b>Filer:</b>	Lance Reich/Liz Miller
<b>Filer Authorized By:</b>	Lance Reich
<b>Attorney Docket Number:</b>	
<b>Receipt Date:</b>	13-AUG-2014
<b>Filing Date:</b>	22-OCT-1998
<b>Time Stamp:</b>	19:18:58
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	0005-01_POA_exec.pdf	39965 2b34bb2e94042e846afad76b937279193ab90d43	no	1

### Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

**Information:**

**Total Files Size (in bytes):**

39965

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**



# UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office  
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P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	

29150  
LEE & HAYES, PLLC  
601 W. RIVERSIDE AVENUE  
SUITE 1400  
SPOKANE, WA 99201

## CONFIRMATION NO. 2102 POWER OF ATTORNEY NOTICE



Date Mailed: 09/19/2014

### NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/13/2014.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/deelliott/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



# UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	559410-0005-01

**CONFIRMATION NO. 2102**

**POA ACCEPTANCE LETTER**



24187  
MILLER NASH LLP  
601 UNION STREET  
SUITE 4400  
SEATTLE, WA 98101-2352

Date Mailed: 09/19/2014

## NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/13/2014.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/deelliott/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Doc Code: PET.POA.WDRW

Document Description: Petition to withdraw attorney or agent (SB83)

PTO/AIA/83 (04-13)

Approved for use through 11/30/2014. OMB 0651-0035

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS</b>	Application Number	09/176,630
	Filing Date	October 22, 1998
	First Named Inventor	Jeffrey Alan Millington
	Art Unit	3662
	Examiner Name	Lobo, Ian J.
	Practitioner Docket Number	559410-0005

**To: Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450**

Please withdraw me as attorney or agent for the above-identified patent application, and

- ☐ all the practitioners of record;
- ☐ the practitioners (with registration numbers) of record listed on the attached paper(s); or
- ☒ the practitioners of record associated with Customer Number: 24187

NOTE: The immediately preceding box should only be marked when the practitioners were appointed using the listed Customer Number.

The reason(s) for this request are those described in 37 CFR:

- |   |                                       |                                       |
|---|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> 11.116(a)(1)                       | <input type="checkbox"/> 11.116(a)(2) | <input type="checkbox"/> 11.116(a)(3) |
| <input checked="" type="checkbox"/> 11.116(b)(1)            | <input type="checkbox"/> 11.116(b)(2) | <input type="checkbox"/> 11.116(b)(3) |
| <input type="checkbox"/> 11.116(b)(4)                       | <input type="checkbox"/> 11.116(b)(5) | <input type="checkbox"/> 11.116(b)(6) |
| <input type="checkbox"/> 11.116(b)(7) Please explain below: |                                       |                                       |

#### Certifications

**Check each box below that is factually correct. WARNING: If a box is left unchecked, the request will likely not be approved.**

- ☒ I/We have given reasonable notice to the client, prior to the expiration of the response period, that the practitioner(s) intend to withdraw from employment.
- ☒ I/We have delivered to the client or a duly authorized representative of the client all papers and property (including funds) to which the client is entitled.
- ☒ I/We have notified the client of any responses that may be due and the time frame within which the client must respond.

Please provide an explanation, if necessary:

[Page 1 of 2]

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

## REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS

**Complete the following section only when the correspondence address will change. Changes of address will only be accepted to an applicant.**

Change the correspondence address and direct all future correspondence to:

A. ☐ The address of the applicant associated with Customer Number: \_\_\_\_\_

**OR**

B. ☒ Applicant

Address Beacon Navigation GmbH / P.O. BOX 4029

City <b>Zug</b>	State	Zip <b>6304</b>	Country <b>Switzerland</b>
-----------------	-------	-----------------	----------------------------

Telephone	Email
-----------	-------

I am authorized to sign on behalf of myself and all withdrawing practitioners.

Signature **/Chandra E. Eidt/**

Name <b>Chandra E. Eidt</b>	Registration No. <b>57895</b>
-----------------------------	-------------------------------

Address **Miller Nash Graham & Dunn LLP; Pier 70, 2801 Alaskan Way, Suite 300**

City <b>Seattle</b>	State <b>WA</b>	Zip <b>98121</b>	Country <b>US</b>
---------------------	-----------------	------------------	-------------------

Date <b>10/16/2015</b>	Telephone No. <b>206-624-8300</b>
------------------------	-----------------------------------

**NOTE: Withdrawal is effective when approved rather than when received.**

[Page 2 of 2]

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*



## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	23813281
<b>Application Number:</b>	09176630
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2102
<b>Title of Invention:</b>	STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM
<b>First Named Inventor/Applicant Name:</b>	JEFFREY ALAN MILLINGTON
<b>Customer Number:</b>	24187
<b>Filer:</b>	Chandra E. Eidt/Liz Miller
<b>Filer Authorized By:</b>	Chandra E. Eidt
<b>Attorney Docket Number:</b>	559410-0005-01
<b>Receipt Date:</b>	16-OCT-2015
<b>Filing Date:</b>	22-OCT-1998
<b>Time Stamp:</b>	18:16:56
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition to withdraw attorney or agent (SB83)	BEACON_0005.pdf	302587 e36789263510f6bf34845d94b8b49a2a014a4d1d	no	3

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### Information:

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**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

<b>PATENT - POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS</b>	Patent Number	6,178,380
	Issue Date	January 23, 2001
	First Named Inventor	Jeffrey Alan Millington
	Title	STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM
	Attorney Docket Number	BN.P0006US (559410-0005-01)

I hereby revoke all previous powers of attorney given in the above-identified patent.

☐ A Power of Attorney is submitted herewith.

**OR**

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: 118756

**OR**

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified patent to:

☒ The address associated with the above-mentioned Customer Number.

**OR**

☐ The address associated with Customer Number:

**OR**

<input type="checkbox"/> Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

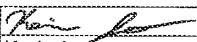
I am the:

☐ Inventor, having ownership of the patent.

**OR**

☒ Patent owner.  
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on April 6, 2012.

**SIGNATURE of inventor or Patent Owner**

Signature		Date	10/15/15
Name	Kevin Jones	Telephone	650-517-5280
Title and Company	Counsel for Beacon Navigation GmbH		

**NOTE:** Signatures of all the inventors or patent owners of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ \*Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	23869520
<b>Application Number:</b>	09176630
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2102
<b>Title of Invention:</b>	STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM
<b>First Named Inventor/Applicant Name:</b>	JEFFREY ALAN MILLINGTON
<b>Customer Number:</b>	24187
<b>Filer:</b>	Lance Reich/Virginia Coggan
<b>Filer Authorized By:</b>	Lance Reich
<b>Attorney Docket Number:</b>	559410-0005-01
<b>Receipt Date:</b>	22-OCT-2015
<b>Filing Date:</b>	22-OCT-1998
<b>Time Stamp:</b>	21:43:33
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
------------------------	----

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	BN-P0006US-POA.pdf	93201 bcb88b3f80a5f35cf1695dcb2675697a3fddw568	no	1

### Warnings:

### Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

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**National Stage of an International Application under 35 U.S.C. 371**

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**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	BN.P0006US

**CONFIRMATION NO. 2102**

**POA ACCEPTANCE LETTER**



118756  
Han Santos Reich, PLLC  
1411 4th Ave, Suite 760  
Seattle, WA 98101-2231

Date Mailed: 10/27/2015

## NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/22/2015.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/dtvernon/



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United States Patent and Trademark Office  
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Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	559410-0005-01

**CONFIRMATION NO. 2102**

## POWER OF ATTORNEY NOTICE

24187  
MILLER NASH GRAHAM & DUNN LLP  
Pier 70, 2801 Alaskan Way, Suite 300  
Seattle, WA 98121



Date Mailed: 10/27/2015

## NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/22/2015.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/dtvernon/



AO 120 (Rev. 08/10)

<b>TO:</b> <b>Mail Stop 8</b> <b>Director of the U.S. Patent and Trademark Office</b> <b>P.O. Box 1450</b> <b>Alexandria, VA 22313-1450</b>	<b>REPORT ON THE</b> <b>FILING OR DETERMINATION OF AN</b> <b>ACTION REGARDING A PATENT OR</b> <b>TRADEMARK</b>
---	---

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been  
filed in the U.S. District Court Eastern District of Michigan on the following  
☐ Trademarks or ☒ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 2:13-cv-11517-VAR	DATE FILED 4/3/2013	U.S. DISTRICT COURT Eastern District of Michigan
PLAINTIFF Beacon Navigation GmbH		DEFENDANT Suzuki Motor Corporation et al
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		see attached
2		
3		
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		see attached
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT STIPULATED ORDER DISMISSING CASE With Prejudice and Without Costs and Attorney Fees
---

CLERK David J. Weaver	(BY) DEPUTY CLERK S. Schoenherr	DATE 9/19/2016
--------------------------	------------------------------------	-------------------

Copy 1—Upon initiation of action, mail this copy to Director    Copy 3—Upon termination of action, mail this copy to Director  
Copy 2—Upon filing document adding patent(s), mail this copy to Director    Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	<p>Mail Stop 8</p> <p>Director of the U.S. Patent and Trademark Office</p> <p>P.O. Box 1450</p> <p>Alexandria, VA 22313-1450</p>	<p><b>REPORT ON THE</b></p> <p><b>FILING OR DETERMINATION OF AN</b></p> <p><b>ACTION REGARDING A PATENT OR</b></p> <p><b>TRADEMARK</b></p>
-----	--	--

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the District of Delaware on the following

☐ Trademarks or ☒ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT for the District of Delaware
PLAINTIFF BEACON NAVIGATION GMBH		DEFENDANT SUZUKI MOTOR CORPORATION AND AMERICAN SUZUKI MOTOR CORPORATION
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 6,374,180 B1	4/16/2002	Beacon Navigation GmbH
2 6,178,380 B1	1/23/2001	Beacon Navigation GmbH
3 6,029,111	2/22/2000	Beacon Navigation GmbH
4 5,862,511	1/19/1999	Beacon Navigation GmbH
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY	
	<input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
-------	-------------------	------

Copy 1—Upon initiation of action, mail this copy to Director      Copy 3—Upon termination of action, mail this copy to Director  
Copy 2—Upon filing document adding patent(s), mail this copy to Director      Copy 4—Case file copy

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	28629107
<b>Application Number:</b>	90013733
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1203
<b>Title of Invention:</b>	STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM
<b>First Named Inventor/Applicant Name:</b>	6178380
<b>Customer Number:</b>	118756
<b>Filer:</b>	Lance Reich/Josi Bridges
<b>Filer Authorized By:</b>	Lance Reich
<b>Attorney Docket Number:</b>	BN.RE0006US
<b>Receipt Date:</b>	15-MAR-2017
<b>Filing Date:</b>	20-APR-2016
<b>Time Stamp:</b>	19:32:54
<b>Application Type:</b>	Reexam (Third Party)

### Payment information:

Submitted with Payment		no			
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BN-RE0006US-US2-Corrected-Response.pdf	9080081	yes	19
			a873a4046a844bab64905ac394e95b2461eb29d1		

Copied from 90013733 on 03/16/2017

Multipart Description/PDF files in .zip description					
Document Description			Start	End	
Response after non-final action-owner timely			1	1	
Claims			2	9	
Response after non-final action-owner timely			10	18	
Reexam Certificate of Service			19	19	
<b>Warnings:</b>					
<b>Information:</b>					
2	Power of Attorney	BN-RE0006US-US2-POA.pdf	120435	no	3
			e7f3da798a302cee83e4c53e10a9492ff2ce4a		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			9200516		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

**REEXAMINATION OR SUPPLEMENTAL  
EXAMINATION – PATENT OWNER POWER OF  
ATTORNEY OR REVOCATION OF POWER OF  
ATTORNEY WITH A NEW POWER OF ATTORNEY  
AND CHANGE OF CORRESPONDENCE ADDRESS  
FOR REEXAMINATION OR SUPPLEMENTAL  
EXAMINATION AND PATENT**

Control Number(s)	90/013,733 & 90/013,735
Filing Date(s)	April 20, 2016
First Named Inventor	Jeffrey Allen Millington
Title	Street Identification for a Map Zoom of a Navigation System
Patent Number	6,178,380
Examiner Name	Banankhah, Majid A.
Attorney Docket No(s)	BN.RE006US & BN.RE006US2

**I. Power of Attorney.** This form may be used to change the Power of Attorney in a reexamination or supplemental examination proceeding (or multiple proceedings where merged). This form may also be used to change the Power of Attorney in the patent file; in such a case, a copy of this form will be placed in both the patent file and the reexamination or supplemental examination proceeding.

**A. Revocation of Previous Power of Attorney.** I hereby revoke all previous patent owner powers of attorney, if any, given:

☒ in the above-identified reexamination or supplemental examination proceeding control number(s) (more than one may be changed only if the proceedings are merged).

☒ in the file of the above-identified patent.

**(check BOTH boxes if change in BOTH the patent file and the reexamination or supplemental examination proceeding is requested).**

**B. Designation of Power of Attorney.**

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the Customer Number identified in the box at right as my/our attorney(s) or agent(s) to prosecute the proceeding(s)/patent identified above and selected in section I(A), and to transact all business in the United States Patent and Trademark Office connected therewith:

145335

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the proceeding(s) identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Authorization for the Power of Attorney is provided by the signature on page 2 of this form.

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**II. Change of Correspondence Address**

Please recognize or change the correspondence address for the above-identified reexamination or supplemental examination proceeding control number(s) (more than one may be changed **only** if they are merged proceedings) **and for the file of the above-identified patent** to be:

☒ The address associated with the above-identified Customer Number.  
OR

☐ The address associated with the Customer Number identified in the box at right:   
OR

☐ Firm or  
Individual  
Name

Address

City

State

Zip

Country

Telephone

Email

**NOTE: THE CORRESPONDENCE ADDRESS FOR THE REEXAMINATION OR SUPPLEMENTAL EXAMINATION PROCEEDING CONTROL NUMBER(S) MUST BE THE SAME AS THAT FOR THE PATENT. SEE 37 CFR 1.33.**

**III. Authorization for Power of Attorney and (if selected) Change of Correspondence Address**

I am the:

☐ Inventor, having ownership of the patent being reexamined.  
OR

☒ Patent owner.

Statement under 37 CFR 3.73(c) (Form PTO/AIA/96) submitted herewith or filed on March 30, 2012.

Signature of Inventor or  
Patent Owner

/s/Kevin Jones

Date

2017-03-14

Name

Kevin Jones

Telephone

(650) 517-5280

Title and  
Company

Attorney for Beacon Navigation GmbH

**NOTE:** Signatures of all the inventors or patent owners of the entire interest or their representative(s) are required. If more than one signature is required, submit multiple forms, check the box below, and identify the total number of forms submitted in the blank below.

☒ A total of 1 forms are submitted. If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
 United States Patent and Trademark Office  
 Address: COMMISSIONER FOR PATENTS  
 P.O. Box 1450  
 Alexandria, Virginia 22313-1450  
 www.uspto.gov

## BIB DATA SHEET

CONFIRMATION NO. 2102

<b>SERIAL NUMBER</b> 09/176,630	<b>FILING or 371(c) DATE</b> 10/22/1998 <b>RULE</b>	<b>CLASS</b> 701	<b>GROUP ART UNIT</b> 3662	<b>ATTORNEY DOCKET NO.</b> BN.P0006US		
<b>APPLICANTS</b> <b>INVENTORS</b> JEFFREY ALAN MILLINGTON, ROCHESTER HILLS, MI; <b>** CONTINUING DATA *****</b> <b>** FOREIGN APPLICATIONS *****</b> <b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b> 11/10/1998						
Foreign Priority claimed <input type="checkbox"/> Yes <input type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input type="checkbox"/> No Verified and Acknowledged <u>Examiner's Signature</u>		<input type="checkbox"/> Met after Allowance <u>Initials</u>	<b>STATE OR COUNTRY</b> MI	<b>SHEETS DRAWINGS</b> 5	<b>TOTAL CLAIMS</b> 29	<b>INDEPENDENT CLAIMS</b> 4
<b>ADDRESS</b> HELSELL FETTERMAN LLP 1001 Fourth Avenue, Suite 4200 Seattle, WA 98154 UNITED STATES						
<b>TITLE</b> STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM						
<b>FILING FEE RECEIVED</b> 1106	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			<input type="checkbox"/> All Fees		
				<input type="checkbox"/> 1.16 Fees (Filing)		
				<input type="checkbox"/> 1.17 Fees (Processing Ext. of time)		
				<input type="checkbox"/> 1.18 Fees (Issue)		
				<input type="checkbox"/> Other _____		
			<input type="checkbox"/> Credit			





# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	BN.P0006US

145335  
HELSELL FETTERMAN LLP  
1001 Fourth Avenue, Suite 4200  
Seattle, WA 98154

**CONFIRMATION NO. 2102**  
**POA ACCEPTANCE LETTER**



Date Mailed: 03/17/2017

## NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/15/2017.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/abjones/



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/176,630	10/22/1998	JEFFREY ALAN MILLINGTON	BN.P0006US

**CONFIRMATION NO. 2102**

## POWER OF ATTORNEY NOTICE



118756  
Han Santos, PLLC  
1411 4th Avenue  
Suite 910  
Seattle, WA 98101-2231

Date Mailed: 03/17/2017

## NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/15/2017.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/abjones/

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Patent No.:** 6,178,380

**Issued:** January 23, 2001

**Inventor:** Jeffrey Alan Millington

**Filed:** October 22, 1998

**Title:** STREET IDENTIFICATION FOR A  
MAP ZOOM OF A NAVIGATION  
SYSTEM

**STATUTORY DISCLAIMER IN A  
PATENT**

Mail Stop Post Issue  
Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

**STATUTORY DISCLAIMER IN A PATENT  
(37 CFR §1.321(a))**

Dear Sir:

Beacon Navigation GmbH, owner of the entire interest in the above-identified patent, hereby explicitly disclaims claims 18, 19, 28 and 31. The fee under 37 CFR §1.20(d) is submitted herewith.

Respectfully submitted,

Helsell Fetterman LLP  
Representative for Patentee

By: /Lance D. Reich/

Dated: April 10, 2017

Lance Reich  
(lreich@helsell.com; (206) 292-1144)  
Registration No. 42907

Electronic Patent Application Fee Transmittal				
Application Number:		09176630		
Filing Date:		22-Oct-1998		
Title of Invention:		STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM		
First Named Inventor/Applicant Name:		JEFFREY ALAN MILLINGTON		
Filer:		Lance Reich		
Attorney Docket Number:		BN.P0006US		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Miscellaneous:</b>				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	160	160
<b>Total in USD (\$)</b>				<b>160</b>

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	28885313
<b>Application Number:</b>	09176630
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2102
<b>Title of Invention:</b>	STREET IDENTIFICATION FOR A MAP ZOOM OF A NAVIGATION SYSTEM
<b>First Named Inventor/Applicant Name:</b>	JEFFREY ALAN MILLINGTON
<b>Customer Number:</b>	145335
<b>Filer:</b>	Lance Reich
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	BN.P0006US
<b>Receipt Date:</b>	10-APR-2017
<b>Filing Date:</b>	22-OCT-1998
<b>Time Stamp:</b>	19:10:10
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	EFT
Payment was successfully received in RAM	\$ 160
RAM confirmation Number	041117INTEFSW19300200
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	BN_P0006US-Disclaimer.pdf	848213	no	1
			e808e0fede9df38c988df506a9ae5503e35d1434		
<b>Warnings:</b>					
<b>Information:</b>					
2	Fee Worksheet (SB06)	fee-info.pdf	30257	no	2
			1e4784e36a6b9d96d9eeda73331f111d02165220		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			878470		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					