

**Invalidity of U.S. Patent No. 6,430,498 by
U.S. Patent No. 6,067,502 to Hayashida (“Hayashida”)**

I have provided below a claim chart comparing the disclosures of Hayashida to the '498 Asserted Claims, as well the combination of Hayashida and JPH10-197277 to Maruyama et al. (“Maruyama”).

Hayashida was filed August 21, 1997 and issued May 23, 2000. Hayashida therefore qualifies as prior art with regard to the '317 patent under 35 U.S.C. § 102(e) (pre-AIA).

Maruyama was published on July 31, 1998 and therefore qualifies as prior art with regard to the '317 Patent under at least 35 U.S.C. § 102(a).

U.S. Patent No. 6,430,498	Hayashida
<i>Claim 1 [Not Asserted]</i>	
1[P]. A portable terminal with the function of walking navigation, comprising:	<p>Hayashida discloses a portable terminal with the function of walking navigation, as it describes a “carrying-type navigation device.”</p> <p><i>This invention is related to a map display device to guiding and searching a movement route of a vehicle based on a map information, especially this invention is relate with the improvement of the display of the map information.</i></p> <p><i>Hayashida at 1:5-8.</i></p> <p><i>Then this navigation processing can be also executed by this computer device, if the device which can detect the present position by GPS reception device 25 and this information memory part 37 are connected with the carrying-type computer device. Moreover this invention can be applied as the vehicle except the car and the navigation device of the shipping, the aircraft and the map which is used for the navigation may be a chart and a submarine map and so on in addition to the road map. Moreover again this invention may be applied to the carrying-type navigation device in addition to the navigation device which is attached to the movement bodies such as the car. In other words, this invention may be applied to the small navigation device which can be</i></p>

	<p><i>accompanied by the human and which is used in a cycling, a travel, a mountaineering, a hike, a fishing or so on.</i></p> <p><i>Hayashida at 76:5-20.</i></p>
<p>[1(a)] a device for getting location information denoting a present place of said portable terminal;¹ and</p>	<p>Under the Court’s construction of this limitation, Hayashida discloses the function of getting location information denoting a present place of said portable terminal using a structure of a wireless or cellular antenna, a GPS, a PHS, or the like; a data receiver; and a CPU for analyzing received data; or equivalents thereof. For example, Hayashida discloses a device (i.e., CPU 2 and present position detector 20, including GPS receiver unit 25 and beacon receiver unit 26) that perform the claimed function of getting location information denoting a present place of said portable terminal.</p> <p><i>FIG. 1 illustrates the overall circuitry of the navigation device. A central processor 1 controls the operation of the whole navigation device. The central processor 1 is comprised with a CPU 2, a flush memory 3, a RAM 5, a ROM 4, a sensor input interface 7, a communication interface 8, an image (picture) processor 9, a image (picture) memory 10, a voice processor 11 and a clock (clock generator) 6. <u>The CPU 2 and the devices through up to the clock 6 are connected together through a CPU local bus 15, and the data are exchanged among these devices.</u></i></p> <p><i>Hayashida at 2:46-55.</i></p> <p><i>The sensor input interface 7 comprises an A/D converter circuit or a buffer circuit. The sensor input interface 7 receives analog or digital sensor data from the sensors 21 to 24 of a present position detector 20. The present position detector 20 includes an absolute direction sensor 21, a relative direction sensor 22, a distance sensor 23 and a vehicle speed sensor 24.</i></p> <p><i>Hayashida at 7:24-30.</i></p>

¹ The Court construed this element as:

“Function: getting location information denoting a present place of said portable terminal

Structure: a wireless or cellular antenna, a GPS, a PHS, or the like; a data receiver; and a CPU for analyzing received data; or equivalents thereof.”

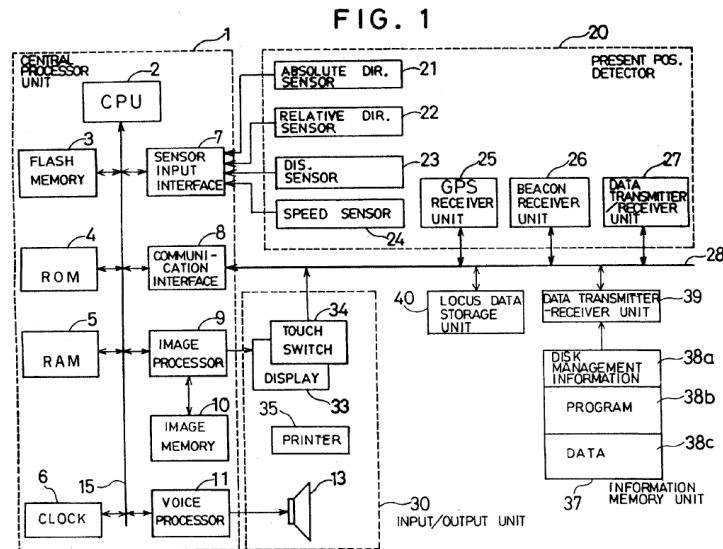
*An I/O data bus 28 is connected to the communication interface 8 of the central processor 1. To the I/O data bus 28 are connected the **GPS receiver unit 25, the beacon receiver unit 26 and the data transmitter/receiver unit 27 of the present position detector 20.** To the I/O data bus 28 are further connected a touch switch 34 and a printer 35 of the input/output unit 30, and an information memory unit 37. That is, a variety of data are exchanged between the external accessory equipment and the CPU local bus 15 through the communication interface 8.*

The present position detector 20 outputs data for detecting the present position of the car. In other words, the absolute direction sensor 21 detects the absolute direction. The relative direction sensor 22 detects the relative direction with respect to the absolute direction. Furthermore, the distance sensor 23 detects the distance travelled. The vehicle speed sensor 24 detects the running speed of the car. The GPS receiver unit 25 receives GPS (Global Positioning System) signals to detect position data such as longitude and latitude of the car. The GPS signals are microwaves transmitted from a plurality of satellites orbiting round the earth.

Similarly the beacon receiver unit 26 receives beacon from a data offering system such as VICS (Vehicle Information and Communication System) or the like, and the received data and the corrected data of GPS are output to the I/O data bus 28.

The data transmitter/receiver unit 27 exchanges a variety of information related to the present position or the road conditions near the car relative to the bi-directional present position information offering system or the ATIS (advanced traffic information service), etc. by utilizing a cellular phone, FM multiplex signals or a telephone circuit. These information are used as a detecting information of the car position or a support information of movement. The beacon receiver unit 26 and the data transmitter/receiver unit 27 may not be provided. As for this data sending and the data transmitter/receiver unit 27, a

radio receiver, a television receiver, a carrying telephone, a pager or the other radio communication machine are used.
Hayashida at 7:50-8:21.



Id. at Fig. 1.

FIG. 3 illustrates some of a group of data stored in the RAM 5. The present position data MP represent the present position of the vehicle and are detected by a present position detector 20. The absolute direction data ZD represents the south-north direction relying upon the terrestrial magnetism and are found based upon the data from an absolute direction sensor 21. The relative direction angle data $D\theta$ represent an angle of the direction in which the vehicle is traveling with respect to the absolute position data ZD and are found based upon the data from a relative direction sensor 22.

	<p><i>The traveled distance data ML represent a distance traveled by the vehicle and are found based on the data from a distance sensor 23. The present position data PI are related to the present position and are input from a beacon receiver 26 or the data transmitter-receiver 27. The VICS data VD and ATIS data AD are input from the beacon receiver 26 or the data transmitter-receiver 27. The VICS data VD are used for correcting an error in the position of the vehicle detected by a GPS receiver 25. The ATIS data AD are used for determining traffic regulations and traffic jamming in the areas.</i></p> <p><i>Hayashida at 10:55-11:8.</i></p> <p><i>Then a processing for detecting the present position (step SA2) and the subsequent processing are executed. The processing for detecting the present position (step SA2) detects the geographical coordinates (latitude, longitude, altitude, etc.) of an overland moving body, i.e., of a vehicle mounting the navigation device. That is, a GPS receiver 25 receives signals from a plurality of satellites orbiting around the earth, detects coordinate positions of the satellites, times at which the electromagnetic waves are emitted from the satellites and the time at which the electromagnetic waves are received by the GPS receiver 25, and calculates the distances to the satellites. The coordinate position of the vehicle is calculated from the distances to the satellites, to detect the present position of the vehicle. The thus found geographical coordinate data of the vehicle are stored in the RAM 5 as present position data MP. The present position data MP are often corrected by the data input through a beacon receiver 26 or the data transmitter/receiver 27.</i></p> <p><i>Hayashida at 13:16-33; see also id. at Fig. 5.</i></p>
[1(b)] a device for getting direction information denoting an orientation of said portable terminal, ² wherein	<p>Under the Court's construction of this limitation, Hayashida discloses the function of getting direction information denoting an orientation of said portable terminal using a structure of a compass, gyroscope, and/or sensor such as a clinometer in conjunction with a CPU, or equivalents thereof. Hayashida discloses a device (i.e., present position detector 20, including absolute</p>

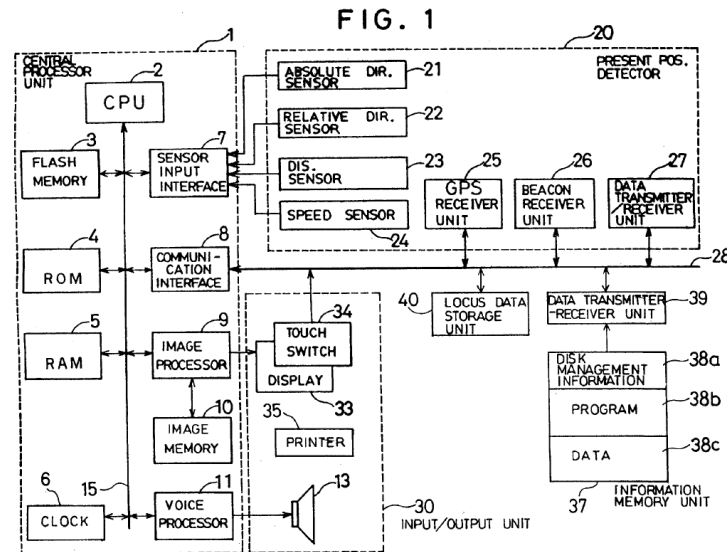
² The Court construed this element as:

	<p>direction sensor 21 (terrestrial magnetism sensor) and relative direction sensor 22 (gyroscope), and CPU 2) that performs the claimed function of getting direction information denoting an orientation of said portable terminal. A PHOSITA would have understood geomagnetic sensor as taught by Hayashida to refer to a compass.</p> <p><i>FIG. 1 illustrates the overall circuitry of the navigation device. A central processor 1 controls the operation of the whole navigation device. The central processor 1 is comprised with a CPU 2, a flush memory 3, a RAM 5, a ROM 4, a sensor input interface 7, a communication interface 8, an image (picture) processor 9, a image (picture) memory 10, a voice processor 11 and a clock (clock generator) 6. <u>The CPU 2 and the devices through up to the clock 6 are connected together through a CPU local bus 15, and the data are exchanged among these devices.</u></i></p> <p><i>Hayashida at 2:46-55.</i></p> <p><i>The sensor input interface 7 comprises an A/D converter circuit or a buffer circuit. The sensor input interface 7 receives analog or digital sensor data from the sensors 21 to 24 of a present position detector 20. The present position detector 20 includes an absolute direction sensor 21, a relative direction sensor 22, a distance sensor 23 and a vehicle speed sensor 24.</i></p> <p><u>The absolute direction sensor 21 is, for example, a terrestrial magnetism sensor and detects terrestrial magnetism.</u> <i>The absolute direction sensor 21 outputs data indicating a south-and-north direction which serves as the absolute direction. <u>The relative direction sensor 22 is, for example, a steering angle sensor and detects the steering angle of the wheel based upon a gyroscope such as optical fiber gyroscope or piezo-electric vibration gyroscope.</u> The relative direction sensor 22 outputs a relative angle of a direction of progress of the car with respect to the absolute direction detected by the absolute direction sensor 21.</i></p>
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“**Function:** getting direction information denoting an orientation of said portable terminal

Structure: a compass, gyroscope, and/or sensor such as a clinometer in conjunction with a CPU, or equivalents thereof.”

Hayashida at 7:24-42.



Id. at Fig. 1.

The present position detector 20 outputs data for detecting the present position of the car. In other words, the absolute direction sensor 21 detects the absolute direction. The relative direction sensor 22 detects the relative direction with respect to the absolute direction. Furthermore, the distance sensor 23 detects the distance travelled. The vehicle speed sensor 24 detects the running speed of the car. The GPS receiver unit 25 receives GPS (Global Positioning System) signals to detect position data such as longitude and latitude of the car. The GPS signals are microwaves transmitted from a plurality of satellites orbiting round the earth.

Hayashida at 7:60-8:3.

	<p><i>FIG. 3 illustrates some of a group of data stored in the RAM 5. The present position data MP represent the present position of the vehicle and are detected by a present position detector 20. The absolute direction data ZD represents the south-north direction relying upon the terrestrial magnetism and are found based upon the data from an absolute direction sensor 21. The relative direction angle data Dθ represent an angle of the direction in which the vehicle is traveling with respect to the absolute position data ZD and are found based upon the data from a relative direction sensor 22.</i></p> <p><i>Hayashida at 10:55-64.</i></p> <p><i>In the processing for detecting the present position (step SA2), furthermore the absolute direction data ZD, relative direction angle data D θ and the traveled distance data ML are simultaneously found by using an absolute direction sensor 21, a relative direction sensor 22 and a distance sensor 23. The absolute direction data ZD, relative direction angle data Dθ and traveled distance data ML are operated to determine the position of the vehicle. The thus determined position of the vehicle is collated with map data stored in a data 38c of the information memory unit 37, and the present position on the map screen is corrected and is indicated more correctly. Therefore, the present position of the vehicle is correctly indicated even when the GPS signals are not received such as traveling through a tunnel.</i></p> <p><i>Hayashida at 13:34-47; see also id. at Fig. 5.</i></p>
<p>[1(c)(i)] a direction and a distance of a destination from said present place are denoted with an orientation and a length of a line that is distinguished between starting and ending points</p>	<p>Hayashida discloses a direction and a distance of a destination from said present place are denoted with an orientation of a line (i.e., a heads up display) and a length of a line (i.e., whole route, route segments, or return route) that is distinguished between starting (i.e., current position) and ending points (destination marker 152 or confluence marker 262). More generally, Hayashida discloses a number of ways to present the user's current direction and direction to the destination, including: (1) a route line and a pointer symbol indicating the user's current direction, along with a compass graphic showing north (e.g., Fig. 16); (2) an arrow pointing to the destination and a pointer symbol indicating the user's current direction, along with a compass graphic showing north (e.g., Fig. 17); and (3) a route line and a pointer symbol indicating the user's current direction, along with text describing distance to the destination (e.g., Fig. 32-33)</p>

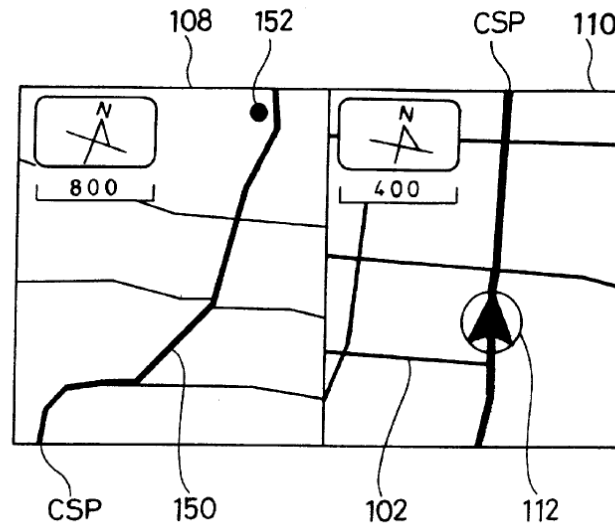
(1) When a single screen (a 1st screen) is divided (step SC4), a map of head up or a map at north up is shown in one of the screens (a 2nd screen) which were divided (Steps SC20, SC22). A present position of a car and distance to a direction, a destination of a destination etc. are shown in the other which divided screen (a 3rd screen) (step SC24). This is a simple map where necessary and minimum information is displayed. After this, an other guidance/display processing is executed (step SC18).

Hayashida at 5:66-6:7; see also id. at 3:9-16; 6:8-16.

FIG. 16 shows the 2nd screen 108 where the guide route from crossing point CSP to destination 152 is displayed by the display processing of this whole route (fore). In this way, in the display processing of the whole route (fore), a whole guide route in front of the crossing point CSP which is a end of the guide route of the 3rd screen is shown in the 2nd screen.

Hayashida at 21:57-63; see also id. at 21:7-56.

FIG. 16



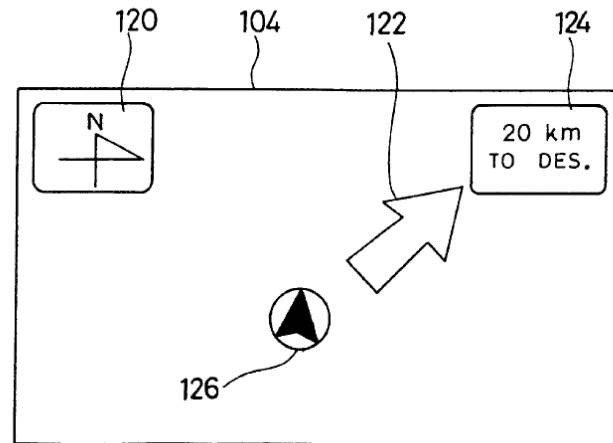
Hayashida at Fig. 16; see also *id.* at Figs. 6-15, 14.

FIG. 17 shows the simple map which is displayed in the screen of display 33. A symbol 120 which designates the absolute direction (a north of a terrestrial magnetism), a symbol 126 which designates the present position of the car, an arrow 122 which designates a direction to the destination, and characters 124 which designates a distance to the destination are shown in screen 104. Such a simple map may be shown in either of the 1st, the 2nd and/or the 3rd screen.

Furthermore, this simple map isn't limited to the one of FIG. 17, e.g. a traveling direction of the car may be always point up in the screen 104. In this case, a symbol 120 which designates the absolute direction is turned on screen 104 according to relative azimuth data $D\theta$.

Hayashida at 22:32-44; see also *id.* at 21:64-22:31.

FIG. 17

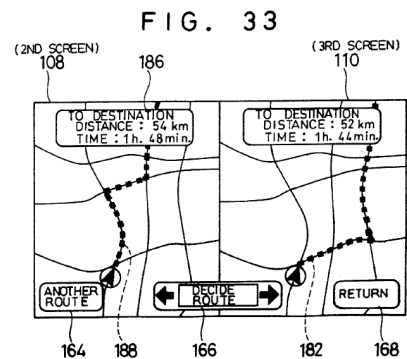
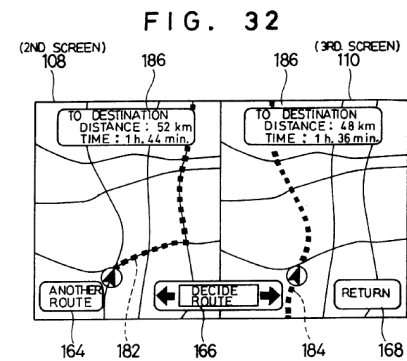


Hayashida at Fig. 17.

FIG. 32 shows the other example of FIG. 24 and FIG. 25 of the 4th embodiment and FIG. 30 of the 5th embodiment. **In this example, a distance and time information 186 are shown with the guide route. This distance and time information indicate a distance and required time to the end point of guide route. For example this distance and time information are the distance according to the route and the required time to travel this distance by the prescribed speed, when traveling guide route 182 to the end point of guide route in FIG. 32.**

Travelling distance to the end point of the guide route 184 and traveling time is also shown in the 3rd screen 110 of FIG. 32 as the distance and time information 186. FIG. 33 shows the guide route which is changed from FIG. 32 when the step SL26 etc. of FIG. 22 is executed. The distance and time information 186 of this FIG. 33 indicate the travelling distance and the required

	<p><i>time to the end point of the guide route 188. Furthermore the 3rd screen 110 of FIG. 33 is copied from the 2nd screen of FIG. 32.</i></p> <p><i>Further in the FIGS. 32 and 33 the distance and time information 186 may include the VICS information (construction information or information at the congestion road in the route etc.) which is received by data sending and the data transmitter/receiver unit 27 and may include the number of times of the turning right or left in the this route and so on. This VICS information can include congestion information at a parking lot around the route and so on.</i></p> <p><i>Hayashida at 34:49-35:8.</i></p>
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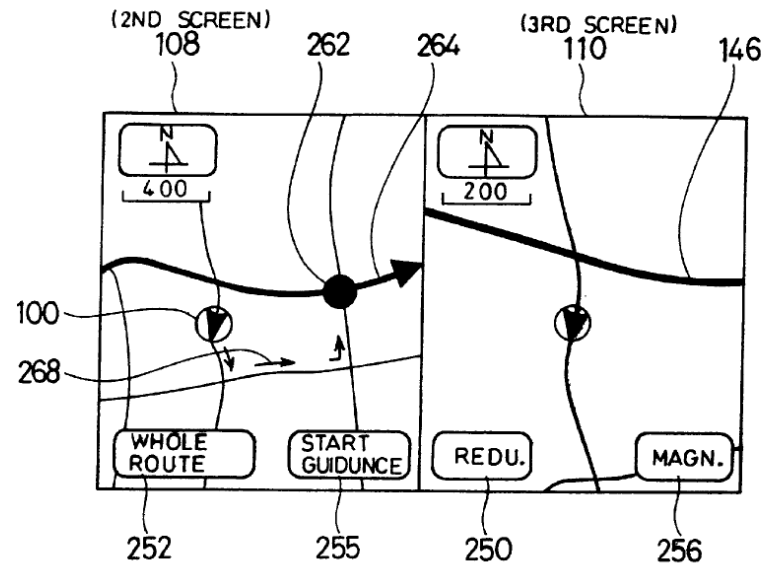


Hayashida at Figs. 32 and 33.

FIG. 46 shows the application example of the display of the 2nd screen. For example, the return route is shown by arrow 268. Further when the return route isn't displayed in the 2nd screen, only the confluence which the return route and the previous route cross may be shown by mark 262. Further the confluence may be also shown by mark 262 when the return route is displayed. Moreover, the direction of the destination in the previous guide route may be shown by a direction mark 264 of the destination.

Hayashida at 49:3-11.

FIG. 46



Id. at Fig. 46; see also *id.* at Figs. 38 and 39.

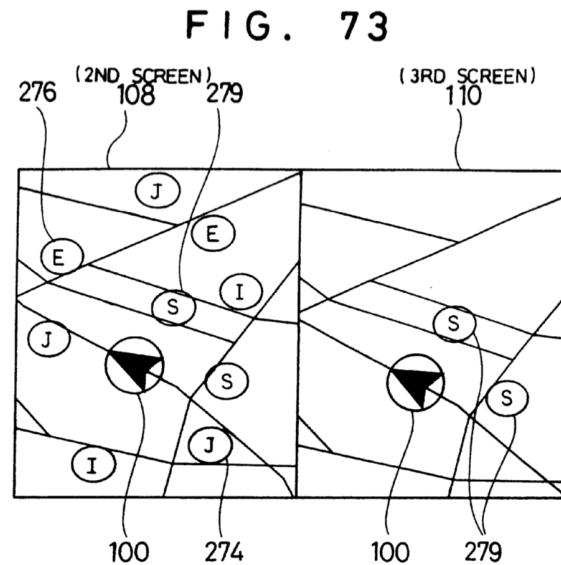
Next the processing to display the direction mark 264 of the destination which shows the direction of the destination in the computed intersection point CP is executed. For example, this processing is executed as follows. The character pattern data of the arrow which is used for the direction mark of the destination is stored in the information memory unit 37 or the ROM 4. Then the character pattern of the arrow is turned to show the above direction of the destination according to the above intersection point data CP. This character pattern data is sent to image processor 9 and is changed into the image data. Therefore the direction mark of the destination 264 is shown in the coordinate which is designated by the intersection point data CP. Actually as the tip of the arrow

agree with the coordinate of the intersection point data CP, A deviation to the intersection point data CP is provided for the coordinate of the direction mark of the destination.

Hayashida at 49:44-60.

Further when the specification of the brand (the sales article) of the gasoline station is executed in step SX18 of FIG. 49, as shown in FIG. 73, the map of all the facilities which correspond to the genre which is chosen in the step SX12 may be shown in 2nd screen 108. In this processing, all gasoline stations which are in the specific area are shown in the 2nd screen. Moreover only the gasoline station which treats the specific brand (the sales article) which is specified in the step SX18 is shown at the map of the 3rd screen.

Hayashida at 54:4-12.

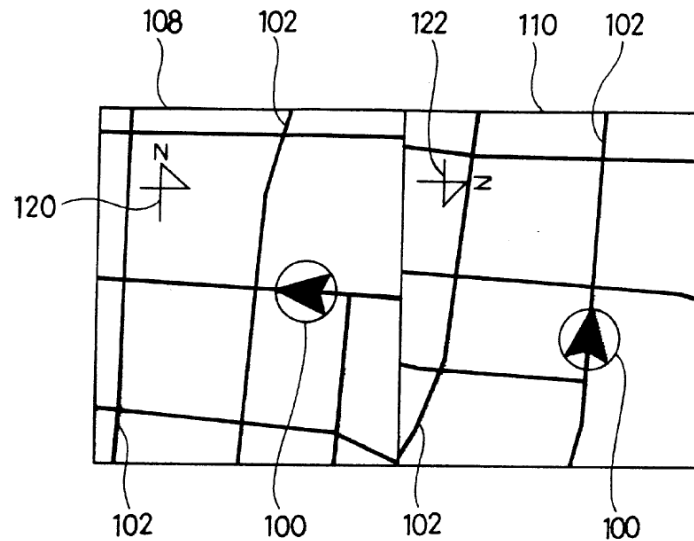


Id. at Fig. 73; see also id. at Figs. 51 and 52.

	<p><i>In the above facility setting processing, the facilities may be retrieved in the whole area of the map information based on the guide route and the retrieving may be executed only in the specific area which is described later. In case of along guide route, the person who is traveling a route can drop in the requested facilities without deviating far from the route. Further if facilities within the requested range from the standard point (the present place, the destination or the cursor position and so on) are chosen and shown, the required information and the required retrieving result are provided quickly and clearly to the user. Further when an extracting result of the facilities is displayed in the screen, if various information of distance and position relation between each of the facilities and the guide route or distance from each of the facilities to the destination and so on is together shown, the position of the required facilities to the guide route can be grasped clearly.</i></p> <p>Hayashida at 58:27-43.</p>
<p>[1(c)(ii)] to supply route guidance information as said walking navigation information.</p>	<p>Hayashida discloses supplying route guidance information as said walking navigation information.</p> <p><i>This guide/display processing is the processing to report the information to make travel the car along the guide route. In other words, a guide route is searched and this searched guide route is shown in display 33. This guide route is displayed for the car to become always a screen center and an information about points which should turn right or left in the guide route is reported at any time. In this guide/display processing, various information is reported and is shown at any time for the car to travel a guide route smoothly.</i></p> <p>Hayashida at 14:56-65.</p> <p><i>Then this navigation processing can be also executed by this computer device, if the device which can detect the present position by GPS reception device 25 and this information memory part 37 are connected with the carrying-type computer device. Moreover this invention can be applied as the vehicle except the car and the navigation device of the shipping, the aircraft and the map</i></p>

	<p>which is used for the navigation may be a chart and a submarine map and so on in addition to the road map. <u>Moreover again this invention may be applied to the carrying-type navigation device</u> in addition to the navigation device which is attached to the movement bodies such as the car. In other words, this invention may be applied to the small navigation device which can be accompanied by the human and which is used in a cycling, a travel, a mountaineering, a hike, a fishing or so on.</p> <p>Hayashida at 76:5-20.</p>
Claim 3	
<p>3. A portable terminal with the function of walking navigation according to claim 1, wherein said device for getting direction information gets orientation information of a display of said portable terminal.</p>	<p>Because the display of the device described by Hayashida is fixed-mounted, Hayashida necessarily obtains the orientation of its display when it obtains the orientation of its device. See limitation [1(b)]. In addition, Hayashida discloses a heads up display mode where the map rotates so the user's position is always pointing upwards.</p> <p><i>FIG. 20 shows a divided screen of this 2nd embodiment. A head up map is shown in the 1st screen before the division as shown in FIG. 9. When instructing to divide the screen, the north up map is displayed in the 2nd screen 108, in this 2nd screen 108, a symbol 120 which shows an absolute azimuth points up and a symbol 100 which shows the direction of the traveling by the car points to the left.</i></p> <p><i>Also the head up map is displayed in the 3rd screen 110 and a symbol 100 which designates the direction of the traveling by the car points up in the 3rd screen and a symbol 122 which designates a northern direction points to the right in the 3rd screen.</i></p> <p>Hayashida at 24:9-20.</p>

FIG. 20



Hayashida at Fig. 20; *see also id.* at Figs. 19 and 21.

Therefore guidance information with a higher importance is displayed with priority at a divided screen near a driver and supplementary guide route information is shown in a divided screen near a assistant's seat. Furthermore, a map at a north up may be shown in addition to the map of the head up in the 1st, the 2nd and/or the 3rd screen of the above embodiment. In the head up, a direction of a traveling by the car always points up in the screen map and in the north up, a north of a absolute direction always points up in the screen map.

Hayashida at 22:22-31.

Claim 10 [Not Asserted]

10. A portable terminal with the function of walking navigation, comprising:	See Claim 1[P].
[10(a)] a device for getting location information denoting a present place of said portable terminal; ³ and	See claim limitation [1(a)].
[10(b)] a device for getting direction information denoting an orientation of said portable terminal, ⁴	See claim limitation [1(b)].
[10(c)] wherein location of a user is of said portable terminal is determined according to said location information and said direction information,	<p>Hayashida teaches location of a user is of said portable terminal is determined according to said location information and said direction information.</p> <p><i>The sensor input interface 7 comprises an A/D converter circuit or a buffer circuit. The sensor input interface 7 receives analog or digital sensor data from the sensors 21 to 24 of a present position detector 20. <u>The present position detector 20 includes an absolute direction sensor 21, a relative direction sensor 22, a distance sensor 23 and a vehicle speed sensor 24.</u></i></p> <p>Hayashida at 7:24-30.</p>

³ The Court construed this element as:

“Function: getting location information denoting a present place of said portable terminal

Structure: a wireless or cellular antenna, a GPS, a PHS, or the like; a data receiver; and a CPU for analyzing received data; or equivalents thereof.”

⁴ The Court construed this element as:

“Function: getting direction information denoting an orientation of said portable terminal

Structure: a compass, gyroscope, and/or sensor such as a clinometer in conjunction with a CPU, or equivalents thereof.”

The present position detector 20 outputs data for detecting the present position of the car. In other words, the absolute direction sensor 21 detects the absolute direction. The relative direction sensor 22 detects the relative direction with respect to the absolute direction. Furthermore, the distance sensor 23 detects the distance travelled. The vehicle speed sensor 24 detects the running speed of the car. The GPS receiver unit 25 receives GPS (Global Positioning System) signals to detect position data such as longitude and latitude of the car. The GPS signals are microwaves transmitted from a plurality of satellites orbiting round the earth.

Similarly the beacon receiver unit 26 receives beacon from a data offering system such as VICS (Vehicle Information and Communication System) or the like, and the received data and the corrected data of GPS are output to the I/O data bus 28.

The data transmitter/receiver unit 27 exchanges a variety of information related to the present position or the road conditions near the car relative to the bi-directional present position information offering system or the ATIS (advanced traffic information service), etc. by utilizing a cellular phone, FM multiplex signals or a telephone circuit. These information are used as a detecting information of the car position or a support information of movement. The beacon receiver unit 26 and the data transmitter/receiver unit 27 may not be provided. As for this data sending and the data transmitter/receiver unit 27, a radio receiver, a television receiver, a carrying telephone, a pager or the other radio communication machine are used.

Hayashida at 7:50-8:21.

FIG. 3 illustrates some of a group of data stored in the RAM 5. The present position data MP represent the present position of the vehicle and are detected by a present position detector 20. The absolute direction data ZD represents the south-north direction relying upon the terrestrial magnetism and are found based upon the data from an absolute direction sensor 21. The relative direction angle data Dθ represent an angle of the direction in which the vehicle

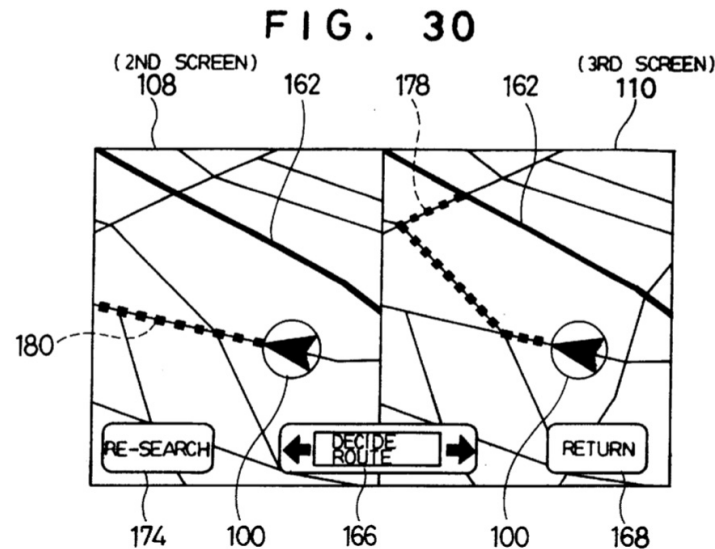
	<p><i>is traveling with respect to the absolute position data ZD and are found based upon the data from a relative direction sensor 22.</i></p> <p><i>The traveled distance data ML represent a distance traveled by the vehicle and are found based on the data from a distance sensor 23. The present position data PI are related to the present position and are input from a beacon receiver 26 or the data transmitter-receiver 27. The VICS data VD and ATIS data AD are input from the beacon receiver 26 or the data transmitter-receiver 27. The VICS data VD are used for correcting an error in the position of the vehicle detected by a GPS receiver 25. The ATIS data AD are used for determining traffic regulations and traffic jamming in the areas.</i></p> <p><i>Hayashida at 10:55-11:8.</i></p> <p><i>Then a processing for detecting the present position (step SA2) and the subsequent processing are executed. The processing for detecting the present position (step SA2) detects the geographical coordinates (latitude, longitude, altitude, etc.) of an overland moving body, i.e., of a vehicle mounting the navigation device. That is, a GPS receiver 25 receives signals from a plurality of satellites orbiting around the earth, detects coordinate positions of the satellites, times at which the electromagnetic waves are emitted from the satellites and the time at which the electromagnetic waves are received by the GPS receiver 25, and calculates the distances to the satellites. The coordinate position of the vehicle is calculated from the distances to the satellites, to detect the present position of the vehicle. The thus found geographical coordinate data of the vehicle are stored in the RAM 5 as present position data MP. The present position data MP are often corrected by the data input through a beacon receiver 26 or the data transmitter/receiver 27.</i></p> <p><i>In the processing for detecting the present position (step SA2), furthermore the absolute direction data ZD, relative direction angle data $D\theta$ and the traveled distance data ML are simultaneously found by using an absolute direction sensor 21, a relative direction sensor 22 and a distance sensor 23. The absolute direction data ZD, relative direction angle data $D\theta$ and traveled distance data</i></p>
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	<p><i>ML are operated to determine the position of the vehicle. The thus determined position of the vehicle is collated with map data stored in a data 38c of the information memory unit 37, and the present position on the map screen is corrected and is indicated more correctly. Therefore, the present position of the vehicle is correctly indicated even when the GPS signals are not received such as traveling through a tunnel.</i></p> <p><i>Hayashida at 13:15-47.</i></p>
[10(d)] wherein location of a partner of the user is determined according to a location information from the partner's portable terminal, and	<p>It would have been obvious to PHOSITA to modify Hayashida to determine the location of partner of the user according to a location information from the partner's portable terminal as taught by Maruyama. <i>See</i> corresponding claim limitation of Exhibit D2. A PHOSITA would have been motivated to modify Hayashida with the teachings of Maruyama for the reasons discussed in Section VI.B of my Report. These include, for example, to increase the versatility of the portable terminal, allowing users to navigate to other users who serve as destinations. Because Hayashida already suggests utilizing a central server to obtain information, such a modification would not have required undue experimentation and would have yielded predictable results.</p>
[10(e)(i)] wherein a full route from said starting point to said destination is shown with a bent line that is distinguished between starting and ending points and said present place is shown with a symbol on said line	<p>Hayashida teaches that a full route from said starting point to said destination is shown with a bent line that is distinguished between starting and ending points (e.g., destination 152) and said present place is shown with a symbol on said line (symbol 100).</p> <p><i>Moreover the route which is displayed in the 2nd screen or the 3rd screen may be fixed, for example, the previous route immediately before another route is re-searched may be always shown in the 3rd screen. The reduced scale of the map which is displayed in the 2nd screen and the 3rd screen isn't especially limited. In order to display the whole route from the present position of the car to the destination in each whole divided screen, the reduced scale may be automatically adjusted. Or using the reduced scale before the screen division, the map of each divided screen may be shown.</i></p> <p><i>Hayashida at 30:39-48.</i></p> <p><i>FIG. 16 shows the 2nd screen 108 where the guide route from crossing point CSP to destination 152 is displayed by the display processing of this whole</i></p>

Hayashida at 21:57-63.

Further, the guide/display processing of FIG. 27 is repeated until the car reaches the end point of guide route. Furthermore, the reduced scale of the map which is displayed in the 2nd screen and the 3rd screen isn't especially limited at this embodiment, when another re-searched route is displayed, the whole route may be shown on the screen. Or with the reduced scale of the map which was displayed in the 1st screen before the division, the map of the 2nd screen and the 3rd screen may be shown.

Hayashida at 32:36-44.



Hayashida at Fig. 30; *see also id.* at Figs. 16, 24, 25, 27, 29-33, 42, and 44- 46.

FIG. 40 shows the condition of the display 33 immediately after the car deviates from the guide route 146 which is searched first. Symbol 100 designates the present position and the traveling direction of the car. The screen of display 33 before this division is a 1st screen. Icons 250, 256 and 252 with the letter "reduction", "magnification" and "whole route" and so on are shown in the lower part of the 1st screen. When the icon 250 of "reduction" is touched by the operator, the reduced scale of the map which is displayed in the 1st screen is made small and a wide area map is shown.

Hayashida at 37:10-26 .

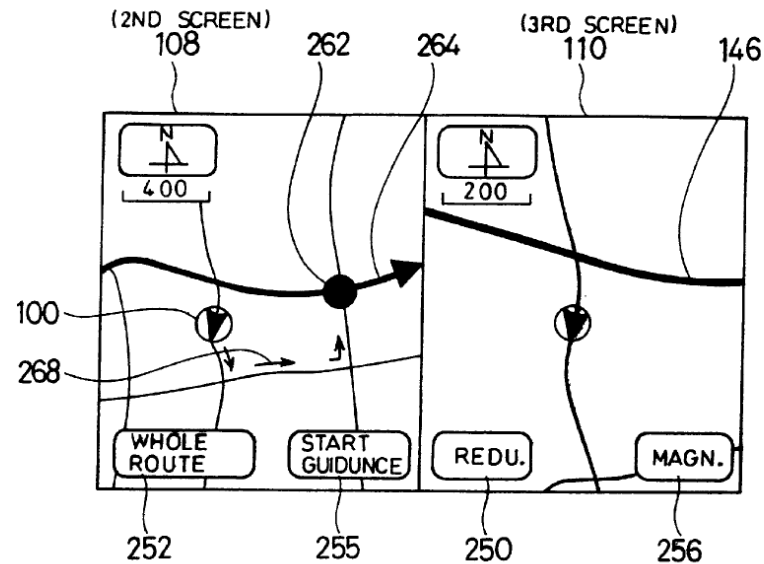
When the car isn't traveling the re-searched route, it also includes when the whole route isn't re-searched at all. Therefore if the car isn't traveling the re-searched new route, **the whole route to the end point of guide route from the present position of the car is re-searched (step SR20). Then, the re-searched new whole route is shown in the 3rd screen.** Furthermore, the previous guide route which the car deviates from may be together shown in this 3rd screen. The display reduced scale of this 3rd screen is may be the same as the reduced scale of the 1st screen before the division. When the new whole route is displayed, the reduced scale is adjusted and the whole route may be shown in the screen. When this newer whole route is displayed, like FIGS. 32 and 33 of the 5th embodiment the peculiar information in the newly searched route also may be together shown. In other words, the information of the distance with the full length of the route from the present position of the car to the destination, the expected traveling required time, the name of the principal road, the name of the principal intersection and so on may be together shown. The peculiar information in this new route may be shown in the list form by the choosing of a operator.

Hayashida at 40:15-36.

FIG. 46 shows the application example of the display of the 2nd screen. For example, the return route is shown by arrow 268. Further when the return route isn't displayed in the 2nd screen, only the confluence which the return route and the previous route cross may be shown by mark 262. Further the confluence

may be also shown by mark 262 when the return route is displayed. Moreover, the direction of the destination in the previous guide route may be shown by a direction mark 264 of the destination.
Hayashida at 49:3-11.

FIG. 46



Id. at Fig. 46; see also *id.* at Figs. 38 and 39.

Next the processing to display the direction mark 264 of the destination which shows the direction of the destination in the computed intersection point CP is executed. For example, this processing is executed as follows. The character pattern data of the arrow which is used for the direction mark of the destination is stored in the information memory unit 37 or the ROM 4. Then the character pattern of the arrow is turned to show the above direction of the destination

according to the above intersection point data CP. This character pattern data is sent to image processor 9 and is changed into the image data. Therefore the direction mark of the destination 264 is shown in the coordinate which is designated by the intersection point data CP. Actually as the tip of the arrow agree with the coordinate of the intersection point data CP, A deviation to the intersection point data CP is provided for the coordinate of the direction mark of the destination.

Hayashida at 49:44-60.

The operation by the operator according to the icon may be also distinguished in the steps SB4, SB10, SE4, SE12, SG10 and SG4 in addition to the above matter. This icon is "whole route display" in the step SG10, "fore route display" in the step SE12, "reduced scale change" in the step SG4 and SE4, "screen division" in the step SB10 and "division cancellation" in the step SB4.

Hayashida at 72:15-21.

*In addition to the above, in every divided screen, the icon of "details", "outline", "intersection", "direction of map", "screen division", "reduced scale change", "fore route display", **"whole route display"** and so on may be displayed, a switch according to this icon may be operated by the operator and the display contents may be individually switched every divided screen.*

Hayashida at 73:4-10.

When an area map is displayed in the 3rd screen 110 of display 33, each of facilities are displayed in the specified area using the figure symbol which was memorized in the flash memory 3 (step SX96). The facility list data 70 of FIG. 62 is used in the display of these facilities. A specific symbol is displayed in the geographical coordinate of each of the facilities. For example, this symbol is a star, a circle, a triangle, a square, a fork, a glass, a bag, a flag and a house and so on. Further only when the area map which was most expanded is displayed into the 3rd screen of display 33, this facilities may be displayed.

Hayashida at 64:32-42.

	<p><i>FIG. 46 shows the application example of the display of the 2nd screen. For example, the return route is shown by arrow 268. Further when the return route isn't displayed in the 2nd screen, only the confluence which the return route and the previous route cross may be shown by mark 262. Further the confluence may be also shown by mark 262 when the return route is displayed. Moreover, the direction of the destination in the previous guide route may be shown by a direction mark 264 of the destination.</i></p> <p>Hayashida at 49:3-11</p> <p><i>(8) In addition to the above matter, the map which is the displayed in the 3rd screen may be the map information which shows around the car, the start point, the destination, the dropping in place or the chosen optional part. Then the map which connects with one azimuth of all the azimuths of the map which is displayed in this 3rd screen may be displayed in the 2nd screen. In other words, a map around the destination (the dropping in place, the specification place or so on) is displayed in the 3rd screen. <u>Moreover the map which is connected with the map of this 3rd screen and contains the guide route which connects from the start point to the destination may be displayed in the 2nd screen.</u></i></p> <p>Hayashida at 74:41-52.</p>
[10(e)(ii)] to supply said route guidance information as said walking navigation information.	See claim limitation [1(c)(ii)].
Claim 13	
13. The portable terminal with said function of walking navigation according to claim 10, wherein said device for getting direction information gets orientation information of	See Claim 3.

a display of said portable terminal.	
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