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- (81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,

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Published:

— with international search report (Art. 21(3))

- (54) Title: OPERATING DEVICE FOR A VEHICLE, IN PARTICULAR A PASSENGER VEHICLE; AS WELL AS METHOD FOR OPERATING SUCH AN OPERATING DEVICE

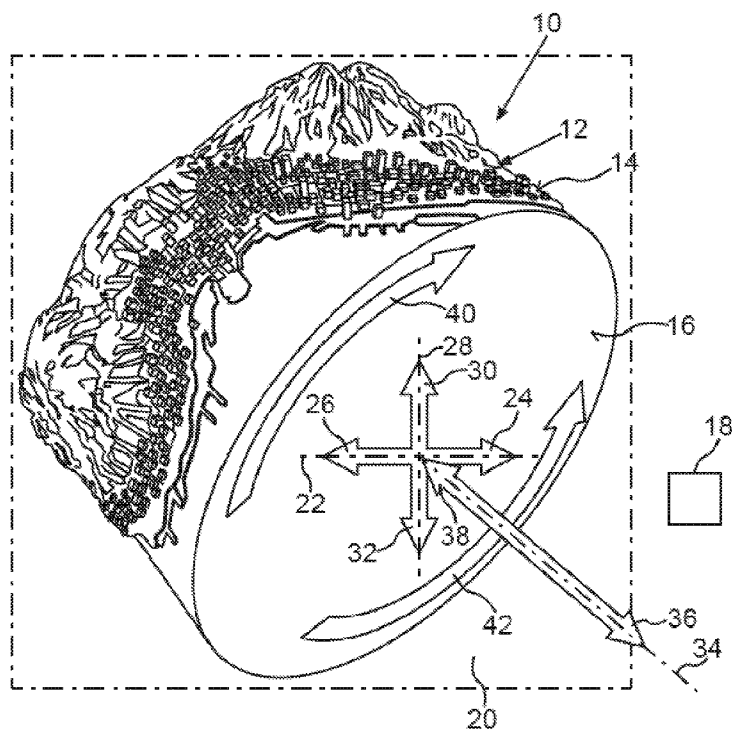


Fig. 1

- (57) Abstract: The invention relates to an operating device for a vehicle, the operating device comprising a gesture recognition unit (18) configured to recognize at least one gesture performed by a user of the vehicle, the operating device being configured to execute at least one function upon recognition of the gesture, wherein the gesture recognition unit (18) has at least one three-dimensional detection area (20), the operating device being configured to execute respective functions upon recognition of eight gestures performed within the detection area (20) by the user.

Operating Device for a Vehicle, in particular a Passenger Vehicle; as well as Method for Operating such an Operating Device

Field of the Invention

The invention relates to an operating device for a vehicle according to the preamble of patent claim 1 as well as a method for operating such an operating device according to the preamble of patent claim 8.

Background Art

Such an operating device for a vehicle, in particular a passenger vehicle, and such a method for operating an operating device are known from DE 10 2012 219 814 A1. The operating device comprises a gesture recognition unit configured to recognize at least one gesture performed by a human user of the vehicle. The operating device is configured to execute at least one function upon recognition of the gesture.

EP 1 830 244 A2 shows a method comprising selecting an audio system or an air conditioning system by an acoustic signal. A function and/or an operating condition of the selected system is set depending on a gesture of a user. The gesture for setting the audio system and the air conditioning system is adapted to a component-specific setting of the function and/or the operating condition. The gesture assigned to the function and/or the operating condition is set depending on the detection of the gesture by a detecting device.

Moreover, DE 10 2012 219 814 A1 shows a method for providing an operating input by using a head mounted display carried by a user.

Summary of the Invention

Technical problem to be solved

It is an object of the present invention to provide an operating device for a vehicle and a method for operating an operating device for a vehicle by means of which a particularly easy and comfortable operation of the operating device can be realized.

Technical solution

This object is solved by an operating device having the features of patent claim 1 as well as a method having the features of patent claim 8. Advantageous embodiments with expedient developments of the invention are indicated in the other patent claims.

A first aspect of the invention relates to an operating device for a vehicle, in particular a passenger vehicle. The operating device comprises a gesture recognition unit configured to recognize at least one gesture performed by a human user of the vehicle, the operating device being configured to execute at least one function upon recognition of the gesture.

In order to realize a particularly easy and comfortable operation of said operating device, according to the present invention the gesture recognition unit has at least one three-dimensional detection area which is, for example, arranged in the interior of the vehicle. The operating device is configured to execute respective functions upon recognition of eight gestures performed within the detection area by the user. In other words, one of said functions of the operating device can be effected or initiated by the user as the user performs the corresponding gesture within the detection area.

In the operation device according to the present invention, a first one of the gestures comprises a translational movement of a hand of the user along a first movement axis into a first direction. A second one of the gestures comprises a translational movement of the hand along the first movement axis into a second direction opposite to the first direction. In other words, the user can move their hand forwards and backwards along the first movement axis within the detection area so that, by moving their hand along the first movement axis into the first direction, a first one of said functions can be effected and, by moving the hand into the second direction along the first movement axis, a second one of the functions can be effected by the user.

A third one of the gestures comprises a translational movement of the hand of the user along a second movement axis into a third direction, the second movement axis being perpendicular to the first movement axis. A fourth one of the gestures comprises a translational movement of the hand along the second movement axis into a fourth direction opposite to the third direction. In other words, the first movement axis and the second movement axis are virtual axes extending perpendicularly in relation to each other. By moving their hand forwards and backwards along the second movement axis within the detection area, the user can effect a third one of the functions and a fourth one of the functions.

A fifth one of the gestures comprises a translational movement of the hand along a third movement axis into a fifth direction, the third movement axis being perpendicular to the first movement axis and the second movement axis. A sixth one of the gestures comprises a translational movement of the hand along the third movement axis into a sixth direction opposite to the fifth direction. This means the third

movement axis is a virtual axis extending perpendicularly to the first movement axis and the second movement axis. By moving their hand forwards and backwards along the third movement axis within the detection area, the, the user can effect a fifth one of the functions and a sixth one of the eight functions.

Moreover, a seventh one of the gestures comprises a rotational movement of the hand about the third movement axis into a first rotating direction which is a seventh direction. An eighth one of the gestures comprises a rotational movement of the hand about the third movement axis into a second rotating direction opposite to the first rotating direction, the second rotating direction being an eighth direction. For example, by rotating their hand to the left and to the right about the third movement axis within the detection area, the user can effect a seventh one of the function as and an eighth one of the functions of the operating device.

The operating device according to the present invention can be operated particularly comfortably and easily by the user since the user can perform the gestures very easily with their hand within the detection area which can be kept particularly small. Furthermore, said gestures are very easy inputs by means of which complex systems such as the operating device can be operated very easily.

In an advantageous embodiment of the invention, the gesture recognition unit is configured to be switched from a locked state into an unlocked state upon recognition of a ninth gesture performed within the detection area by the user, the gesture recognition unit being configured to detect the ninth gesture. The ninth gesture comprises a movement of two fingers of the hand of the user towards each other. In other words, the user

performs the ninth gesture by moving two fingers of their hand towards each other within the detection area. In the locked state, the recognition of said first eight gestures is omitted. In other words, when the gesture recognition unit is in the locked state the eight functions corresponding to the first eight gestures cannot be effected by performing said first eight gestures. In the unlocked state, the gesture recognition unit is ready to recognize said first eight gestures so that, in the unlocked state, the user can effect the eight functions by performing the corresponding first eight gestures within the detection area. Thereby, the risk of faulty operation can be kept particularly low since, in order to effect the eight functions, the user first needs to switch the gesture recognition unit from the locked state into the unlocked state. However, the gesture recognition unit is configured to detect the ninth gesture in the locked state.

In a particularly advantageous embodiment of the invention, the gesture recognition unit is configured to be switched from the unlocked state into the locked state upon a tenth gesture performed by the user within the detection area, the gesture recognition unit being configured to recognize the tenth gesture, wherein the tenth gesture comprises a movement of the fingers away from each other. In other words, the gesture recognition unit is switched from the unlocked state to the locked state when the user moves their fingers away from each other within the detection area. Thereby, the gesture recognition unit can be switched from the unlocked state into the locked state particularly easily so that the risk of faulty operation can be kept particularly low.

In a further advantageous embodiment of the invention, the gesture recognition unit is configured to be kept in the unlocked state as long as the fingers are kept together. This means the gesture recognition unit is

witched from the unlocked state into the locked state as soon as the user opens their fingers, i.e. moves their fingers away from each other. This also means the gesture recognition unit is ready to recognize the first eight gestures only as long as the user keeps their fingers together. Thus, the risk of faulty operation can be kept particularly low.

In a further advantageous embodiment of the invention, the operating device is configured as a navigation system for the vehicle. Such a navigation system is a very complex system which, conventionally, can be cumbersome to operate. However, the operating device according to the present invention allows for realizing a particularly easy and comfortable operation for any complex system. Thereby, the user can operate the navigation system in a fast and easy way without getting distracted from traffic.

For example, the navigation device comprises a display unit configured to show a virtual map, the functions relating to adjusting the virtual map. In other words, the virtual map can be adjusted by the user by performing said first eight gestures. For example, an area represented by the virtual map can be changed and/or enlarged and/or scaled down by performing the first eight gestures. Moreover, for example, the user can confirm or decline inputs by performing the gestures and/or navigate through a manual structure comprising different manuals and/or tabs and/or menu interfaces by performing said gestures.

A second aspect of the present invention relates to a vehicle, in particular a passenger vehicle, comprising an operation device according to the present invention. Advantages and advantageous embodiments of the first aspect of the invention are to be regarded as advantages and advantageous

embodiments of the second aspect of the invention and vice versa.

A third aspect of the invention relates to a method for operating an operating device for a vehicle, the operating device comprising a gesture recognition unit by means of which at least one gesture performed by a user of the vehicle is recognized, wherein at least one function is executed by the operating device upon recognition of the gesture.

In order to realize a particularly easy and comfortable operation of the operating device, according to the present invention the gesture recognition unit has at least one three-dimensional detection area, the operating device executing respective functions upon recognition of eight gestures performed within the detection area by the human user. Therein, a first one of the gestures comprises a translational movement of a hand of the user along a first movement axis into a first direction, a second one of the gestures comprises a translational movement of the hand along the first movement axis into a second direction opposite to the first direction, a third one of the gestures comprises a translational movement of the hand of the user along a second movement axis into a third direction, the second movement axis being perpendicular to the first movement axis, a fourth one of the gestures comprises a translational movement of the hand along the second movement axis into a fourth direction opposite to the third direction, a fifth one of the gestures comprises a translational movement of the hand along a third movement axis into a fifth direction, the third movement axis being perpendicular to the first movement axis and the second movement axis, a sixth one of the gestures comprises a translational movement of the hand along the third movement axis into a sixth direction opposite to the fifth direction, a seventh one of the gestures comprises a rotational movement of the hand about the third

movement axis into a first rotating direction, and an eighth one of the gestures comprises a rotational movement of the hand about the third movement axis into a second rotating direction opposite to the first rotating direction. Advantages and advantageous embodiments of the first aspect and the second aspect of the invention are to be regarded as advantages and advantageous embodiments of the third aspect of the invention and vice versa.

Further advantages, features and details of the invention derive from the following description of a preferred embodiment as well as from the drawing. The features and feature combinations previously mentioned in the description as well as the features and feature combinations mentioned in the following description of the figures and/or shown in the figures alone can be employed not only in the respective indicated combination but also in any other combination or taken alone without leaving the scope of the invention.

Brief Description of the Drawings

Fig. 1 a schematic perspective view of an operating device for a vehicle, the operating device comprising a gesture recognition unit configured to recognize at least eight gestures performed by a user of the vehicle within a three-dimensional detection area of the gesture recognition unit;

Fig. 2 a schematic perspective view of a hand of the human user performing a ninth gesture; and

Fig. 3 a schematic perspective view of the hand of the human user performing a tenth gesture.

Detailed Description of Embodiments

In the figures the same elements or elements having the same functions are indicated with the same reference signs.

Fig. 1 shows in a schematic perspective view an operating device in the form of a navigation system for a vehicle in the form of a passenger vehicle. The navigation system comprises a display unit 10 configured to display a virtual map 12 of, for example, the surroundings. In other words, at least a portion of the earth's surface is represented by the virtual map 12, wherein a human user of the navigation system can adjust said portion to be represented by the virtual map 12, i.e. to be displayed by the display unit 10.

In the present case, the display unit shows a role or barrel having an outer lateral circumferential surface 14 forming the three-dimensional virtual map 12 so that, for example, buildings and/or mountains arranged in the portion shown by the virtual map 12 are represented in the three-dimensional manner. Moreover, Fig. 1 shows a front surface 16 of said barrel or role.

In order to realize a particularly easy and comfortable operation of the navigation system, the navigation system comprises a gesture recognition unit 18 configured to recognize a plurality of gestures performed by the human user, wherein the navigation system is configured to execute functions upon recognition of the corresponding gestures.

The gesture recognition unit 18 has a three-dimensional detection area 20 which is arranged in the interior of the passenger vehicle, the operating device being configured to execute respective functions upon recognition of first eight gestures performed within the detection area 20 by the user.

A first one of the first eight gestures comprises a translational movement of a hand of the user along a first movement axis 22 into a first direction illustrated by a directional arrow 24. A second one of the first eight gestures comprises a translational movement of the hand along the first movement axis 22 into a second direction opposite to a first direction and illustrated by a directional arrow 26. A third one of the first eight gestures comprise a translational movement of the hand of the user along a second movement axis 28 into a third direction illustrated by a directional arrow 30, the second movement axis 28 extending perpendicularly to the first movement axis 22. A fourth one of the first eight gestures comprises a translational movement of the hand along the second movement axis 28 into a fourth direction opposite to the third direction and illustrated by a directional arrow 32. A fifth one of the first eight gestures comprises a translational movement of the hand along a third movement axis 34 into a fifth direction illustrated by a directional arrow 36, the third movement axis 34 extending perpendicularly to the first movement axis 22 and the second movement axis 28.

A sixth one of the first eight gestures comprises a translational movement of the hand along the third movement axis 34 into a sixth direction opposite to the fifth direction illustrated by directional arrow 38. A seventh one of the first eight gestures comprises a rotational movement of the hand about the third movement axis 34 into a first rotating direction illustrated by a directional arrow 40. Moreover, an eighth one of the first eight gestures comprises a rotational movement of the hand about the third movement axis 34 into a second rotating direction opposite to the first rotating direction and illustrated by a directional arrow 42. Thus, a four-plus-four gesture operation is realized to operate the navigation

system.

For example, the first movement axis 22 corresponds to the transverse direction of the vehicle. The second movement axis 28 corresponds to the vertical direction of the vehicle and the third movement axis 34 corresponds to the longitudinal direction of the vehicle. Moreover, for example, by moving their hand along the first movement axis 22, i.e. to the left and to the right the virtual map 12 and/or the barrel can be moved to the left and to the right. By moving the hand along the second movement axis 28, i.e. up and down, for example, the virtual map 12 and/or the barrel can be moved up and down. By rotating the hand about the third movement axis 28 into the first rotation direction, i.e. clockwise, for example, the scale of the virtual map 12 can be enlarged. Moreover, by rotating the hand about the third movement axis 34 into the second rotating direction, i.e. counter-clockwise, for example, the scale of the virtual map 12 can be decreased.

Alternatively or additionally, the user can navigate through a menu structure of a graphical user interface (GUI) of the navigation system by performing the gestures within the detection area 20. For example, by moving the hand along the third movement axis 34 into the fifth direction, i.e. forwards, the user can confirm an input into the navigation system. Moreover, by moving the hand along the third movement axis 34 into the sixth direction, i.e. backwards, for example, the user can decline inputs and/or navigate to previous menu interfaces of the navigation system. The gesture recognition unit 18 is configured to be switched from a locked state into an unlocked state upon recognition of a ninth gesture performed within the detection area 20 and illustrated in Fig. 2, the ninth gesture comprising a movement of two fingers 44 and 46 of the hand 48 towards

each other so that respective tips of the fingers 44 and 46 meet in one point 50. In the locked state, the recognition of said first eight gestures is omitted. In the unlocked state, the gesture recognition unit 18 is ready to recognize said first eight gestures.

The gesture recognition unit 18 is configured to be switched from the unlocked state into the locked state upon recognition of a tenth gesture illustrated in Fig. 3, the tenth gesture comprising a movement of the fingers 44 and 46 away from each other. As can be seen in Fig. 3, the tenth gesture is performed by opening the fingers 44 and 46 so that the finger tips are arranged at a distance from each other. In the present case, the finger 44 is the forefinger and the finger 46 is the thumb of the hand 48.

Moreover, upon recognition of the gestures respective sounds are played and/or the colour of the front surface 16 is changed thereby realizing an acoustical and optical feedback to the user. For example, in the locked state, the front surface 16 is grey as default colour and the gesture recognition unit 18 scans for input. Preferably, in the locked state, the gesture recognition unit 18 cannot recognize any gesture except for the ninth gesture. Thus, when the user performs the ninth gesture, i.e. moves the fingers 44 and 46 towards each other within the detection area 20, the gesture recognition unit 18 is switched from the locked state into the unlocked state. For example, when the user moves the fingers 44 and 46 into the detection area 20 and then the gesture recognition unit 18 detects the fingers 44 and 46 being arranged at a distance from each other, a short activation sound is played and the front surface 16 changes its colour from grey to green with a fast rotating colour effect. When the user moves the fingers 44 and 46 towards each other, i.e. performs the ninth gesture

and the gesture recognition unit 18 recognizes the ninth gesture, a short activation sound is played and the fast rotating colour effect is stopped so that the front surface 16 or its green colour is steady.

The gesture recognition unit 18 is kept in the unlocked state only as long as the fingers 44 and 46, in particular the finger tips are kept together within the detection area 20. Then, the user can perform said first eight gestures in order to effect the corresponding eight functions of the navigation system. For example, every time the gesture recognition unit 18 recognizes one of said first eight gestures, a corresponding adjusting sound is played in order to inform the user that the respective gesture was detected properly. When the user opens the fingers 44 and 46, i.e. performs the tenth gesture, the gesture recognition unit 18 is switched back from the unlocked state into the locked state, wherein the front surface 16 changes its colour from green back to static grey.

The navigation system is an operation device having a plurality of different functions. In the present case, the functions relate to adjusting the virtual map 12. Thus, the navigation system is a very complex system. However, this complex system can be operated by the user in a particularly easy and comfortable way by performing said gestures.

What is claimed is:

1. An operating device for a vehicle, the operating device comprising a gesture recognition unit (18) configured to recognize at least one gesture performed by a user of the vehicle, the operating device being configured to execute at least one function upon recognition of the gesture,

characterized in that

the gesture recognition unit (18) has at least one three-dimensional detection area (20), the operating device being configured to execute respective functions upon recognition of eight gestures performed within the detection area (20) by the user, wherein:

- a first one of the gestures comprises a translational movement of a hand (48) of the user along a first movement (22) axis into a first direction (24);
- a second one of the gestures comprises a translational movement of the hand (48) along the first movement (22) axis into a second direction (26) opposite to the first direction (24);
- a third one of the gestures comprises a translational movement of the hand (48) of the user along a second movement axis (28) into a third direction (30), the second movement axis (28) being perpendicular to the first movement axis (22);
- a fourth one of the gestures comprises a translational movement of the hand (48) along the second movement (28) axis into a fourth direction (32) opposite to the third direction (30);
- a fifth one of the gestures comprises a translational movement of the hand (48) along a third movement axis (34) into a fifth direction (36), the third movement axis (34) being perpendicular to the first

movement axis (22) and the second movement axis (28);

- a sixth one of the gestures comprises a translational movement of the hand (48) along the third movement axis (34) into a sixth direction (38) opposite to the fifth direction (36);

- a seventh one of the gestures comprises a rotational movement of the hand (48) about the third movement axis (34) into a first rotating direction (40); and

- an eighth one of the gestures comprises a rotational movement of the hand (48) about the third movement axis (34) into a second rotating direction (42) opposite to the first rotating direction (40).

2. The operating device according to claim 1,
characterized in that

the gesture recognition unit (18) is configured to be switched from a locked state into an unlocked state upon recognition of a ninth gesture performed within the detection area (20), the ninth gesture comprising a movement of two fingers (44, 46) of the hand (48) towards each other, wherein, in the locked state, the recognition of said eight gestures is omitted and, in the unlocked state, the gesture recognition unit (18) is ready to recognize said eight gestures

3. The operating device according to claim 2,
characterized in that

the gesture recognition unit (18) is configured to be switched from the unlocked state into the locked state upon recognition of a tenth gesture performed within the detection area (20), the tenth gesture comprising a movement of the fingers (44, 46) away from each other.

4. The operating device according to any one of claims 2 or 3,
characterized in that

the gesture recognition unit (18) is configured to be kept in the unlocked state as long as the fingers (44, 46) are kept together.

5. The operating device according to any one of the preceding claims, characterized in that
the operating device is configured as a navigation system for the vehicle.
6. The operating device according to claim 5, characterized in that
the navigation device comprises a display unit (10) configured to show a virtual map (12), the functions relating to adjusting the virtual map (12).
7. A vehicle, in particular a passenger vehicle, comprising an operation device according to any one of the preceding claims.
8. A method for operating an operating device for a vehicle, the operating device comprising a gesture recognition unit (18) by means of which at least one gesture performed by a user of the vehicle is recognized, wherein at least one function is executed by the operating device upon recognition of the gesture, characterized in that
the gesture recognition unit has at least one three-dimensional detection area, the operating device executing respective functions upon recognition of eight gestures performed within the detection area by the user, wherein:
 - a first one of the gestures comprises a translational movement of a hand (48) of the user along a first movement (22) axis into a first direction (24);
 - a second one of the gestures comprises a translational movement of

the hand (48) along the first movement (22) axis into a second direction (26) opposite to the first direction (24);

- a third one of the gestures comprises a translational movement of the hand (48) of the user along a second movement axis (28) into a third direction (30), the second movement axis (28) being perpendicular to the first movement axis (22);

- a fourth one of the gestures comprises a translational movement of the hand (48) along the second movement (28) axis into a fourth direction (32) opposite to the third direction (30);

- a fifth one of the gestures comprises a translational movement of the hand (48) along a third movement axis (34) into a fifth direction (36), the third movement axis (34) being perpendicular to the first movement axis (22) and the second movement axis (28);

- a sixth one of the gestures comprises a translational movement of the hand (48) along the third movement axis (34) into a sixth direction (38) opposite to the fifth direction (36);

- a seventh one of the gestures comprises a rotational movement of the hand (48) about the third movement axis (34) into a first rotating direction (40); and

- an eighth one of the gestures comprises a rotational movement of the hand (48) about the third movement axis (34) into a second rotating direction (42) opposite to the first rotating direction (40).

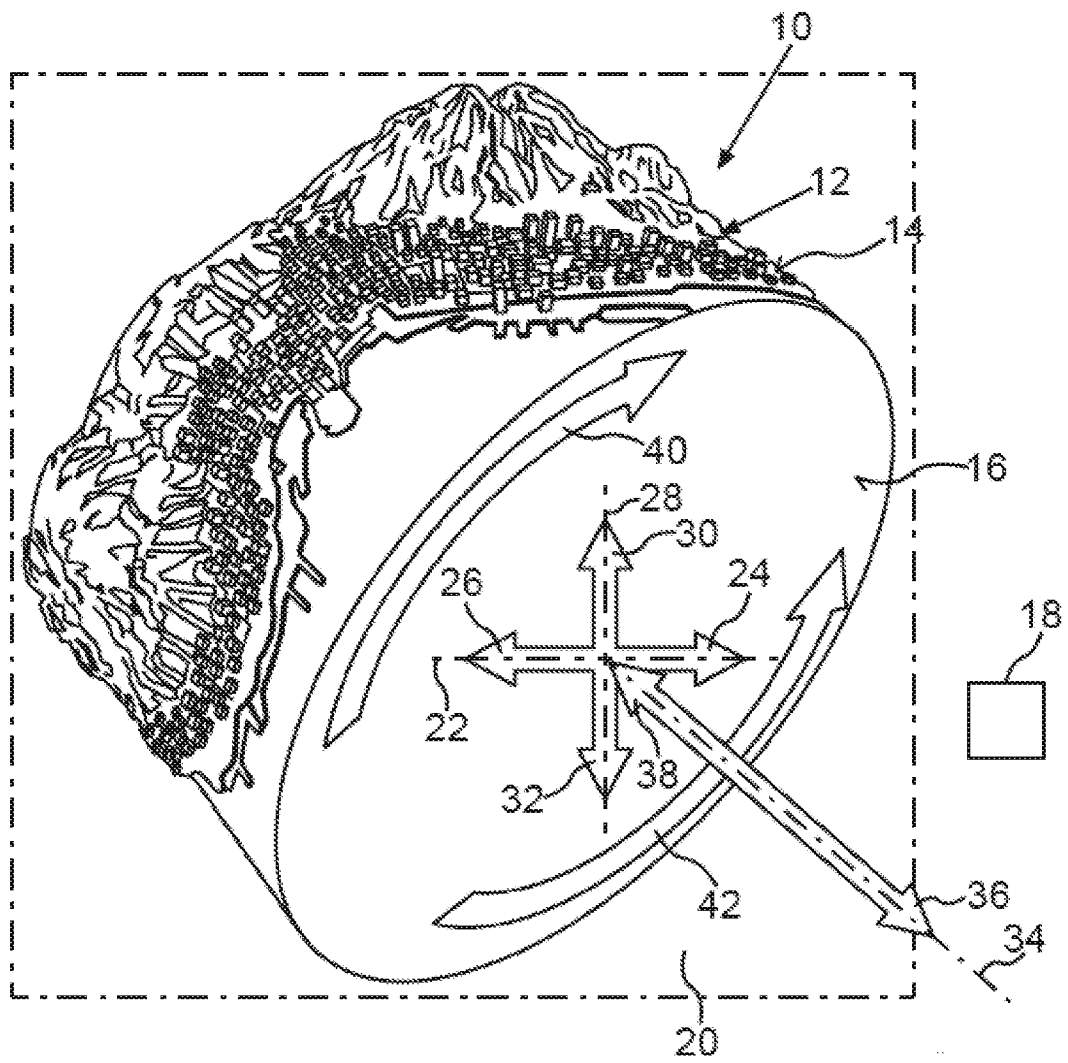


Fig. 1

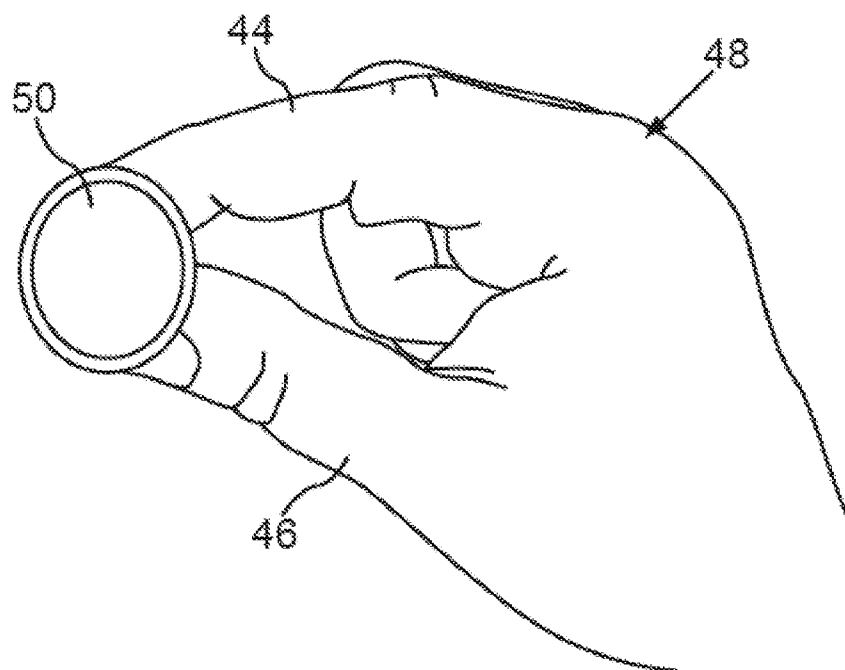


Fig. 2

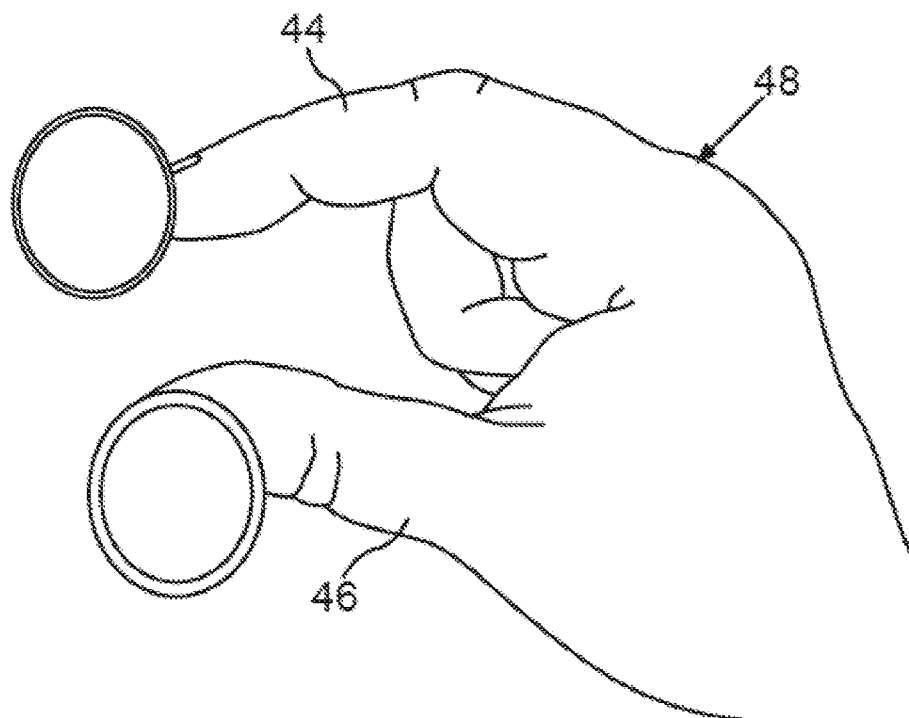


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2014/066621

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F3/01 G01C21/36
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06F G01C B60K

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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/267035 A1 (SCHALK THOMAS BARTON [US] ET AL) 18 September 2014 (2014-09-18)	1,5-8
Y	abstract; claim 5; figures 1-17 paragraphs [0019], [0020], [0056], [0095] - [0098], [0147], [0152]	2-4
X	DE 10 2012 219852 A1 (BOSCH GMBH ROBERT [DE]) 30 April 2014 (2014-04-30)	1,7,8
A	abstract; figures 1-8 paragraphs [0005], [0007], [0010], [0011], [0014], [0016], [0031], [0032], [0034], [0040] - [0047], [0051], [0053] - [0061]	2-4
X	US 2013/204457 A1 (KING ANTHONY GERALD [US] ET AL) 8 August 2013 (2013-08-08)	1,7,8
A	figures 1-5 paragraphs [0016] - [0018], [0021]	2-4
	-/-	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search

27 May 2015

Date of mailing of the international search report

05/06/2015

Name and mailing address of the ISA/

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Köhn, Andreas

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2014/066621

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2013/155237 A1 (PAEK TIMOTHY S [US] ET AL) 20 June 2013 (2013-06-20)	1,7,8
A	abstract; figures 1-28 paragraphs [0119] - [0123] -----	2-4
Y	US 2013/265229 A1 (FORUTANPOUR BABAK [US] ET AL) 10 October 2013 (2013-10-10)	2-4
	abstract; figures 1-7 paragraphs [0023], [0038], [0048] -----	
A	US 2003/151592 A1 (RITTER DIETER [DE]) 14 August 2003 (2003-08-14)	1,5-8
	abstract; figures 1-6 paragraphs [0015], [0036], [0047], [0048], [0054] - [0057], [0062], [0065] -----	
A	US 2013/169668 A1 (LYNCH JAMES D [US]) 4 July 2013 (2013-07-04)	6
	abstract; figures 1A-13 paragraphs [0002], [0032] -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2014/066621

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4, 7, 8

Invention 1 (claims 1-4, 7 and 8) directed towards a gesture-based operating device for a vehicle that can keep the risk of faulty operation particularly low, the operating device (essentially) comprising:

- (i) a gesture recognition unit having a three-dimensional detection area;
- (ii) the operating device being configured to execute respective functions upon recognition of eight gestures, the eight gestures being translational hand movements along respective orthogonal movement axes of a three-dimensional coordinate system, and a rotational hand movement about one of said movement axes; and wherein
- (iii) the gesture recognition unit is configured to switch from a locked state to an unlocked state and from the unlocked state to the locked state in response to a ninth and tenth gesture, respectively.

2. claims: 5, 6

Invention 2 (claims 5 and 6) directed towards a gesture-based operating device for a vehicle that allows a user to control navigation functions of the vehicle, the operating device (essentially) comprising:

- (i) a gesture recognition unit having a three-dimensional detection area;
- (ii) the operating device being configured to execute respective functions upon recognition of eight gestures, the eight gestures being translational hand movements along respective orthogonal movement axes of a three-dimensional coordinate system, and a rotational hand movement about one of said movement axes; and wherein
- (iv) the operating device is configured as a navigation system for the vehicle.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2014/066621

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