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DISPLAY CONTROL DEVICE, DISPLAY CONTROL METHOD AND DISPLAY CONTROL PROGRAM

Abstract

A display control device that includes: a memory; and a processor that is coupled to the memory, the processor being configured to in a case in which a contact with, or a movement adjacent to, any of a plurality of operating portions provided inside a vehicle cabin is detected, display information corresponding to that operating portion on a display portion inside the vehicle cabin, and, in a case in which a contact with, or a movement adjacent to, two or more of the operating portions is detected, arbitrate the displaying of information on the display portion.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION [0001] This application is a continuation of U.S. application Ser. No. 17/463,299, filed Aug. 31, 2021, which is based on and claims priority under 35 USC 119 from Japanese Patent Application No. 2020-154364 filed on Sep. 15, 2020, the disclosure each of which is incorporated by reference herein.

BACKGROUND
Technical Field
[0002] The present disclosure relates to a display control device, a display control method, and a display control system.
Related Art
[0003] Technology in which, in a case in which a plurality of steering switches are operated simultaneously, outputs are decided based on priority levels established in a table is disclosed in Japanese Unexamined Patent Application Laid-Open (JP-A) No. 2005-96519.
[0004] In a case in which it is detected that a finger has made contact with, or has been moved adjacent to a plurality switches at the same time, if information corresponding to each of those switches is displayed on a screen, then there is a possibility that a vehicle occupant will experience a sense of being overwhelmed by information, and may fail to correctly recognize the information on the display.
SUMMARY
[0005] An aspect of the disclosure is a display control device that includes a memory, and a processor that is coupled to the memory, the processor being configured to in a case in which a contact with, or a movement adjacent to, any of a plurality of operating portions provided inside a vehicle cabin is detected, display information corresponding to that operating portion on a display portion inside the vehicle cabin, and, in a case in which a contact with, or a movement adjacent to, two or more of the operating portions is detected, arbitrate the displaying of information on the display portion.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0006] Exemplary embodiments of the present disclosure will be described in detail based on the following figures, wherein:
[0007] FIG. **1** is a view as seen from a vehicle rearward side of a vehicle cabin front portion of a vehicle in which a display control device according to an exemplary embodiment has been applied;
[0008] FIG. **2** is an enlarged view of principal portions showing an enlargement of a portion of a steering wheel shown in FIG. **1**;
[0009] FIG. **3** is a block diagram showing a hardware structure of the display control device according to the exemplary embodiment;

[0010] FIG. **4** is a block diagram showing a function structure of the display control device according to the exemplary embodiment;
[0011] FIG. **5** is a view showing a display example of a display portion in the exemplary embodiment, and shows a first hierarchy of a left-side switch and a first hierarchy of a right-side switch;
[0012] FIG. **6**A is a view showing a display example of a head-up display in the exemplary embodiment, and shows a first hierarchy of a left-side switch;
[0013] FIG. **6**B is a view showing a display example of a head-up display in the exemplary embodiment, and shows a second hierarchy of a left-side switch;
[0014] FIG. **7**A is a view showing a display example of a head-up display in the exemplary embodiment, and shows a state in which a lower button of a left-side first tact switch is being touched;
[0015] FIG. **7**B is a view showing a display example of a head-up display in the exemplary embodiment, and shows a state in which a left-side fourth tact switch is being touched;
[0016] FIG. **8**A is a view showing a display example of a head-up display in the exemplary embodiment, and shows a state in which a right-side third tact switch is being touched;
[0017] FIG. **8**B is a view showing a display example of a head-up display in the exemplary embodiment, and shows a state in which the right-side third tact switch is being pressed, and a lower button of a right-side first tact switch is being touched;
[0018] FIG. **8**C is a view showing a display example of a head-up display in the exemplary embodiment, and shows a state in which the lower button of the right-side first tact switch is being pressed;
[0019] FIG. **9** is a state transition diagram illustrating display processing performed by the display control device according to the exemplary embodiment;
[0020] FIG. **10** is a flowchart illustrating display processing performed by the display control device according to the exemplary embodiment;
[0021] FIG. **11** is a view showing an example of an operation of a switch by a vehicle occupant; and
[0022] FIG. **12** is a view showing a variant example of layouts of a right-side switch and a left-side switch.

DETAILED DESCRIPTION

[0023] Hereinafter, an example of an exemplary embodiment of the present disclosure will be described with reference to the drawings. Note that the same reference symbols are used for component elements and portions that are the same or equivalent in the respective drawings. In addition, in some cases, dimensional proportions in the drawings have been exaggerated in order to simplify the description and may not reflect actual dimensions.
[0024] A display control device **10** according to an exemplary embodiment of the present disclosure will now be described with reference to the drawings. As is shown in FIG. **1**, an instrument panel **14** is installed in a vehicle cabin front portion of a vehicle **12** in which the display control device **10** of the present exemplary embodiment has been applied. In addition, windshield glass **16** is installed in a front end portion of the instrument panel **14**, and this windshield glass **16** extends in both a vehicle up-down direction and a vehicle left-right direction, and forms a boundary between the vehicle cabin interior and the vehicle cabin exterior.
[0025] A display screen **17**, which serves as a display portion, is set in the windshield glass **16**. The display screen **17** is a screen where images are projected from a head-up display **19** (see FIG. **3**) onto a portion of the area of the windshield glass **16**, and is set in an area of the windshield glass **16** that is located on the vehicle forward side of a driver's seat. Note that the display screen **17** that is serving as a display portion may instead be formed by a display of a car navigation system, or by a meter display.
[0026] A steering wheel **18** is provided via steering column (not shown in the drawings) on the

driver's seat-side (i.e., on the right side in the drawings) of the instrument panel **14**. The steering wheel **18** is provided with a substantially annular rim portion **18**A. In addition, a hub portion **18**B, which forms a central portion, is provided on an inner circumferential side of the rim portion **18**A, and the rim portion **18**A and hub portion **18**B are joined together by a plurality (three in the present exemplary embodiment) of spoke portions **18**C.

[0027] The spoke portions **18**C are provided in three locations, namely, between the right side of the rim portion **18**A and the hub portion **18**B, between the left side of the rim portion **18**A and the hub portion **18**B, and between the lower side of the rim portion **18**A and the hub portion **18**B. Here, a right-side switch group **20**R is provided on the spoke portion **18**C between the right side of the rim portion **18**A and the hub portion **18**B. In addition, a left-side switch group **20**L is provided on the spoke portion **18**C between the left side of the rim portion **18**A and the hub portion **18**B. The layouts of the right-side switch group **20**R and the left-side switch group **20**L are set such that respective switches are grouped together based on the functions that perform. The right-side switch group **20**R and the left-side switch group **20**L are described below in detail.

[0028] As is shown in FIG. **2**, a right-side first tact switch **40** is formed substantially in a circular shape, and is provided with operating portions in the form of an upper button **40**A, a lower button **40**B, a right button **40**C, and a left button **40**D. Because of this, the right-side first tact switch **40** is formed so as to be able to be pressed up and down and to the left and right. These buttons are principally used when driving support systems are being operated.

[0029] Note that the term ‘operation’ used here refers to actions such as, for example, pressing an operating portion, touching an operating portion, and moving a finger adjacent to an operating portion and the like. In addition, the term ‘vehicle on-board device’ used here refers not only to devices such as, for example, an air-conditioner, an audio device, a car navigation system, and a voice input device and the like, but also to driving support systems such as ACC (Active Cruise Control) and LTA (Lane Tracing Assist) and the like.

[0030] Moreover, a right-side first electrostatic sensor **41** is provided in the right-side first tact switch **40**, and a structure is employed in which it is possible to detect that a vehicle occupant has touched the right-side first tact switch **40**. More specifically, a structure is employed in which it is possible to detect which button out of the upper button **40**A, the lower button **40**B, the right button **40**C, and the left button **40**D on the right-side first tact switch **40** a vehicle occupant has touched. Note that, in a case in which the images (at least one of icons and/or text) displayed on the display screen **17** are switched, then different functions may be reallocated to the upper button **40**A, the lower button **40**B, the right button **40**C, and the left button **40**D.

[0031] A right-side second tact switch **42** is disposed on the lower-right side of the right-side first tact switch **40** when the steering wheel **18** is looked at from front-on. This right-side second tact switch **42** is formed in a substantially circular shape having a smaller diameter than the right-side first tact switch **40**. Moreover, in the present exemplary embodiment, the right-side second tact switch **42** is allocated the function of switching the images displayed on the display screen **17** upon being pressed. In other words, the hierarchy displayed on the display screen **17** is switched. In addition, a right-side second electrostatic sensor **43** is provided in the right-side second tact switch **42**, and a structure is employed in which it is possible to detect that a vehicle occupant has touched the right-side second tact switch **42**.

[0032] A right-side third tact switch **44** is disposed on the upper-left side of the right-side first tact switch **40** when the steering wheel **18** is looked at from front-on. This right-side third tact switch **44** is formed in a substantially rectangular shape having a cut-away lower-right corner. Moreover, in the present exemplary embodiment, the right-side third tact switch **44** is allocated the function of operating the ACC (Active Cruise Control) upon being pressed. In addition, a right-side third electrostatic sensor **45** is provided in the right-side third tact switch **44**, and a structure is employed in which it is possible to detect that a vehicle occupant has touched the right-side third tact switch **44**.

[0033] A right-side fourth tact switch **46** is disposed underneath the right-side third tact switch **44**. This right-side fourth tact switch **46** is formed in a substantially rectangular shape having a cut-away upper-right corner. Moreover, in the present exemplary embodiment, the right-side fourth tact switch **46** is allocated the function of operating the LTA (Lane Tracing Assist) upon being pressed. In addition, a right-side fourth electrostatic sensor **47** is provided in the right-side fourth tact switch **46**, and a structure is employed in which it is possible to detect that a vehicle occupant has touched the right-side fourth tact switch **46**.

[0034] In contrast, as is shown in FIG. **2**, the left-side switch group **20**L is provided with a left-side first tact switch **48**. The left-side switch group **20**L is provided with operating portions in the form of a left-side second tact switch **50**, a left-side third tact switch **52**, and a left-side fourth tact switch **54**, and each of these is formed by a contact detection-type switch. In addition, the left-side switch group **20**L is also provided with a left-side first electrostatic sensor **49**, a left-side second electrostatic sensor **51**, a left-side third electrostatic sensor **53**, and a left-side fourth electrostatic sensor **55**.

[0035] As is shown in FIG. **2**, the left-side first tact switch **48** is formed substantially in a circular shape, and is provided with operating portions in the form of an upper button **48**A, a lower button **48**B, a right button **48**C, and a left button **48**D. Because of this, the left-side first tact switch **48** is formed so as to be able to be pressed up and down and to the left and right.

[0036] Moreover, a left-side first electrostatic sensor **49** is provided in the left-side first tact switch **48**, and a structure is employed in which it is possible to detect that a vehicle occupant has touched the left-side first tact switch **48**. More specifically, a structure is employed in which it is possible to detect which button out of the upper button **48**A, the lower button **48**B, the right button **48**C, and the left button **48**D on the left-side first tact switch **48** a vehicle occupant has touched. Note that different operations are allocated to the upper button **40**A, the lower button **40**B, the right button **40**C, and the left button **40**D depending on the hierarchy that is displayed on the display screen **17**.

[0037] The left-side second tact switch **50** is disposed on the lower-left side of the left-side first tact switch **48** when the steering wheel **18** is looked at from front-on. This left-side second tact switch **50** is formed in a substantially circular shape having a smaller diameter than the left-side first tact switch **48**. Moreover, in the present exemplary embodiment, the left-side second tact switch **50** is allocated the function of altering the hierarchy of the images displayed on the display screen **17** upon being pressed. In addition, the left-side second electrostatic sensor **51** is provided in the left-side second tact switch **50**, and a structure is employed in which it is possible to detect that a vehicle occupant has touched the left-side second tact switch **50**.

[0038] The left-side third tact switch **52** is disposed on the upper-right side of the left-side first tact switch **48** when the steering wheel **18** is looked at from front-on. This left-side third tact switch **52** is formed in a substantially rectangular shape having a cut-away lower-left corner. Moreover, the left-side third tact switch **52** is allocated the function of turning up an audio volume upon being pressed. In addition, the left-side third electrostatic sensor **53** is provided in the left-side third tact switch **52**, and a structure is employed in which it is possible to detect that a vehicle occupant has touched the left-side third tact switch **52**.

[0039] The left-side fourth tact switch **54** is disposed underneath the left-side third tact switch **52**. This left-side fourth tact switch **54** is formed in a substantially rectangular shape having a cut-away upper-left corner. Moreover, the left-side fourth tact switch **54** is allocated the function of turning down an audio tone upon being pressed. In addition, the left-side fourth electrostatic sensor **55** is provided in the left-side fourth tact switch **54**, and a structure is employed in which it is possible to detect that a vehicle occupant has touched the left-side fourth tact switch **54**.

Hardware Structure

[0040] FIG. **3** is a block diagram showing a hardware structure of the display control device **10**. As is shown in FIG. **3**, the display control device **10** is provided with a control portion in the form of an ECU (Electrical Control Unit) **24**. The ECU **24** is formed so as to include a CPU (Central

Processing Unit; i.e., a hardware processor) **26**, ROM (Read Only Memory) **28**, RAM (Random Access Memory) **30**, storage **32**, a communication interface **34**, and an input/output interface **36**. These structures are mutually connected together so as to be able to communicate with each other via a bus **38**.

[0041] The CPU **26** is a central processing unit and performs tasks such as executing various types of programs and controlling the respective units. In other words, the CPU **26** loads a program from the ROM **28** or the storage **32**, and executes this program using the RAM **30** as a workspace. The CPU **26** controls the above-described respective structures and performs various types of calculation processing in accordance with programs recorded in the ROM **28** or the storage **32**.

[0042] The ROM **28** stores various types of programs and various types of data. The RAM **30** serves as a workspace and temporarily stores programs and data. The storage **32** is formed by an HDD (Hard Disk Drive) or an SSD (Solid State Drive), and stores various types of programs including operating systems, and various types of data.

[0043] The communication interface **34** is an interface that enables the ECU **24** to communicate with a server and other devices. A Standard such as, for example, Ethernet (Registered Trademark), FDDI, or Wi-Fi (Registered Trademark) is used for the communication interface **34**.

[0044] The HUD (Head-Up Display) **19**, the vehicle on-board devices **39**, the right-side switch group **20**R, and the left-side switch group **20**L are connected to the input/output interface **36**. More specifically, the input/output interface **36** is connected to the HUD **19** which projects images onto the display screen **17**, and the images from the HUD **19** are projected onto the display screen **17** as a result of a signal being received from the ECU **24**. Moreover, in addition to equipment such as the air-conditioner, audio devices, car navigation system, and voice input devices and the like, the vehicle on-board devices **39** also include driving support systems such as ACC (Active Cruise Control) and LTA (Lane Tracing Assist) and the like.

[0045] The right-side switch group **20**R is provided with the right-side first tact switch **40**. The right-side switch group **20**R is also provided with operating portions in the form of the right-side second tact switch **42**, the right-side third tact switch **44**, and the right-side fourth tact switch **46**, and each of these is formed by a contact detection-type switch. In addition, the right-side switch group **20**R is also provided with the right-side first electrostatic sensor **41**, the right-side second electrostatic sensor **43**, the right-side third electrostatic sensor **45**, and the right-side fourth electrostatic sensor **47**.

Function Structure

[0046] The display control device performs various types of functions by utilizing the hardware resources shown in FIG. **3**. The function structures realized by the display control device will now be described using FIG. **4**.

[0047] As is shown in FIG. **4**, the display control device **10** is formed so as to include, as function structures, a communication portion **80**, a detection portion **82**, a display control portion **84**, and an arbitration portion **86**. Each function structure is realized as a result of the ECU **24** reading, and then executing, a program stored in the ROM **28** or storage **32**.

[0048] The communication portion **80** performs communication with a server and with devices outside the vehicle through the communication interface **34**. The detection portion **82** detects either a contact with, or a movement adjacent to, one of the right-side switch group **20**R or the left-side switch group **20**L. As a result of this contact with, or movement adjacent to, one of the right-side switch group **20**R or the left-side switch group **20**L being detected, an input into the vehicle on-board device **39** that corresponds to this right-side switch group **20**R or the left-side switch group **20**L is detected. More specifically, in the right-side switch group **20**R, an input is detected as a result of a signal being received from the right-side first tact switch **40**, the right-side second tact switch **42**, the right-side third tact switch **44**, or the right-side fourth tact switch **46**. In the left-side switch group **20**L, an input is detected as a result of a signal being received from the left-side first tact switch **48**, the left-side second tact switch **50**, the left-side third tact switch **52**, or the left-side

fourth tact switch **54**.
[0049] The display control portion **84** causes information relating to the vehicle on-board device **39** that corresponds to whichever of the right-side switch group **20**R or left-side switch group **20**L has been pressed to be displayed on the display screen **17**. More specifically, the display control portion **84** provides visual notification to a vehicle occupant by causing information relating to the vehicle on-board device **39** to be displayed on the display screen **17** that is provided on the vehicle front side of the driver's seat. As is described below, the display control portion **84** causes the information relating to the vehicle on-board device **39** to be displayed on the display screen **17** by displaying a GUI (Graphical User Interface) that includes icons.
[0050] The arbitration portion **86** arbitrates the display of information on the display screen **17** by the display control unit **84** when the detection portion **82** detects a plurality of contacts with, or movements adjacent to, the right-side switch group **20**R or the left-side switch group **20**L.
[0051] In a case in which the detection portion **82** has detected a plurality of contacts with, or movements adjacent to, the right-side switch group **20**R or the left-side switch group **20**L, the arbitration portion **86** arbitrates the display of information on the display screen **17** by the display control portion **84** based on a first priority level that has been established for each switch of the right-side switch group **20**R and the left-side switch group **20**L. The first priority level is a priority level that is set, based on their functions, for each switch of the right-side switch group **20**R and the left-side switch group **20**L. The first priority level that is set for the right-side switch group **20**R which executes functions relating to a function group that supports the driving of the vehicle is set higher than the first priority level that is set for the left-side switch group **20**L which executes functions that do not relate to this function group.
[0052] In a case in which the detection portion **82** has detected a plurality of contacts with, or movements adjacent to, the right-side switch group **20**R or the left-side switch group **20**L and the first priority level established for each of the detected switches is the same, the arbitration portion **86** arbitrates the display of information on the display screen **17** by the display control portion **84** based on a second priority level. The second priority level is a priority level that is set, based on their layout positions, for each switch of the right-side switch group **20**R and the left-side switch group **20**L. When a vehicle occupant operates a plurality of switches of the right-side switch group **20**R and the left-side switch group **20**L, the second priority level may be set based on a positional relationship between the simultaneously operated switches of the right-side switch group **20**R and the left-side switch group **20**L. This positional relationship is a relationship that is based on the distance from a home position when the vehicle occupant operates the plurality of switches of the right-side switch group **20**R and the left-side switch group **20**L. The home position may be the position where a vehicle occupant grips the steering wheel **18**.
[0053] In a case in which the detection portion **82** has detected a plurality of contacts with, or movements adjacent to, the right-side switch group **20**R or the left-side switch group **20**L, the arbitration portion **86** may also arbitrate the display of information on the display screen **17** by the display control portion **84** based on the second priority level.
[0054] In a case in which the detection portion **82** has detected a plurality of contacts with, or movements adjacent to, the right-side switch group **20**R or the left-side switch group **20**L, the arbitration portion **86** may also perform arbitration so that the information corresponding to the switch having the highest detection value, as detected by the detection portion **82**, is displayed on the display screen **17**. The detection values detected by the detection portion **82** may be, for example, capacitance values output by the electrostatic sensor provided for each of the switches.
Description of the Display Information
[0055] Here, an example of the display information displayed on the display screen **17** of the present exemplary embodiment will be described with reference to FIG. **5** through FIG. **8**C. FIG. **5** shows images on a first hierarchy menu screen corresponding to the right-side switch group **20**R, and images on a first hierarchy menu screen corresponding to the left-side switch group **20**L.

[0056] A right-side first frame portion **62**, which corresponds to the right-side first tact switch **40**, is displayed on the right side of the display screen **17**. This right-side first frame portion **62** is formed so as include an upper circular-arc portion **62**A, a lower circular-arc portion **62**B, a right-side circular-arc portion **62**C, and a left-side circular-arc portion **62**D. The upper circular-arc portion **62**A, the lower circular-arc portion **62**B, the right-side circular-arc portion **62**C, and the left-side circular-arc portion **62**D correspond respectively to the upper button **40**A, the lower button **40**B, the right button **40**C, and the left button **40**D of the right-side first tact switch **40**.
[0057] Here, an icon M**1** is displayed adjacent to the upper circular-arc portion **62**A. This icon M**1** is formed so as to resemble a character string 'RES'. In other words, the icon M**1** corresponds to a function of RESUME. In addition, an icon M**2** is displayed adjacent to the lower circular-arc portion **62**B. This icon M**2** is formed so as to resemble a character string 'SET'. In other words, the icon M**2** corresponds to a function of SET.
[0058] An icon M**3** is displayed adjacent to the right circular-arc portion **62**C. This icon M**3** is formed so as to resemble a character string 'CANCEL'. In other words, the icon M**3** corresponds to a function of CANCEL. In addition, an icon M**4** is displayed adjacent to the left circular-arc portion **62**D. This icon M**4** is formed so as to resemble a vehicle and radar. In other words, the icon M**2** corresponds to a function of detecting information concerning the periphery of a vehicle.
[0059] A right-side second frame portion **64**, which corresponds to the right-side second tact switch **42**, is displayed on the lower right of the right-side first frame portion **62**, and an icon M**5** is displayed within this right-side second frame portion **64**. The icon M**5** resembles a shape of overlaid rectangles, and corresponds to a function of altering the hierarchy being displayed on the display screen **17**.
[0060] A right-side third frame portion **66**, which corresponds to the right-side third tact switch **44**, is displayed on the upper right of the right-side first frame portion **62**. An icon M**6** is displayed within this right-side third frame portion **66**. The icon M**6** is formed so as to resemble a vehicle and a meter, and corresponds to the ACC function.
[0061] A right-side fourth frame portion **68**, which corresponds to the right-side fourth tact switch **46**, is displayed on the lower left of the right-side first frame portion **62**. An icon M**7** is displayed within this right-side fourth frame portion **68**. The icon M**7** is formed so as to resemble a vehicle and a lane, and corresponds to an LTA function. These icons M**1**˜M**7** are icons of the first hierarchy of the display screen **17** corresponding to the right-side switch group **20**R.
[0062] In contrast, a left-side first frame portion **70**, which corresponds to the left-side first tact switch **48**, is displayed on the left side of the display screen **17**. This left-side first frame portion **70** is formed so as include an upper circular-arc portion **70**A, a lower circular-arc portion **70**B, a right-side circular-arc portion **70**C, and a left-side circular-arc portion **70**D. The upper circular-arc portion **70**A, the lower circular-arc portion **70**B, the right-side circular-arc portion **70**C, and the left-side circular-arc portion **70**D correspond respectively to the upper button **48**A, the lower button **48**B, the right button **48**C, and the left button **48**D of the left-side first tact switch **48**.
[0063] Here, an icon M**8** is displayed adjacent to the upper circular-arc portion **70**A. This icon M**8** is formed so as to resemble a telephone. In other words, the icon M**1** corresponds to a call function. In addition, an icon M**9** is displayed adjacent to the lower circular-arc portion **70**B. This icon M**9** is formed so as to resemble a state in which a vehicle occupant is talking. In other words, the icon M**9** corresponds to a voice recognition function.
[0064] An icon M**10** is displayed adjacent to the right circular-arc portion **70**C. This icon M**10** is formed so as to resemble a triangle. Namely, the icon M**10** corresponds to a 'play next song' function. In addition, an icon M**11** is displayed adjacent to the left circular-arc portion **70**D. This icon M**11** is formed as a left-right inversion of the icon M**10**. Namely, the icon M**11** corresponds to a 'play previous song' function.
[0065] A left-side second frame portion **72**, which corresponds to the left-side second tact switch **50**, is displayed on the lower left of the left-side first frame portion **70**, and an icon M**12** is

displayed within this left-side second frame portion **72**. The icon M**12** resembles a shape of overlaid rectangles, and corresponds to a function of altering the hierarchy.

[0066] A left-side third frame portion **74**, which corresponds to the left-side third tact switch **52**, is displayed on the upper right of the left-side first frame portion **70**. An icon M**13** is displayed within this left-side third frame portion **74**. The icon M**13** is formed so as to resemble a speaker, and corresponds to an 'increase volume' function.

[0067] A left-side fourth frame portion **76**, which corresponds to the left-side fourth tact switch **54**, is displayed on the lower right of the left-side first frame portion **70**. An icon M**14** is displayed within this left-side fourth frame portion **76**. The icon M**14** is formed so as to resemble a speaker, and corresponds to a 'decrease volume' function. These icons M**8**˜M**14** are icons of the first hierarchy of the display screen **17** corresponding to the left-side switch group **20**L.

[0068] Next, the first hierarchy of the display screen **17** corresponding to the left-side switch group **20**L is shown in FIG. **6**A. If, in this state, a vehicle occupant presses the left-side second tact switch **50** of the left-side switch group **20**L, the display screen **17** is switched to displaying the second hierarchy, which is shown in FIG. **6**B.

[0069] As is shown in FIG. **6**B, in the second hierarchy, an icon M**15** is displayed instead of the icon M**8**. The icon M**15** is formed so as to resemble a character string 'TEMP+', and corresponds to a function of turning up the air-conditioning temperature. In addition, an icon M**16** is displayed instead of the icon M**9**. The icon M**16** is formed so as to resemble a character string 'TEMP−', and corresponds to a function of turning down the air-conditioning temperature.

[0070] Furthermore, in the second hierarchy, an icon M**17** is displayed instead of the icon M**10**. The icon M**17** is formed so as to resemble a vehicle occupant and a blower direction, and corresponds to a function of altering the blower direction. In addition, an icon M**18** is displayed instead of the icon M**11**. The icon M**18** is formed so as to resemble a vehicle, and corresponds to a function of circulating air inside the vehicle. In this way, in the present exemplary embodiment, displays relating to air-conditioning are performed in the second hierarchy of the display screen **17** corresponding to the left-side switch group **20**L. Moreover, the detecting portion **82** is formed so as to detect a pressing or touching action on the left-side switch group **20**L as an input of an operation that corresponds to the hierarchy currently being displayed on the display screen **17**.

[0071] Next, FIG. **7**A shows the display on the display screen **17** when a vehicle occupant touches the lower button **48**B of the left-side first tact switch **48**. In other words, the first hierarchy of the display screen **17** corresponding to the left-side switch group **20**L is shown in FIG. **7**A. The lower circular-arc portion **70**B of the left-side first frame portion **70** can be seen displayed in an enhanced display. More specifically, the lower circular-arc portion **70**B of the left-side first frame portion **70** and the periphery of the lower circular-arc portion **70**B are displayed more brightly. In addition, an icon M**19** is displayed in an area on the right side of the left-side third frame portion **74** and the left-side fourth frame portion **76**. This icon M**19** is formed so as to resemble a character string 'TELEPHONE', which shows that this icon M**19** has a communication function. These displays are implemented via the functioning of the display control unit **84**, and a structure is employed in which contents that correspond to the lower button **48**B that is being touched by a vehicle occupant are displayed. The display control unit **84** also causes the position of the left-side first tact switch **48** that is being touched by the vehicle occupant to be displayed on the display screen **17**.

[0072] FIG. **7**B shows the display on the display screen **17** in a state in which a vehicle occupant is touching the left-side fourth tact switch **54**. As is shown in FIG. **7**B, the first hierarchy of the display screen **17** corresponding to the left-side switch group **20**L is displayed. The left-side fourth frame portion **76** is displayed in an enhanced display. More specifically, the left-side fourth frame portion **76** is displayed more brightly. In addition, an icon M**20** is displayed in an area on the right side of the left-side third frame portion **74** and the left-side fourth frame portion **76**. This icon M**20** is formed so as to resemble a character string 'VOL 25', which shows that the audio volume level is set to 25. These displays are implemented via the functioning of the display control unit **84**, and a

structure is employed in which contents that correspond to the left-side fourth tact switch **54** that is being touched by a vehicle occupant are displayed.

[0073] FIG. **8**A shows the display on the display screen **17** in a state in which a vehicle occupant is touching the right-side third tact switch **44**. As is shown in FIG. **8**A, icons for functions that are unable to be selected are hidden from display. In other words, the icons M**1**˜M**4** that have been allocated respectively to the upper circular-arc portion **62**A, the lower circular-arc portion **62**B, the right-side circular-arc portion **62**C, and the left-side circular-arc portion **62**D of the right-side first frame portion **62** are hidden from display by the functioning of the display control unit **84**. Moreover, the icon M**7** within the right-side third frame portion **66** is also hidden from display, while the right-side third frame portion **66** is displayed in enhancement. More specifically, the right-side third frame portion **66** is displayed more brightly.

[0074] In a case in which a vehicle occupant presses the right-side third tact switch **44** in the state shown in FIG. **8**A, the display transitions to the state shown in FIG. **8**B. In FIG. **8**B, the icon M**2** that has been allocated to the lower circular-arc portion **62**B of the right-side first frame portion **62** is displayed. Moreover, in FIG. **8**B, because a vehicle occupant is touching the lower button **40**B of the right-side first tact switch **40**, the lower circular-arc portion **62**B being displayed on the display screen **17** is displayed in enhancement. More specifically, the lower circular-arc portion **62**B and the periphery of the lower circular-arc portion **62**B are displayed more brightly.

[0075] In a case in which a vehicle occupant presses the lower button **40** of the right-side first tact switch **40** in the state shown in FIG. **8**B, the ACC operating state is implemented, and the display transitions to the state shown in FIG. **8**C. In FIG. **8**C, the icon M**3** that has been allocated to the right-side circular-arc portion **62**C of the right-side first frame portion **62** is displayed. In addition, an icon M**21** is displayed in the upper circular-arc portion **62**A, and an icon M**22** is displayed in the lower circular-arc portion **62**B. The icon M**21** is formed so as to resemble a character '+', while the icon M**22** is formed so as to resemble a character '−'. A structure is consequently created in which, in a case in which the upper button **40**A of the right-side first tact switch **40** is pressed, the set speed of the ACC is increased, while in a case in which the lower button **40**B of the right-side first tact switch **40** is pressed, the set speed of the ACC is decreased.

Examples of State Transitions

[0076] Next, the display processing performed by the display control device **10** will be described with reference to the state transition diagram shown in FIG. **9**. In the state transition diagram shown in FIG. **9**, in a case in which a numeral is shown at the base of an arrow, this numeral shows the priority level when transitioning from the same state.

[0077] In a state S**1** in which a vehicle occupant has operated neither the right-side switch group **20**R nor the left-side switch group **20**L, and no GUI is being displayed on the display screen **17**, if a vehicle occupant then operates the right-side switch group **20**R, the display control device **10** transitions to the display state S**2** of the operated right-side switch group **20**R. If, in this display state S**2**, the vehicle occupant does not then operate the right-side switch group **20**R, the display control device **10** transitions to the timeout standby state S**3**.

[0078] In the state S**1** in which a vehicle occupant has operated neither the right-side switch group **20**R nor the left-side switch group **20**L, and no GUI is being displayed on the display screen **17**, if a vehicle occupant then operates the left-side switch group **20**L, the display control device **10** transitions to the display state S**4** of the operated left-side switch group **20**L. If, in this display state S**4**, the vehicle occupant then operates the right-side switch group **20**R, the display control device **10** transitions to the display state S**2** of the operated right-side switch group **20**R. If, in the display state S**4**, the vehicle occupant does not operate the left-side switch group **20**L, the display control device **10** transitions to the timeout standby state S**5**.

[0079] In the state S**1** in which a vehicle occupant has operated neither the right-side switch group **20**R nor the left-side switch group **20**L, and no GUI is being displayed on the display screen **17**, it will be assumed that the vehicle occupant has operated the right-side switch group **20**R and the left-

side switch group **20**L. In this case, because the priority level of the transition to the display state S**2** is higher, the display control device **10** transitions to the display state S**2** of the operated right-side switch group **20**R.

[0080] In the timeout standby state S**3**, it will be assumed that the vehicle occupant has operated the right-side switch group **20**R and the left-side switch group **20**L at the same time. In this case, because the priority level of the transition to the display state S**2** is higher, the display control device **10** transitions to the display state S**2** of the operated right-side switch group **20**R. If the vehicle occupant only operates the left-side switch group **20**L, the display control device **10** transitions to the state S**4**. In the timeout standby state S**3**, if the vehicle occupant does not touch any switch for a predetermined length of time, the display control device **10** returns to the state S**1**.

[0081] In the timeout standby state S**5**, it will be assumed that the vehicle occupant has operated the right-side switch group **20**R and the left-side switch group **20**L at the same time. In this case, because the priority level of the transition to the display state S**2** is higher, the display control device **10** transitions to the display state S**2** of the operated right-side switch group **20**R. If the vehicle occupant only operates the left-side switch **20**L, the display control device **10** transitions to the state S**4**. In the timeout standby state S**5**, if the vehicle occupant does not touch any switch for a predetermined length of time, the display control device **10** returns to the state S**1**.

Example of Display Processing

[0082] Next, an example of a flow of display processing performed by the display control device **10** will be described with reference to the flowchart shown in FIG. **10**. This display processing is executed when, for example, an ignition switch (i.e., the power) of the vehicle **12** is turned ON, and is implemented as a result of the CPU **26** reading a program stored in the ROM **28** or the storage **32**, and then expanding and subsequently executing the program in the RAM **30**.

[0083] The CPU **26** determines whether or not a vehicle occupant has either made contact with, or brought their finger adjacent to, at least one of the right-side switch group **20**R or the left-side switch group **20**L (step S**101**). More specifically, in a case in which a signal has been received from the right-side first electrostatic sensor **41**, the right-side second electrostatic sensor **43**, the right-side third electrostatic sensor **45**, or the right-side fourth electrostatic sensor **47**, it is determined, as a result of a function performed by the detection portion **82**, that a vehicle occupant has touched the right-side switch group **20**R. In the same way, in a case in which a signal has been received from the left-side first electrostatic sensor **49**, the left-side second electrostatic sensor **51**, the left-side third electrostatic sensor **53**, or the left-side fourth electrostatic sensor **55**, it is determined that a vehicle occupant has touched the left-side switch group **20**L.

[0084] In step S**101**, if it is not detected that a vehicle occupant has either made contact with, or brought their finger adjacent to, at least one of the right-side switch group **20**R or the left-side switch group **20**L (S**101**: NO), then the CPU **26** ends the processing routine. If, however, in step S**101**, it is detected that a vehicle occupant has either made contact with, or brought their finger adjacent to, at least one of the right-side switch group **20**R or the left-side switch group **20**L (S**101**: YES), then the CPU **26** determines whether or not a plurality of contacts have been detected (step S**102**).

[0085] If, in step S**102**, a plurality of contacts have not been detected (S**102**: NO), the CPU **26** displays information for the detected switch on the display screen **17** (step S**103**). If, ever, in step S**103**, it is detected that a plurality of contacts have been detected (S**102**: YES), then the CPU **26** determines whether or not the first priority levels of the detected switches are the same (step S**104**).

[0086] If, in step S**104**, the first priority levels of the detected switches are not the same (step S**104**: NO), then the CPU **26** displays the information for the switch having the highest first priority level of the detected switches on the display screen **17** (step S**105**). If, on the other hand, the first priority levels of the detected switches are the same (step S**104**: YES), the CPU **26** determines whether or not the second priority levels of the detected switches are the same (step S**106**).

[0087] If, in step S**106**, the second priority levels of the detected switches are not the same (step

S**106**: NO), then the CPU **26** displays the information for the switch having the highest second priority level of the detected switches on the display screen **17** (step S**105**). If, on the other hand, the second priority levels of the detected switches are the same (step S**106**: YES), the CPU **26** displays the information for the switch having the highest detection value of the detected switches on the display screen **17** (step S**107**). The detection value is, for example, the capacitance of the electrostatic sensor.

[0088] As a result of the CPU **26** executing the operating sequence shown in FIG. **10**, when a plurality of switches are operated, it is possible to perform arbitration so that only a single set of information is displayed. When a plurality of switches are operated, as a result of the CPU **26** performing arbitration so that only a single set of information is displayed, it is possible to inhibit a vehicle occupant from feeling overwhelmed by the display of too much information, and to inhibit a display from being incorrectly recognized. cl Example of a Priority Level

[0089] FIG. **11** is a view showing an example of a switch group being operated by a vehicle occupant. A symbol Th represents a thumb of the vehicle occupant.

[0090] In the present exemplary embodiment, the first priority level set in the right-side switch group **20**R is set higher than the first priority level set in the left-side switch group **20**L. Accordingly, when a vehicle occupant operates both the right-side switch group **20**R and the left-side switch group **20**L at the same time, the right-side switch group **20**L is given precedence and the information thereof is displayed on the display screen **17**.

[0091] In addition, in the present exemplary embodiment, when a vehicle occupant operates a button, the second priority level is raised proportionally as the possibility that the thumb th will touch a plurality of buttons at the same time increases. In other words, the closer a switch is located to the tip of the thumb th of the vehicle occupant, the greater the priority level that is given to this switch. As a result, the display control device **10** is able to estimate which switch the vehicle occupant intended to operate.

[0092] In the present exemplary embodiment, in the right-side switch group **20**R, the second priority level of the right-side third tact switch **44** is set the highest, and thereafter the second priority level decreases in the sequence of the right-side fourth tact switch **46**, then the right-side second tact switch **42**, and then the right-side first tact switch **40**. In the same way, in the left-side switch group **20**L, the second priority level of the left-side third tact switch **53** is set the highest, and thereafter the second priority level decreases in the sequence of the left-side fourth tact switch **54**, then the left-side second tact switch **50**, and then the left-side first tact switch **48**.

[0093] In addition, the display control device **10** displays, on the display screen **17**, information for the switch having the highest detection value of the detected switches out of the right-side first tact switch **40**, in which a plurality of switches are provided, and the left-side first tact switch **48**.

Variant Examples of Switches

[0094] FIG. **12** shows a variant example of a layout of each switch of the right-side switch group **20**R and the left-side switch group **20**L. Even in a case in which the right-side switch group **20**R and the left-side switch group **20**L are arranged in a layout such as is shown in FIG. **12**, the first priority level set in the right-side switch group **20**R is set higher than the first priority level set in the left-side switch group **20**L. In addition, the second priority level of the respective switches are set in the same way as that described above.

[0095] In the present exemplary embodiment, the first priority level that is set in the right-side switch group **20**R is set higher than the first priority level set in the left-side switch group **20**L, however, it is also possible to make it possible for a vehicle occupant to select which of the right-side switch group **20**R and the left-side switch group **20**L is to have the higher first priority level.

[0096] Note that in the above-described exemplary embodiment, it is also possible for the display processing executed by the CPU after reading software (i.e., a program) to instead be executed by various types of processors other than a CPU. Examples of other types of processors in this case include PLD (Programmable Logic Devices) whose circuit structure can be altered after

manufacturing such as an FPGA (Field-Programmable Gate Array), and dedicated electrical circuits and the like which are processors having a circuit structure that is designed specifically in order to execute a particular processing such as ASIC (Application Specific Integrated Circuits). In addition, the display processing may be executed by just one type from among these various types of processors, or by a combination of two or more processors that are either the same type or are mutually different types (for example by a plurality of FPGA or by a combination of a CPU and an FPGA). Furthermore, the hardware structures of these different types of processors are, more specifically, electrical circuits obtained by combining circuit elements such as semiconductor elements and the like.

[0097] Moreover, in the above-described exemplary embodiment, a mode in which the display processing program is stored (i.e., installed) in advance in ROM or on storage is described, however, the present disclosure is not limited to this. It is also possible for the program to be provided in a mode in which it is recorded on a non-transitory recording medium such as a CD-ROM (Compact Disc Read Only Memory), a DVD-ROM (Digital Versatile Disc Read Only Memory), or a USB (Universal Serial Bus) memory. Moreover, it is also possible to enable each program to be downloaded from an external device via a network.

[0098] An exemplary embodiment of the present disclosure has been described above, however, the present disclosure is not limited to this. Various modifications and the like may be made to the present disclosure insofar as that do not depart from the spirit or scope of the present disclosure.

[0099] The present disclosure was conceived in view of the above-described problems, and it is an object thereof to provide a display control device, a display control method, and a display control system that, in a case in which it is detected that a finger has made contact with, or has been moved adjacent to a plurality switches at the same time, make it possible to inhibit a vehicle occupant from feeling overwhelmed by the display of too much information, and to inhibit a display from being incorrectly recognized.

[0100] A first aspect of the disclosure is a display control device that includes a memory, and a processor that is coupled to the memory, the processor being configured to in a case in which a contact with, or a movement adjacent to, any of a plurality of operating portions provided inside a vehicle cabin is detected, display information corresponding to that operating portion on a display portion inside the vehicle cabin, and, in a case in which a contact with, or a movement adjacent to, two or more of the operating portions is detected, arbitrate the displaying of information on the display portion.

[0101] According to the display control device of the first aspect, in a case in which it is detected that a finger has made contact with, or has been moved adjacent to a plurality switches at the same time, it is possible to inhibit a vehicle occupant from feeling overwhelmed by the display of too much information, and to inhibit a display from being incorrectly recognized.

[0102] A second aspect of the disclosure is the display control device of the first aspect, wherein the processor is configured to arbitrate to display information corresponding to an operating portion having a highest first priority level that has been set for each of the operating portions based on their function on the display portion.

[0103] A third aspect of the disclosure is the display control device of the second aspect, wherein the processor is configured to arbitrate, in a case in which the two or more of the operating portions for which a contact with, or a movement adjacent to, has been detected have a same first priority level, to display information corresponding to an operating portion having a highest second priority level that has been set for each of the operating portions based on their layout positions on the display portion.

[0104] A fourth aspect of the disclosure is the display control device of the second aspect, wherein a first priority level that is set for operating portions that execute functions relating to a function group that supports driving of a vehicle is set higher than a first priority level that is set for operating portions that execute functions that do not relate to the function group.

[0105] A fifth aspect of the disclosure is the display control device of the fourth aspect, wherein the operating portions that execute functions relating to the function group are provided on one side of a steering wheel that is provided on a vehicle front side of a driver's seat.
[0106] A sixth aspect of the disclosure is the display control device of the first aspect, wherein the processor is configured to arbitrate to display information corresponding to an operating portion having a highest second priority level that has been set for each of the operating portions based on their layout positions on the display portion.
[0107] A seventh aspect of the disclosure is the display control device of the sixth aspect, when a vehicle occupant operates the plurality of operating portions, the second priority level is set based on a positional relationship between simultaneously operated operating portions.
[0108] An eighth aspect of the disclosure is the display control device of the seventh aspect, wherein the positional relationship is a relationship that is based on a distance from a home position when the vehicle occupant operates the plurality of operating portions.
[0109] A ninth aspect of the disclosure is the display control device of the third aspect, wherein the processor is configured to arbitrate, in a case in which the two or more of the operating portions for which a contact with, or a movement adjacent to, has been detected have a same second priority level, to display information corresponding to an operating portion having a highest detection value is displayed on the display portion.
[0110] A tenth aspect of the disclosure is the display control device of the first aspect, wherein layouts of the operating portions are set such that the operating portions are grouped together based on functions that perform.
[0111] An eleventh aspect of the disclosure is the display control device of the first aspect, wherein the processor is configured to, after starting to display the information on the display portion, continue to display the information on the display portion for a predetermined time.
[0112] A twelfth aspect of the disclosure is the display control device of the eleventh aspect, wherein the processor is configured to, in a case in which a contact with, or a movement adjacent to, the operating portion is detected while the information is being displayed on the display portion, switch the display on the display portion to information that corresponds to this new detection.
[0113] A thirteenth aspect of the disclosure is the display control device of the first aspect, wherein the plurality of operating portions are provided at a steering wheel that is disposed on a vehicle front side of a driver's seat.
[0114] A fourteenth aspect of the disclosure is the display control device of the first aspect, wherein the processor is configured to display on the display portion at least one of icons or text that represent vehicle on-board devices that have been allocated to the operating portions.
[0115] A fifteenth aspect of the disclosure is the display control device of the first aspect, wherein the display portion is at least any one of a head-up display, a meter, or a car navigation system.
[0116] A sixteenth aspect of the disclosure is a display control method that includes, by a processor, in a case in which a contact with, or a movement adjacent to, any of a plurality of operating portions provided inside a vehicle cabin is detected, displaying information corresponding to that operating portion on a display portion inside the vehicle cabin; and, in a case in which a contact with, or a movement adjacent to, two or more of the operating portions is detected, arbitrating the displaying of information on the display portion.
[0117] A seventeenth aspect of the disclosure is the display control system that includes a display device that includes a display portion, and a display control device that includes a memory, and a processor that is coupled to the memory, the processor being configured to, in a case in which a contact with, or a movement adjacent to, any of a plurality of operating portions provided inside a vehicle cabin is detected, display information corresponding to that operating portion on a display portion inside the vehicle cabin, and, in a case in which a contact with, or a movement adjacent to, two or more of the operating portions is detected, arbitrate the displaying of information on the display portion.

[0118] According to the present disclosure, it is possible to provide a display control device, a display control method, and a display control system that, in a case in which it is detected that a finger has made contact with, or has been moved adjacent to a plurality switches at the same time, make it possible to inhibit a vehicle occupant from feeling overwhelmed by the display of too much information, and to inhibit a display from being incorrectly recognized.

Claims

1. A display control device comprising: a memory; and a processor that is coupled to the memory, the processor being configured to: where there are a plurality of switches having different functions disposed on a steering wheel inside a vehicle cabin, each separated from the other and each with a plurality of operating portions, display information corresponding to the operating portion of each of the plurality of switches for which a contact with, or a movement adjacent to has been detected, on a display inside the vehicle cabin, and responsive to detection of a contact with, or a movement adjacent to, two or more operating portions, perform an arbitration to display information on the display corresponding to only one of the two or more operating portions, wherein the arbitration is determined: firstly, upon a highest first priority level that has been set for each operating portion of the plurality of switches based on a respective function of the each operating portion; and secondly, upon a highest second priority level that has been set for each operating portion based on a respective layout position of the each operating portion, when the two or more of the plurality of operating portions, for which a contact with, or a movement adjacent to, has been detected, have a same first priority level.
2. The display control device according to claim 1, wherein the first priority level that is set for operating portions that execute functions relating to a function group that supports driving of a vehicle is higher than the first priority level for operating portions that execute functions that do not relate to the function group.
3. The display control device according to claim 2, wherein the operating portions that execute functions relating to the function group are on one side of a steering wheel that is on a vehicle front side of a driver's seat.
4. The display control device according to claim 1, wherein a vehicle occupant operates the plurality of operating portions, the second priority level is set based on a positional relationship between simultaneously operated operating portions.
5. The display control device according to claim 4, wherein the positional relationship is based on a distance from a home position.
6. The display control device according to claim 1, wherein the two or more of the operating portions for which a contact with, or a movement adjacent to, has been detected have a same second priority level, and information corresponding to an operating portion having a highest detection value is displayed on the display.
7. The display control device according to claim 1, wherein layouts of the operating portions are set such that the operating portions are grouped together based on functions that are performed.
8. The display control device according to claim 1, wherein the processor is configured to, after starting to display the information on the display, continue to display the information on the display for a predetermined time.
9. The display control device according to claim 8, wherein the processor is configured to, responsive to a new detection of a contact with, or a movement adjacent to, the operating portion while the information is being displayed on the display, switch the display to information that corresponds to the new detection.
10. The display control device according to claim 1, wherein the plurality of operating portions are at a steering wheel that is on a vehicle front side of a driver's seat.
11. The display control device according to claim 1, wherein the processor is configured to display

on the display at least one of icons or text that represent vehicle on-board devices that have been allocated to the operating portions.

12. The display control device according to claim 1, wherein the display is at least one of a head-up display, a meter, or a car navigation system.

13. The display control device according to claim 1, wherein the plurality of operating portions are not elements of the display.

14. A display control method comprising, by a processor: where there are a plurality of switches having different functions disposed on a steering wheel inside a vehicle cabin, each separated from the other and each with a plurality of operating portions, display information corresponding to the operating portion of each of the plurality of switches for which a contact with, or a movement adjacent to has been detected, on a display inside the vehicle cabin, and responsive to detection of a contact with, or a movement adjacent to, two or more operating portions, perform an arbitration to display information on the display corresponding to only one of the two or more operating portions, wherein the arbitration is determined: firstly, upon a highest first priority level that has been set for each operating portion of the plurality of switches based on a respective function of the each operating portion; and secondly, upon a highest second priority level that has been set for each operating portion based on a respective layout position of the each operating portion, when the two or more of the plurality of operating portions, for which a contact with, or a movement adjacent to, has been detected, have a same first priority level.

15. The display control method according to claim 13, wherein the plurality of operating portions are not elements of the display.

16. A display control system comprising: a display inside a vehicle cabin; and a display control that includes: a memory; and a processor that is coupled to the memory, the processor being configured to: where there are a plurality of switches having different functions disposed on a steering wheel inside a vehicle cabin, each separated from the other and each with a plurality of operating portions, display information corresponding to the operating portion of each of the plurality of switches for which a contact with, or a movement adjacent to has been detected, on a display inside the vehicle cabin, and responsive to detection of a contact with, or a movement adjacent to, two or more operating portions, perform an arbitration to display information on the display corresponding to only one of the two or more operating portions, wherein the arbitration is determined: firstly, upon a highest first priority level that has been set for each operating portion of the plurality of switches based on a respective function of the each operating portion; and secondly, upon a highest second priority level that has been set for each operating portion based on a respective layout position of the each operating portion, when the two or more of the plurality of operating portions, for which a contact with, or a movement adjacent to, has been detected, have a same first priority level.

17. The display control system according to claim 16, wherein the plurality of operating portions are not elements of the display.