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(54) Title: A SYSTEM AND METHOD FOR INDICATING PRESENCE OF CHILD IN A VEHICLE

(57) Abstract: The present disclosure relates to system for indicating presence of child occupant in vehicle. System comprises of at least one display unit (105) adapted to be disposed on at least one of windshield of vehicle and window of vehicle. System comprises of first sensor (101) configured to detect first status of child restraining assembly (201) fastened to vehicle seat (203). System comprises of second sensor (102) configured to detect second status of belt assembly of child restraining assembly (201). System comprises of control unit (103) communicably coupled to first sensor (101), second sensor (102) and at least one display unit (105). The control unit (103) is configured to detect presence of child occupant within child restraining assembly (201) based on first status and second status. Control unit (103) is configured to display notification based on presence of child occupant.

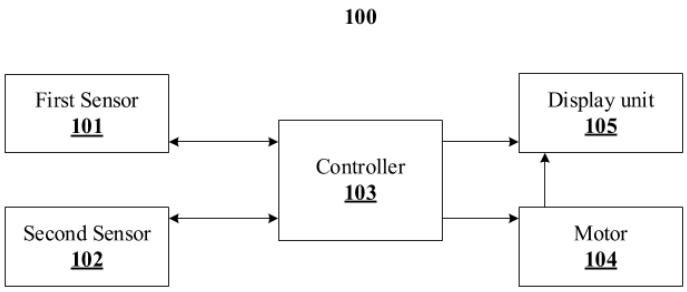

Fig. 1

FORM 2

THE PATENTS ACT 1970
(39 OF 1970)
&
The Patent Rules, 2003

Complete Specification
(See Section 10 and Rule 13)

1. TITLE OF THE INVENTION

A SYSTEM AND METHOD FOR INDICATING PRESENCE OF CHILD IN A VEHICLE

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3. PREAMBLE TO THE DESCRIPTION

COMPLETE

The following specification particularly describes the invention and the manner in which it is to be performed

TECHNICAL FIELD

[0001] The present subject matter is related in general to child safety seats in automobiles, more particularly, but not exclusively, the present subject matter relates to a method and system for indicating presence of child in a vehicle.

BACKGROUND

[0002] In the current automotive field, various measures are taken to ensure safety of occupants and especially safety towards children. Currently, manual stickers or indicators are used to indicate the presence of a child occupant in a vehicle. Such indications ensures responsible driving on the road. However, the use of such manual stickers or indicators pose several problems as their adhering mechanism are not durable and such manual stickers or indicators are not visible to other motorists or drivers during night time. Therefore, in such a scenario other motorists and drivers may not be able to exercise proper precaution while driving in the vicinity of a vehicle with a child occupant.

[0003] Information disclosed in this background of the disclosure section is only for enhancement of understanding of the general background of the invention and should not be taken as an acknowledgement or any form of suggestion that this information forms the prior art already known to a person skilled in the art.

SUMMARY

[0004] In an embodiment, the present disclosure relates to a system for indicating presence of child in a vehicle. The system comprises of at least one display unit adapted to be disposed on at least one of a windshield of a vehicle and a window of the vehicle. The system comprises of a first sensor configured to detect a first status of a child restraining assembly fastened to a vehicle seat. The system comprises of a second sensor configured to detect a second status of a belt assembly of the child restraining assembly. The system comprises of a control unit communicably coupled to the first sensor, the second sensor and the at least one display unit. The control unit is configured to detect a presence of a child occupant within the child restraining assembly based on the first status and the second status. The control unit is configured to display a notification based on the presence of the child occupant.

[0005] In another embodiment, the present disclosure relates to a method for indicating presence of child in a vehicle, comprising receiving by a control unit, a first status of a child restraining assembly to a vehicle seat from a first sensor as an engaged status and a second status of a belt assembly associated with the child restraining assembly from a second sensor as a fastened status. The method further comprises of detecting by the control unit, a presence of a child occupant within the child restraining assembly based on the first status and the second status. The method further comprises of displaying, by the control unit, a notification on at least one display unit.

[0006] The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0007] The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate exemplary embodiments and, together with the description, serve to explain the disclosed principles. In the figures, the left-most digit(s) of a reference number identifies the figure in which the reference number first appears. The same numbers are used throughout the figures to reference features and components. Some embodiments of system and/or methods in accordance with embodiments of the present subject matter are now described, by way of example only, and regarding the accompanying figures, in which:

[0008] Fig. 1 illustrates an environment of a system for indicating presence of child in a vehicle, in accordance with some embodiments of the present disclosure;

[0009] Fig. 2a discloses a sideview of an environment in which a child restraining assembly is fastened to a vehicle seat in an ISOFIX configuration, in accordance with some embodiments of the present disclosure;

[0010] Fig. 2b discloses an enlarged view of the latch and the anchorage, in accordance with some embodiments of the present disclosure;

[0011] Fig. 3a discloses a sideview of an environment in which a child restraining assembly is fastened to a vehicle seat in an Lower Anchor and Tether for CHildren (LATCH) configuration, in accordance with some embodiments of the present disclosure;

[0012] Fig. 3b discloses an enlarged view of the first sensor, anchor and the anchorage point, in accordance with some embodiments of the present disclosure;

[0013] Fig. 4a discloses an environment to illustrate the working if the first sensor, in accordance with some embodiments of the present disclosure;

[0014] Fig 4b discloses an environment 401 to illustrate the working if the first sensor, in accordance with some embodiments of the present disclosure;

[0015] Fig. 5a discloses a frontal view of the child restraining assembly, in accordance with some embodiments of the present disclosure;

[0016] Fig. 5b discloses an enlarged view of the latch plate, the first clasp and the second clasp, in accordance with some embodiments of the present disclosure;

[0017] Fig. 5c discloses an enlarged view of the latch plate, the first clasp and the second clasp, in accordance with some embodiments of the present disclosure;

[0018] Fig. 6a illustrates a top view of the vehicle, in accordance with some embodiments of the present disclosure;

[0019] Fig. 6b illustrates a rear view of the vehicle, in accordance with some embodiments of the present disclosure;

[0020] Fig. 7a discloses a first configuration of a motor, in accordance with some embodiments of the present disclosure;

[0021] Fig. 7b discloses a second configuration of a motor, in accordance with some embodiments of the present disclosure;

[0022] Fig. 8 discloses an exemplary method 800 for indicating presence of child in a vehicle, in accordance with some embodiments of the present disclosure;

[0023] It should be appreciated by those skilled in the art that any block diagrams herein represent conceptual views of illustrative systems embodying the principles of the present subject matter. Similarly, it will be appreciated that any flow charts, flow diagrams, state transition diagrams, pseudo code, and the like represent various processes which may be substantially represented in computer readable medium and executed by a computer or processor, whether such computer or processor is explicitly shown.

DETAILED DESCRIPTION

[0024] In the present document, the word "exemplary" is used herein to mean "serving as an example, instance, or illustration." Any embodiment or implementation of the present subject matter described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over other embodiments.

[0025] While the disclosure is susceptible to various modifications and alternative forms, specific embodiment thereof has been shown by way of example in the drawings and will be described in detail below. It should be understood, however that it is not intended to limit the disclosure to the particular forms disclosed, but on the contrary, the disclosure is to cover all modifications, equivalents, and alternative falling within the spirit and the scope of the disclosure.

[0026] The terms "comprises", "comprising", or any other variations thereof, are intended to cover a non-exclusive inclusion, such that a setup, device or method that comprises a list of components or steps does not include only those components or steps but may include other components or steps not expressly listed or inherent to such setup or device or method. In other words, one or more elements in a device or system or apparatus proceeded by "comprises… a" does not, without more constraints, preclude the existence of other elements or additional elements in the device or system or apparatus.

[0027] The terms “includes”, “including”, or any other variations thereof, are intended to cover a non-exclusive inclusion, such that a setup, device, or method that includes a list of components or steps does not include only those components or steps but may include other components or steps not expressly listed or inherent to such setup or device or method. In other words, one or more elements in a system or apparatus proceeded by “includes… a” does not, without more constraints, preclude the existence of other elements or additional elements in the system or method.

[0028] The terms "an embodiment", "embodiment", "embodiments", "the embodiment", "the embodiments", "one or more embodiments", "some embodiments", and "one embodiment" mean "one or more (but not all) embodiments of the invention(s)" unless expressly specified otherwise.

[0029] The terms "including", "comprising", “having” and variations thereof mean "including but not limited to", unless expressly specified otherwise.

[0030] As used herein, the terms “communication” and “communicate” may refer to the reception, receipt, transmission, transfer, provision, and/or the like of information (e.g., data, signals, messages, instructions, commands, and/or the like). For one unit (e.g., a device, a system, a component of a device or system, combinations thereof, and/or the like) to be in communication with another unit means that the one unit is able to directly or indirectly receive information from and/or transmit information to the other unit. This may refer to a direct or indirect connection (e.g., a direct communication connection, an indirect communication connection, and/or the like) that is wired and/or wireless in nature. Additionally, two units may be in communication with each other even though the information transmitted may be modified, processed, relayed, and/or routed between the first and second unit. For example, a first unit may be in communication with a second unit even though the first unit passively receives information and does not actively transmit information to the second unit. As another example, a first unit may be in communication with a second unit if at least one intermediary unit (e.g., a third unit located between the first unit and the second unit) processes information received from the first unit and communicates the processed information to the second unit. In some non-limiting embodiments, a message may refer to a network packet (e.g., a data packet

and/or the like) that includes data. It will be appreciated that numerous other arrangements are possible.

[0031] In the following detailed description of the embodiments of the disclosure, reference is made to the accompanying drawings that form a part hereof, and in which are shown by way of illustration specific embodiments in which the disclosure may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the disclosure, and it is to be understood that other embodiments may be utilized and that changes may be made without departing from the scope of the present disclosure. The following description is, therefore, not to be taken in a limiting sense.

[0032] Fig. 1 illustrates an environment 100 of a system for indicating presence of child in a vehicle. The environment 100 may comprise a first sensor 101, a second sensor 102, a control unit 103, a motor 104 and a display unit 105.

[0033] The first sensor 101 may be one of, without limitation to, an inductive proximity sensor, a capacitive proximity sensor, magnetic proximity sensor or ultrasonic proximity sensor and may be configured to detect a first status of a child restraining assembly (shown in Fig. 2) fastened to a vehicle seat. The first status is one of an engaged status or a disengaged status.

[0034] In an embodiment, when the first sensor 101 is an inductive proximity sensor, the first sensor 101 may be configured to detect the first status both in a contact and non-contact condition based on proximity detection. In such a scenario, the sensing range maybe between 0-60 millimetre (mm) and the sensor may be configured to detect materials such as, without limitation to, iron, steel, aluminium, copper and brass.

[0035] In an embodiment, when the first sensor 101 is a capacitive proximity sensor, the first sensor 101 may be configured to detect the first status both in a contact and non-contact condition based on proximity detection. In such a scenario, the sensing range maybe between 0-40 mm and the sensor may be configured to detect materials such as, without limitation to, iron, steel, aluminium, copper, brass, wood, granulates, plastic and glass.

[0036] The second sensor 102 may be one of, without limitation to, a reed sensor or a vane sensor and may be configured to detect a second status of a belt assembly of the child restraining assembly. The second status is one of a fastened status or an unfastened status.

[0037] The first sensor 101 and the second sensor 102 may be in communication with the control unit 103. The Control unit 103 may configured to detect a presence of a child occupant within the child restraining assembly based on the first status and the second status, when the first status is engaged status and the second status is fastened status. The Control unit 103 may not detect the presence of the child occupant within the child restraining assembly based on the first status and the second status, if the first status is engaged status and the second status is unfastened status, or if the first status is disengaged status and the second status is fastened status or if the first status is disengaged status and the second status is unfastened status.

[0038] In an embodiment, the control unit 103 may be one of, without limitation to, a relay unit, an Arduino controller, a Raspberry Pi controller, an ESP8266 controller, an ESP32 controller, a teensy controller, an AVR microcontroller, an MCS-51 microcontroller, a Peripheral Interface Controller (PIC), an Advanced RISC Machine (ARM) microcontroller, an MSP430 microcontroller, a PIC16F877A microcontroller and a RENESAS microcontroller.

[0039] In an embodiment, the motor 104 may be mechanically connected to the at display unit 105. In an embodiment, the motor 104, may be one of, without limitation to, a stepper motor, a servo motor, a brushless DC motor or a liner motor. The motor 104 may be configured to adapt a position of the display unit 105 from a first position of non-visibility (while viewing the display unit 105 from outside the vehicle) to a second position of visibility (while viewing the display unit 105 from outside the vehicle).

[0040] In an embodiment, the display unit 105 may be positioned in a portion of the windshield outside a field of view of a driver viewed from a rear view mirror of the vehicle when the windshield is a rear windshield. In an embodiment, the display unit 105 may be one of, without limitation to, a Liquid Crystal Display (LCD), Organic Light Emitting Diode (OLED) display, Light Emitting Diode (LED) display, MicroLED display, plasma Display, In-Plane Switching (**IPS**) **LCD** display, a Thin Film Transistor (TFT) LCD display, an Quantum LED (QLED) display.

[0041] Upon detection of the presence of the child occupant, the control unit 103 may be configured to display a notification on the display unit 105 indicating the presence of the child occupant within the vehicle. The notification may be a message such as, without limitation to, “child on board” or may be a pictorial representation of a child to indicate the presence if a child occupant or a combination thereof.

[0042] Upon detection of the presence of the child occupant, the control unit 103 may be configured to control the motor 104 to adapt a position of the display unit 105 from a first position of non-visibility (while viewing the display unit 105 from outside the vehicle) to a second position of visibility (while viewing the display unit 105 from outside the vehicle).

[0043] In an embodiment, a Switched Mode Power Supply (SMPS) may be used to power the one or more components of the system for indicating presence of a child in the vehicle.

[0044] In an embodiment, the child restraining assembly 201 may be engaged to the vehicle seat 203 by one of: an International Standard Organisation FIX (ISOFIX) assembly or a Lower Anchors and Tethers for Children (LATCH) assembly.

[0045] Fig. 2a discloses a sideview of an environment 200 in which a child restraining assembly 201 is fastened to a vehicle seat 203. In some embodiments, the child restraining assembly 201 is fastened to a vehicle seat 203 in an ISOFIX configuration. The child restraining assembly 201 comprises of a base 211 comprising a latch 209. The latch 209 may be adapted for disengage-able attachment of the child restraining assembly 201 to an anchorage 217 provided in the vehicle. In an embodiment, the latch 209 may be an ISOFIX latch and the anchorage 217 may an ISOFIX anchorage. The first sensor 101 may be placed at the anchorage 217 and may be configured to detect the first status of the child restraining assembly 201. In an embodiment, the child restraining assembly 201 may be in a disengaged status and may be provisioned to slide 107 onto the anchorage 217. The first sensor 101 may detect the first status as the disengaged status before the base 211 of the child restraining assembly 201 engages with the anchorage 217. The first sensor 101 may detect the first status as the engaged status after the base 211 of the child restraining assembly 201 engages with the anchorage 217.

[0046] Fig. 2b discloses an enlarged view of the latch 209 and the anchorage 217. The latch 209 may be configured to slide 207 onto the anchorage 217.

[0047] Fig. 3a, discloses a sideview of an environment 200 in which a child restraining assembly 201 is fastened to a vehicle seat 203 in an Lower Anchor and Tether for CHildren (LATCH) configuration. The LATCH configuration may include two lower anchors 303 (of which only one is illustrated), positioned between the child restraining assembly 201 and the vehicle seat 203 and an upper anchor 301 located behind the vehicle seat 203. The lower anchor 303 may be engaged to an anchorage point 305 of the vehicle. A first sensor 101 may be placed at the anchorage point 305 and may be configured to detect the first status of the child restraining assembly 201. The first sensor 101 may detect the first status as the disengaged status before the lower anchor 303 of the child restraining assembly 201 engages with the anchorage point 305. The first sensor 101 may detect the first status as the engaged status after the lower anchor 303 of the child restraining assembly 201 engages with the anchorage point 305.

[0048] In another embodiment, a third sensor 101a may be placed at the anchorage of the upper anchor 301 and a fourth sensor may be placed another lower anchor (not illustrated in fig. 3a). The Control unit 103 may detect the first status as engaged status when the first sensor 101, the third sensor 101a and the fourth sensor if their respective anchors are in an engaged position with their respective anchorage points.

[0049] Fig. 3b discloses an enlarged view of the first sensor 101, the lower anchor 303 and the anchorage point 305. The lower anchor 303 may be configured to engage with the anchorage point 305.

[0050] Fig. 4a and Fig 4b disclose an environment 401 to illustrate the working of the first sensor 101.

[0051] In an embodiment, when the first sensor 101 is an inductive proximity sensor. The first sensor 101 emits an electromagnetic field. When the latch 209 engages with the anchorage 217 (as illustrated in Fig. 4b), the electromagnetic field emitted by the first sensor 101 is disrupted. This disruption in the electromagnetic field is detected as the engaged status of the child restraining assembly 201.

[0052] In another embodiment, when the first sensor 101 is a capacitive proximity sensor. The first sensor 101 emits an electrostatic field. When the latch 209 engages with the anchorage 217 (as illustrated in Fig. 4b), the electrostatic field emitted by the first sensor 101 is disrupted. This disruption in the electrostatic field is detected as the engaged status of the child restraining assembly 201.

[0053] Fig. 5a, discloses a frontal view of the child restraining assembly 201. The child restraining assembly 201 may comprise of a belt assembly that comprises of a first harness 501 with a first clasp 509 at one of a distal end of the first harness 501. The belt assembly may comprise of a second harness 503 with a second clasp 507 at one of a distal end of the second harness 503. A spring connector 505 may be disposed at a proximal end of a latch plate 511 of the child restraining assembly 201. The spring connector 505 may be in a dis-engaged state when both the first clasp 509 and the second clasp 507 are not fastened to the latch plate 511, or when one of the first clasp 509 or second clasp 507 are not fastened to the latch plate 511. The spring connector 505 may be in an engaged state when both the first clasp 509 and the second clasp 507 are fastened to the latch plate 511. The second sensor 102 may be configured to detect the second status of the belt assembly of the child restraining assembly 201 as a fastened status when the spring connector 505 is in the engaged state. The second sensor 102 may be configured to detect the second status of the belt assembly of the child restraining assembly 201 as an unfastened status when the spring connector 505 is in the disengaged state.

[0054] Fig. 5b discloses an enlarged view of the latch plate 511, the first clasp 509 and the second clasp 507. The first clasp 509 and the second clasp 507 may be configured to slide into the latch plate 511. The latch plate 511 may be provisioned with fastening grooves to allow the first clasp 509 and the second clasp 507 to slide into the latch plate 511. The spring connector 505 may be in the dis-engaged state when both the first clasp 509 and the second clasp 507 are not fastened to the latch plate 511, or when one of the first clasp 509 or second clasp 507 are not fastened to the latch plate 511. In an embodiment, when the second sensor 102 is a reed sensor (as depicted in Fig. 5b), the spring connector 505 may be provisioned with a magnet. When the spring connector 505 is in the dis-engaged state, the magnet does not affect the reed sensor. The reed sensor would be in an open state and the second status of the belt assembly of the child restraining assembly 201 may be detected as unfastened status.

[0055] Fig. 5c discloses an enlarged view of the latch plate 511, the first clasp 509 and the second clasp 507. The first clasp 509 and the second clasp 507 may be configured to slide into the latch plate 511. The latch plate 511 may be provisioned with fastening grooves to allow the first clasp 509 and the second clasp 507 to slide into the latch plate 511. The spring connector 505 may be in the engaged state when both the first clasp 509 and the second clasp 507 are fastened to the latch plate 511. In an embodiment, when the second sensor 102 is a reed sensor (as depicted in Fig. 5c), the spring connector 505 may be provisioned with a magnet. When the spring connector 505 is in the engaged state, the magnetic field of the magnet pulls the leads of the reed sensor causing a circuit of the reed sensor to be closed. The reed sensor would then be in a closed state and the second status of the belt assembly of the child restraining assembly 201 may be detected as the fastened status.

[0056] Fig. 6a illustrates a top view of the vehicle in which the display unit 105 is positioned in a portion of the windshield outside a field of view of a driver of the vehicle when the windshield is a rear windshield. In another embodiment, the display unit 105 may be positioned in a portion of the windshield outside a field of view of a driver of the vehicle when the windshield is a front windshield. In another embodiment, the display unit 105 may be disposed at any of a window assemblies of the vehicle.

[0057] Fig. 6b illustrates a rear view of the vehicle in which the display unit 105 is positioned in a portion of the windshield outside a field of view of a driver of the vehicle when the windshield is a rear windshield.

[0058] Fig. 7a discloses a first configuration of a motor 104 configured to adapt a position of the display unit 105. The motor 104 may be mechanically connected to the display unit 105 by a fastening mechanism such as a hinge 701. In a position 1a, the back of the display unit 105a may be visible to an onlooker of the rear end of the vehicle, i.e., the position 1a may be the first position of non-visibility of the front of the display unit 105. The control unit 103 may control the motor 104 to adapt the position of the display unit 105 from position 1a to a position 1b by a 180^0 rotation of a lead of the motor 104, when the control unit 103 detects the presence of the child occupant within the child restraining assembly 201 based on the first status and the second status when the first status is engaged status and the second status is fastened status. The position 1b may be the second position of visibility.

[0059] Fig. 7b discloses a second configuration of a motor 104 configured to adapt a position of the display unit 105. The motor 104 may be mechanically connected to the display unit 105 by the hinge 701. In position a 2a, the display may be placed parallel to the roof of the vehicle, with the front of the display unit 105 facing the rood of the vehicle, i.e., the position 2a may be the first position of non-visibility of the front of the display unit 105. The control unit 103 may control the motor 104 to adapt the position of the display unit 105 from position 2a to a position 2b by a 90^0 rotation of the lead of the motor 104, when the control unit 103 detects the presence of the child occupant within the child restraining assembly 201 based on the first status and the second status when the first status is engaged status and the second status is fastened status. The position 2b may be the second position of visibility.

[0060] Fig. 8 discloses an exemplary method 800 for indicating presence of child in a vehicle.

[0061] The step 801, the control unit 103 may be configured to receive the first status of the child restraining assembly 201 to the vehicle seat 203 from the first sensor 101 as an engaged status and the second status of the belt assembly associated with the child restraining assembly 201 from the second sensor 102 as a fastened status.

[0062] At step 802, the control unit 103 may be configured to detect a presence of a child occupant within the child restraining assembly 201 based on the first status and the second status.

[0063] At step 803, the control unit 103 may be configured to display a notification on at least one display unit 105. The notification may be a message such as, without limitation to, “child on board” or may be a pictorial representation of a child to indicate the presence if a child occupant or a combination thereof.

[0064] In an embodiment, the control unit 103 may be configured to control the motor 104 mechanically connected to the display unit 105, to adapt a position of the display unit 105 from a first position of non-visibility (while viewing the display unit 105 from outside the vehicle) to a second position of visibility (while viewing the display unit 105 from outside the vehicle).

[0065] The above described one or more embodiments, may have the advantageous effect that, the child occupant in a vehicle is detected and effectively displayed in the vehicle at all times

of the day. The use of such a display may be advantageous in that fellow drivers and motorists may be encouraged to use caution when approaching vehicles with children.

[0066] The terms “an embodiment”, “embodiment”, “embodiments”, “the embodiment”, “the embodiments”, “one or more embodiments”, “some embodiments”, and “one embodiment” mean “one or more (but not all) embodiments of the invention(s)” unless expressly specified otherwise.

[0067] The terms “including”, “comprising”, “having” and variations thereof mean “including but not limited to”, unless expressly specified otherwise.

[0068] The enumerated listing of items does not imply that any or all of the items are mutually exclusive, unless expressly specified otherwise.

[0069] The terms “a”, “an” and “the” mean “one or more”, unless expressly specified otherwise.

[0070] A description of an embodiment with several components in communication with each other does not imply that all such components are required. On the contrary a variety of optional components are described to illustrate the wide variety of possible embodiments of the invention.

[0071] When a single device or article is described herein, it will be readily apparent that more than one device/article (whether or not they cooperate) may be used in place of a single device/article. Similarly, where more than one device or article is described herein (whether or not they cooperate), it will be readily apparent that a single device/article may be used in place of the more than one device or article, or a different number of devices/articles may be used instead of the shown number of devices or programs. The functionality and/or the features of a device may be alternatively embodied by one or more other devices which are not explicitly described as having such functionality/features. Thus, other embodiments of the invention need not include the device itself.

[0072] Finally, the language used in the specification has been principally selected for readability and instructional purposes, and it may not have been selected to delineate or

circumscribe the inventive subject matter. It is therefore intended that the scope of the invention be limited not by this detailed description, but rather by any claims that issue on an application based here on. Accordingly, the disclosure of the embodiments of the invention is intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the following claims.

[0073] While various aspects and embodiments have been disclosed herein, other aspects and embodiments will be apparent to those skilled in the art. The various aspects and embodiments disclosed herein are for purposes of illustration and are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

WE CLAIM:

1. A system for indicating presence of child in a vehicle, comprising:

at least one display unit (105) adapted to be disposed on at least one of: a windshield of a vehicle and a window of the vehicle;

a first sensor (101) configured to detect a first status of a child restraining assembly (201) fastened to a vehicle seat (203);

a second sensor (102) configured to detect a second status of a belt assembly of the child restraining assembly;

a control unit (103) communicably coupled to the first sensor (101), the second sensor (102) and the at least one display unit (105), wherein the control unit (103) is configured to:

detect a presence of a child occupant within the child restraining assembly (201) based on the first status and the second status; and

display a notification based on the presence of the child occupant.

2. The system as claimed in claim 1, wherein the notification indicates the presence of the child occupant when the first status is an engaged status and the second status is a fastened status.

3. The system as claimed in claim 1, wherein the at least one display unit (105) is positioned in a portion of the windshield outside a field of view of a driver of the vehicle when the windshield is a rear windshield.

4. The system as claimed in claim 1, wherein the child restraining assembly (201) is engaged to the vehicle seat (203) by one of: an International Standard Organisation FIX (ISOFIX) assembly or a Lower Anchors and Tethers for Children (LATCH) assembly.

5. The system as claimed in claim 1, wherein the first status is one of: an engaged status and a disengaged status.

6. The system as claimed in claim 1, wherein the second status is one of: a fastened status and an unfastened status.

7. The system as claimed in claim 1, wherein the first sensor (101) is one of an inductive proximity sensor and a capacitive proximity sensor.

8. The system as claimed in claim 1, wherein the second sensor (102) is a reed sensor.

9. The system as claimed in claim 1, further comprising:

a motor (104) communicably coupled to the control unit (103) and mechanically connected to the at least one display unit (105),

wherein the motor (104) is configured to adapt a position of the at least one display unit (105).

10. A method for indicating presence of child in a vehicle, comprising:

receiving, by a control unit (103), a first status of a child restraining assembly (201) to a vehicle seat from a first sensor (101) as an engaged status and a second status of a belt assembly associated with the child restraining assembly (201) from a second sensor (102) as a fastened status;

detecting, by the control unit (103), a presence of a child occupant within the child restraining assembly (201) based on the first status and the second status; and

displaying, by the control unit (103), a notification on at least one display unit (105).

11. The method as claimed in claim 10, further comprising:

controlling, by the control unit (103), a motor (104), mechanically connected to the at least one display unit (105), to adapt a position of the at least one display unit (105).

Dated this 14th day of March 2024

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ABSTRACT

A SYSTEM AND METHOD FOR INDICATING PRESENCE OF CHILD IN A VEHICLE

The present disclosure relates to system for indicating presence of child occupant in vehicle. System comprises of at least one display unit (105) adapted to be disposed on at least one of windshield of vehicle and window of vehicle. System comprises of first sensor (101) configured to detect first status of child restraining assembly (201) fastened to vehicle seat (203). System comprises of second sensor (102) configured to detect second status of belt assembly of child restraining assembly (201). System comprises of control unit (103) communicably coupled to first sensor (101), second sensor (102) and at least one display unit (105). The control unit (103) is configured to detect presence of child occupant within child restraining assembly (201) based on first status and second status. Control unit (103) is configured to display notification based on presence of child occupant.

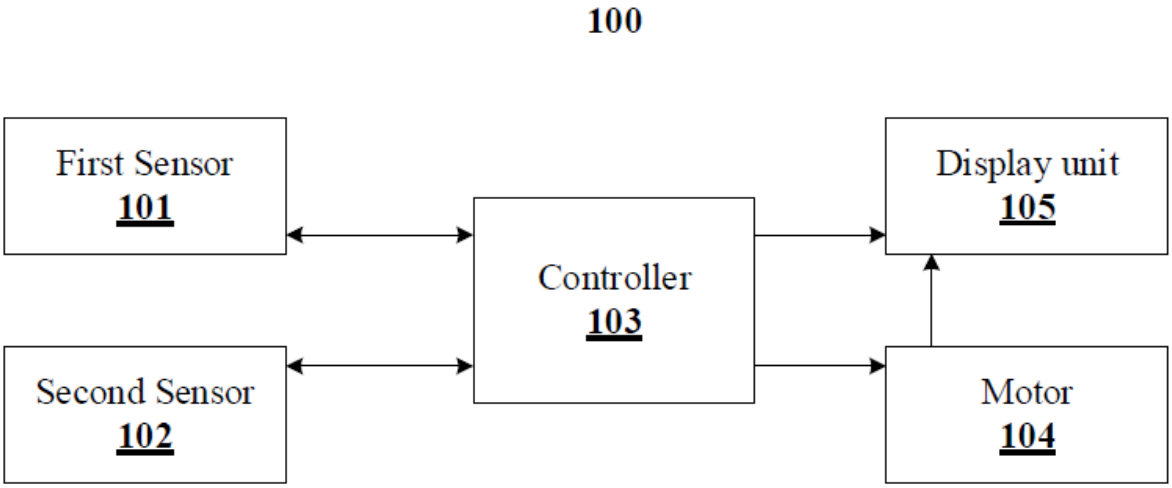

Fig. 1

100

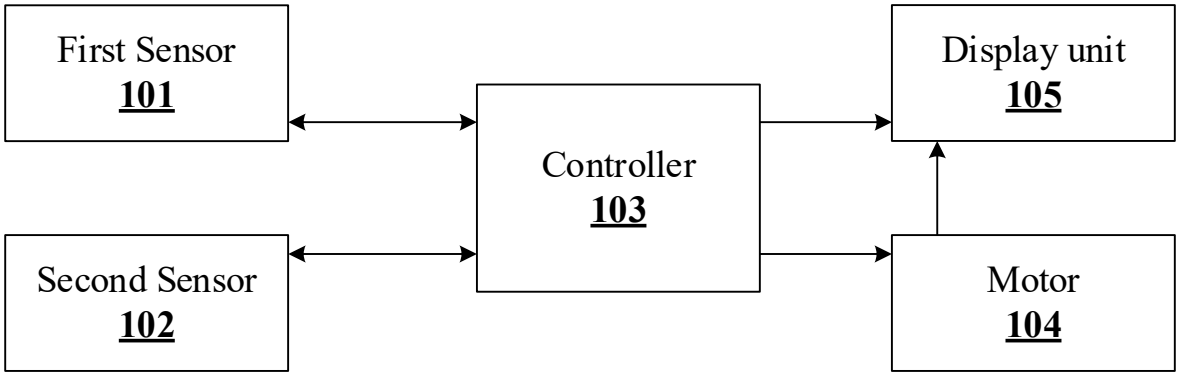

Fig. 1

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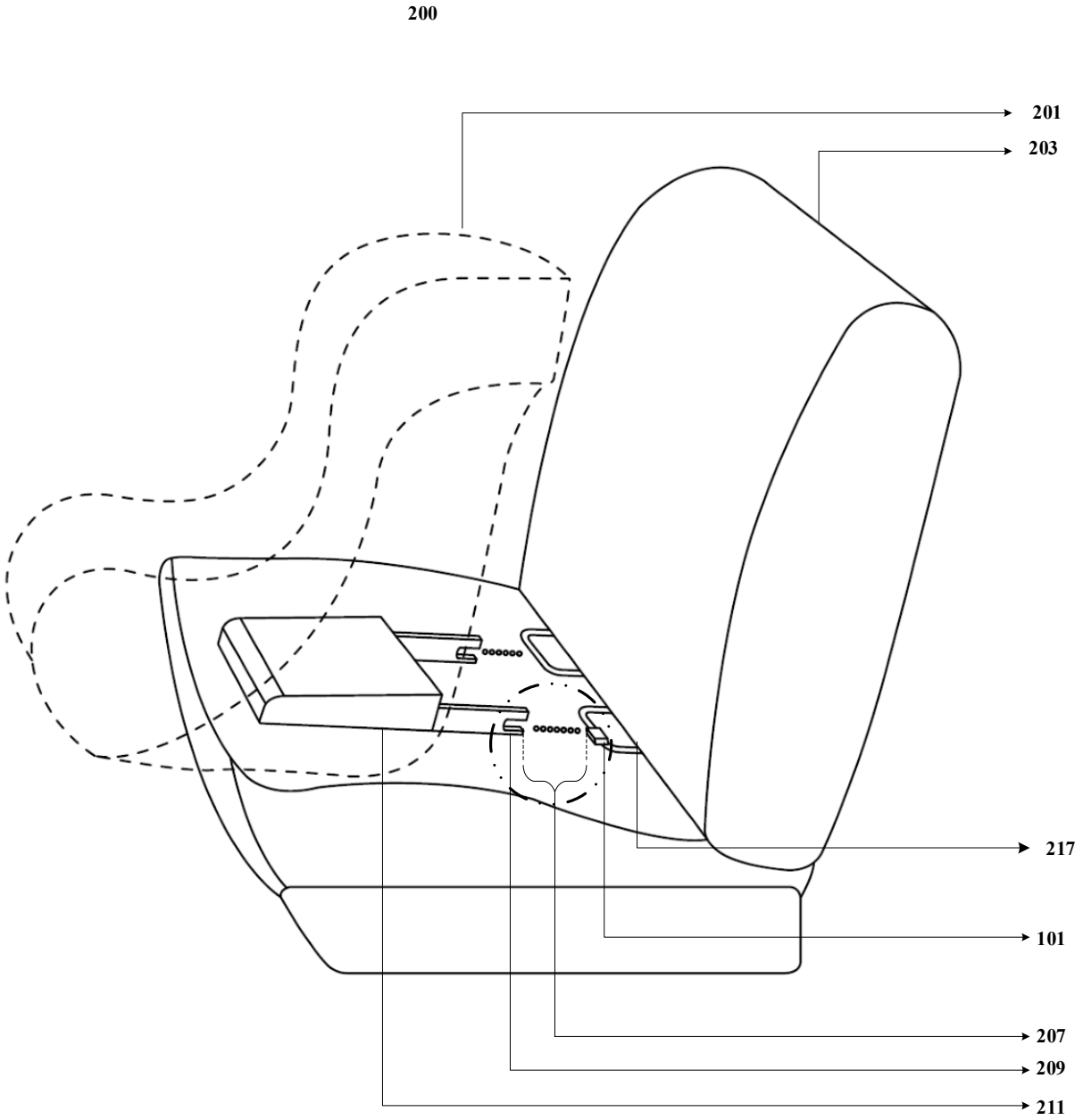

Fig. 2a

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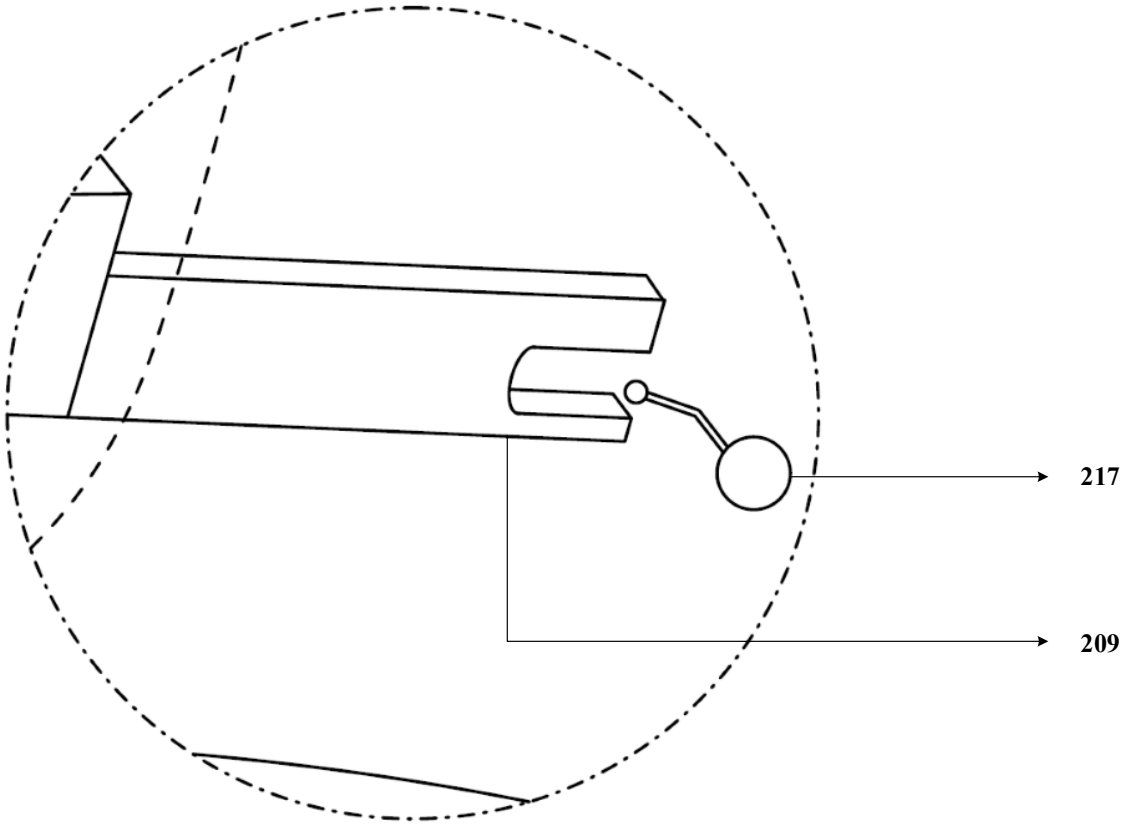

Fig. 2b

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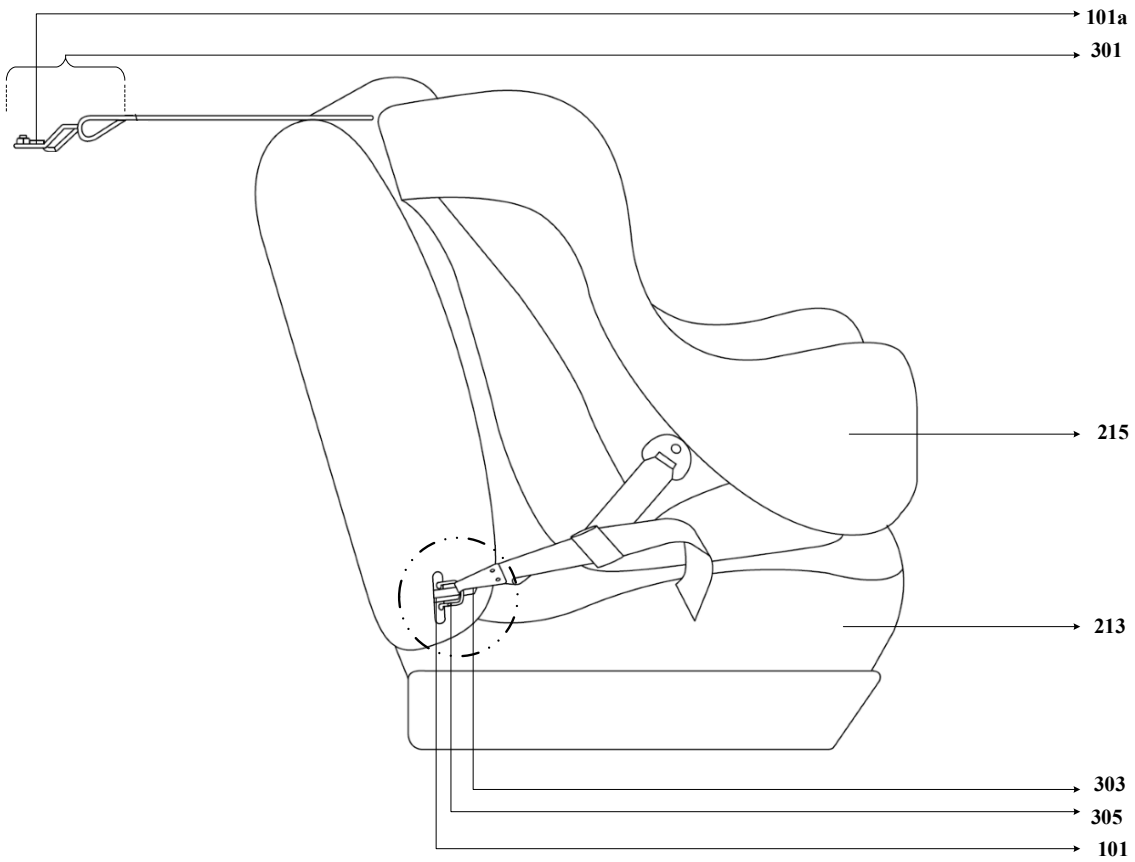

Fig. 3a

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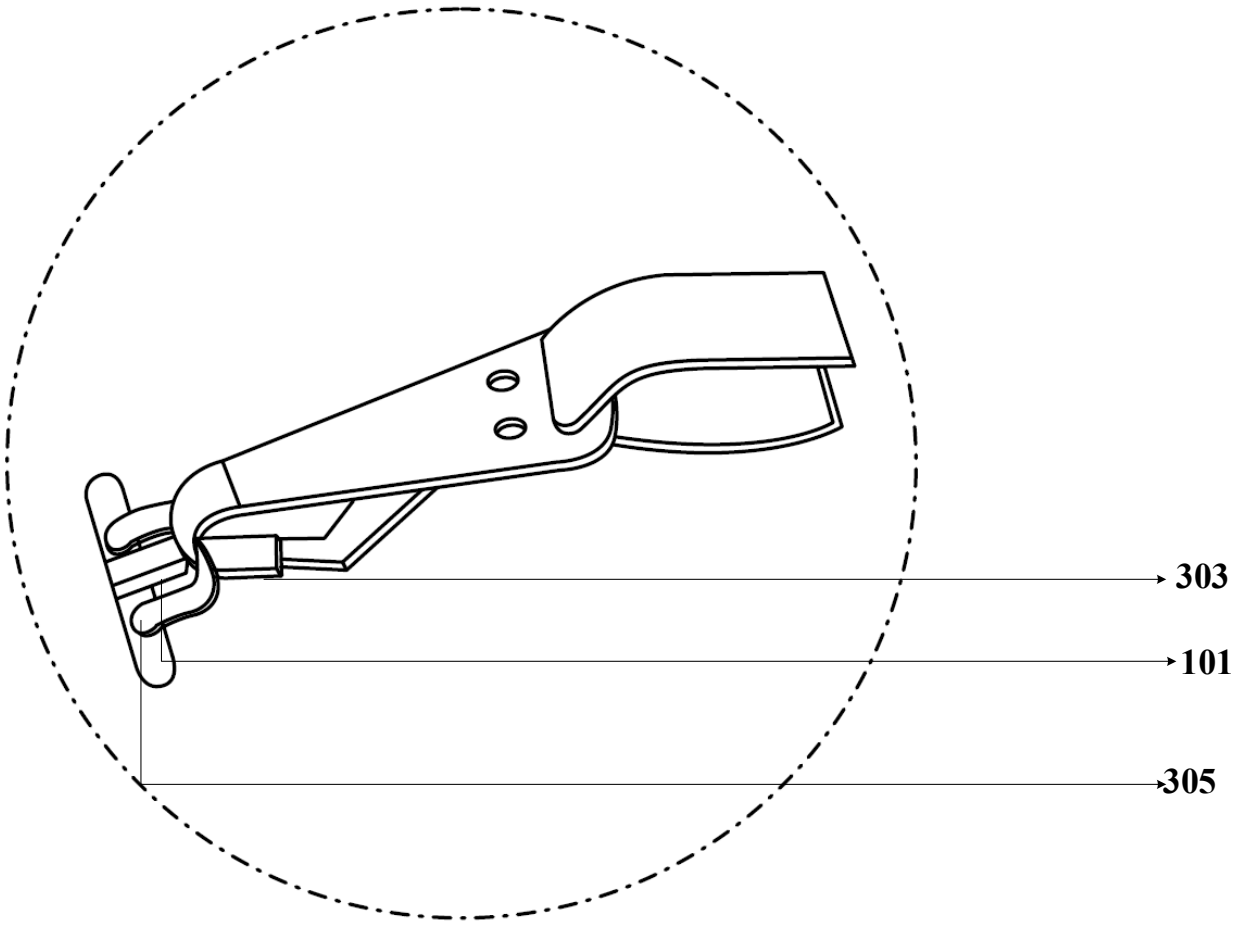

Fig. 3b

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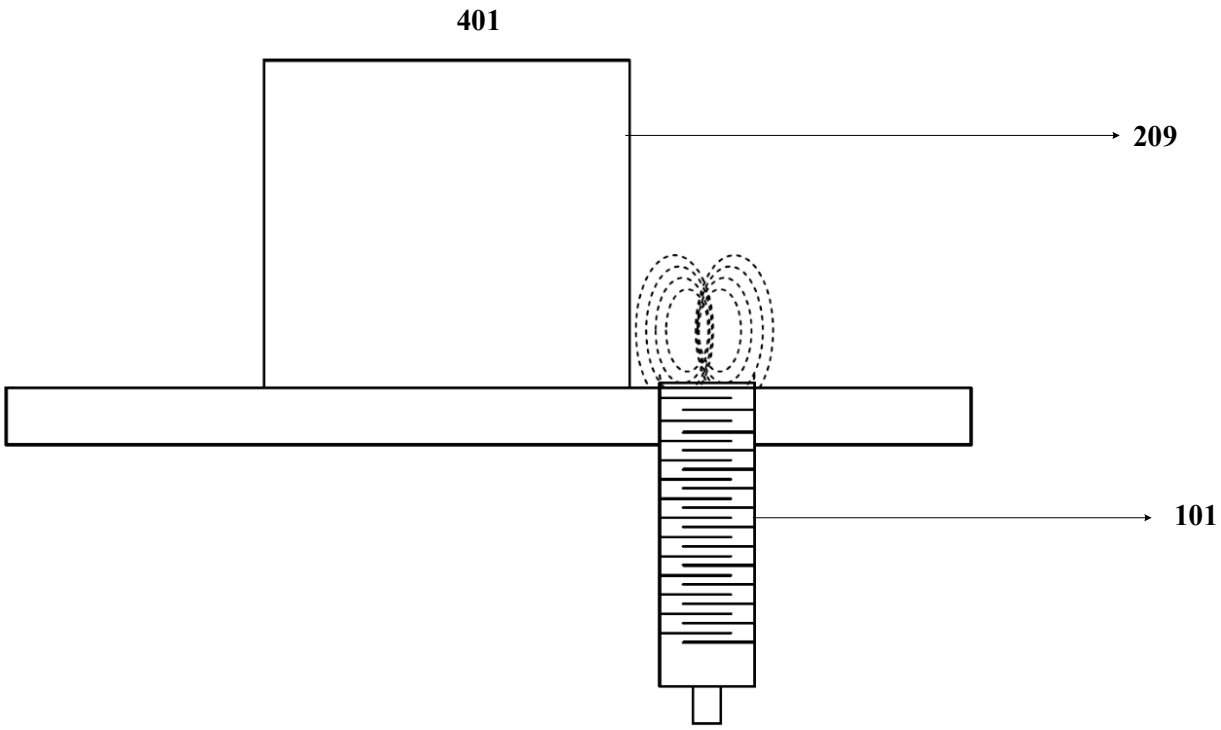

Fig. 4a

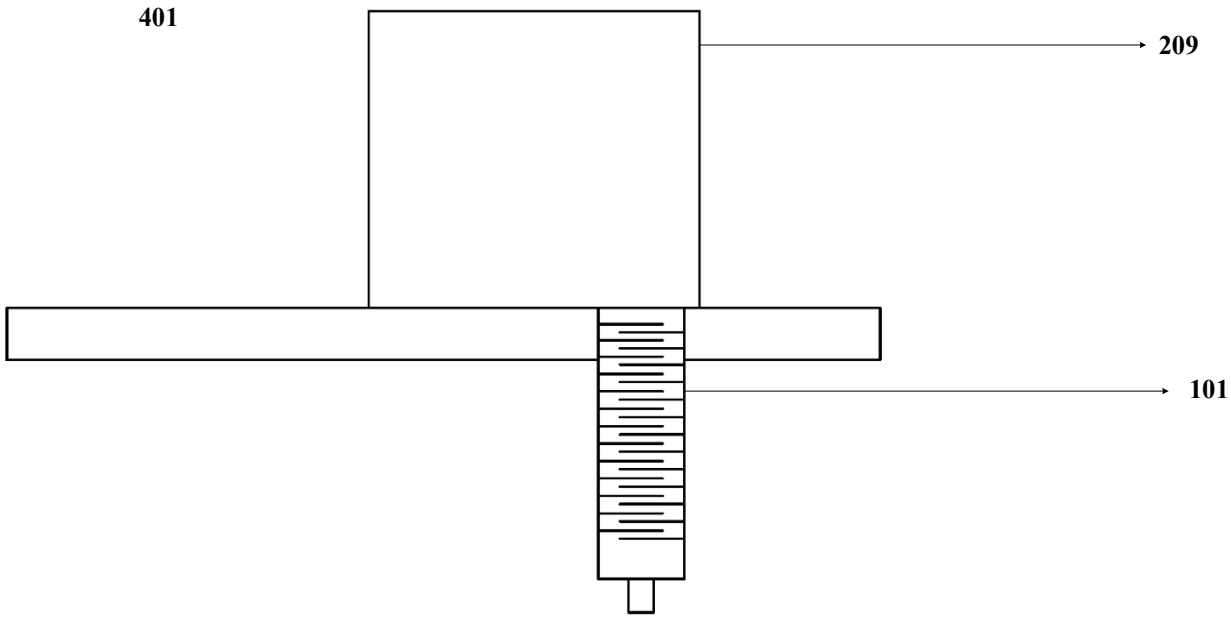

Fig. 4b

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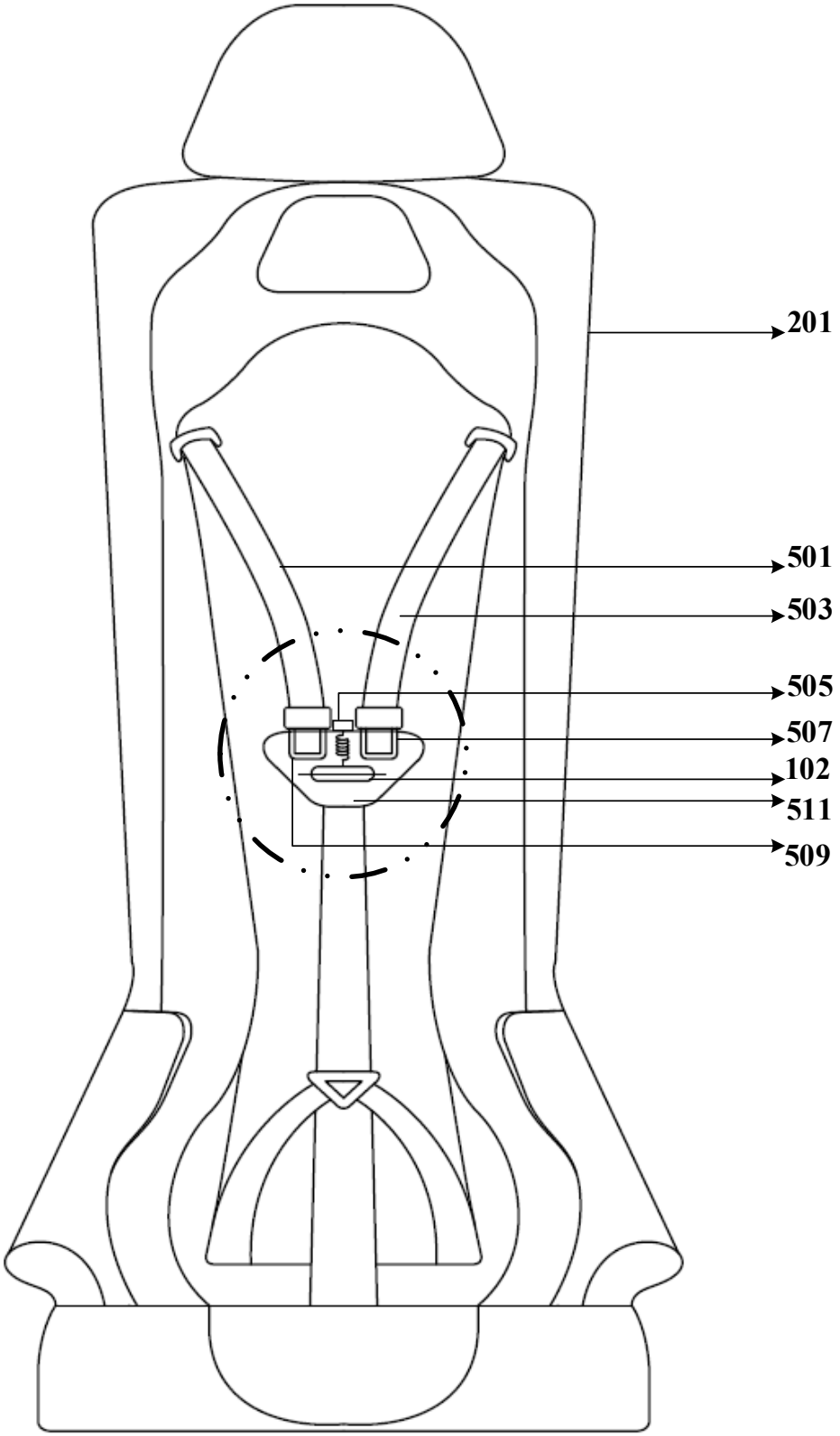

Fig. 5a

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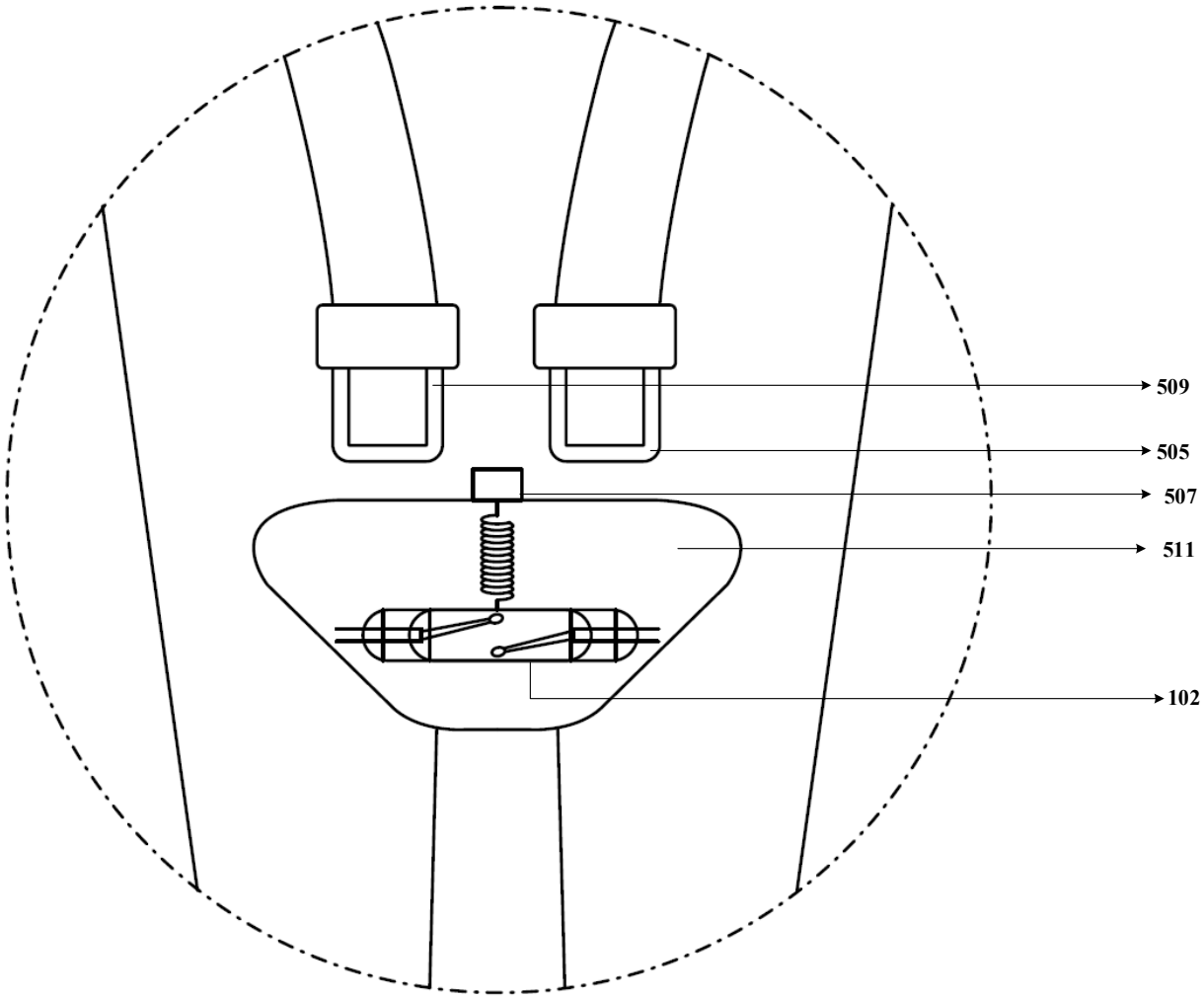

Fig. 5b

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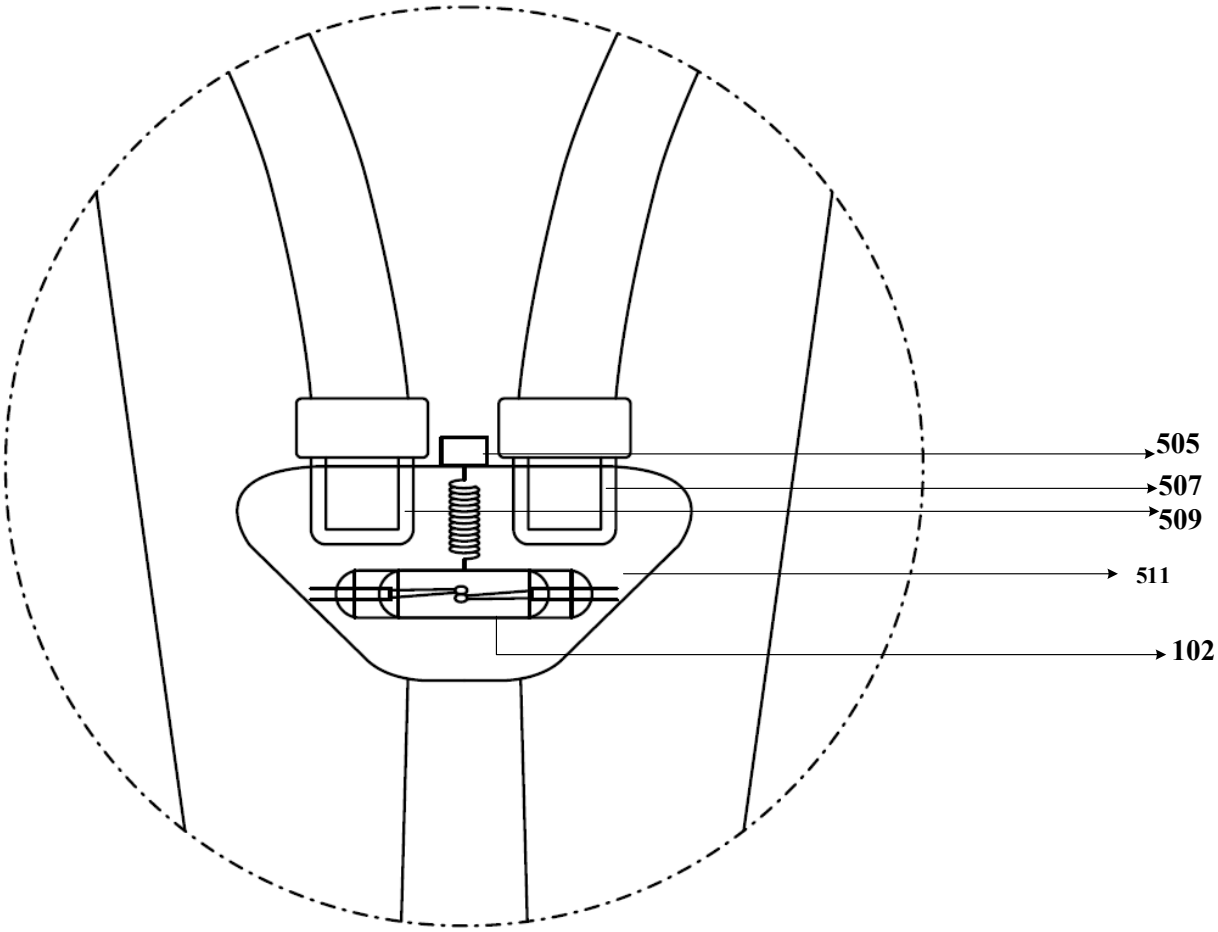

Fig. 5c

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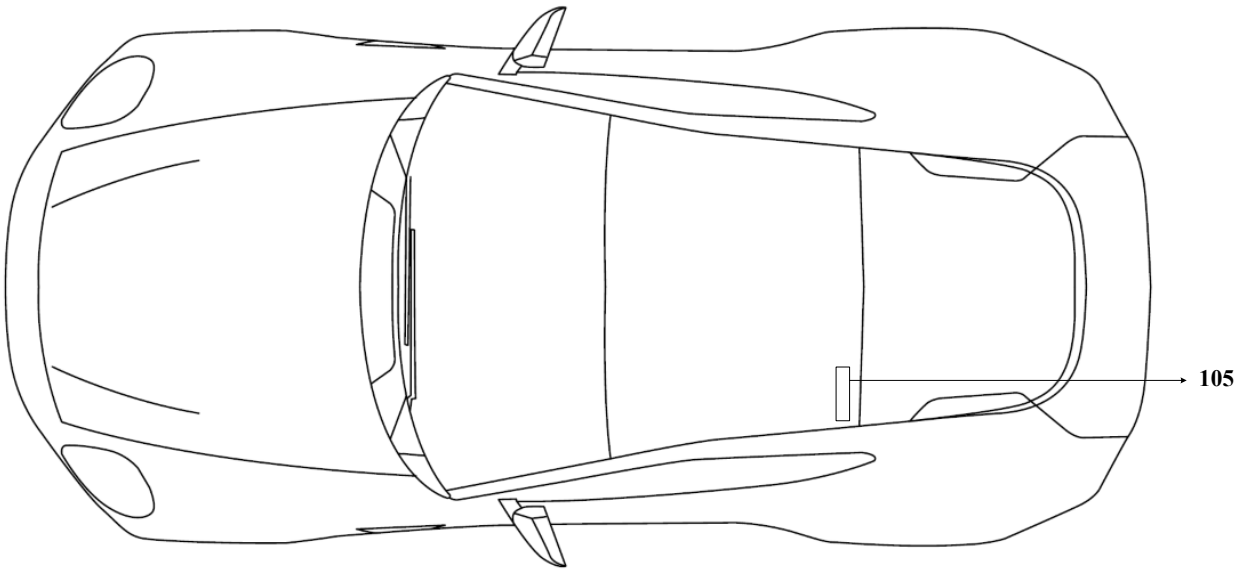

Fig. 6a

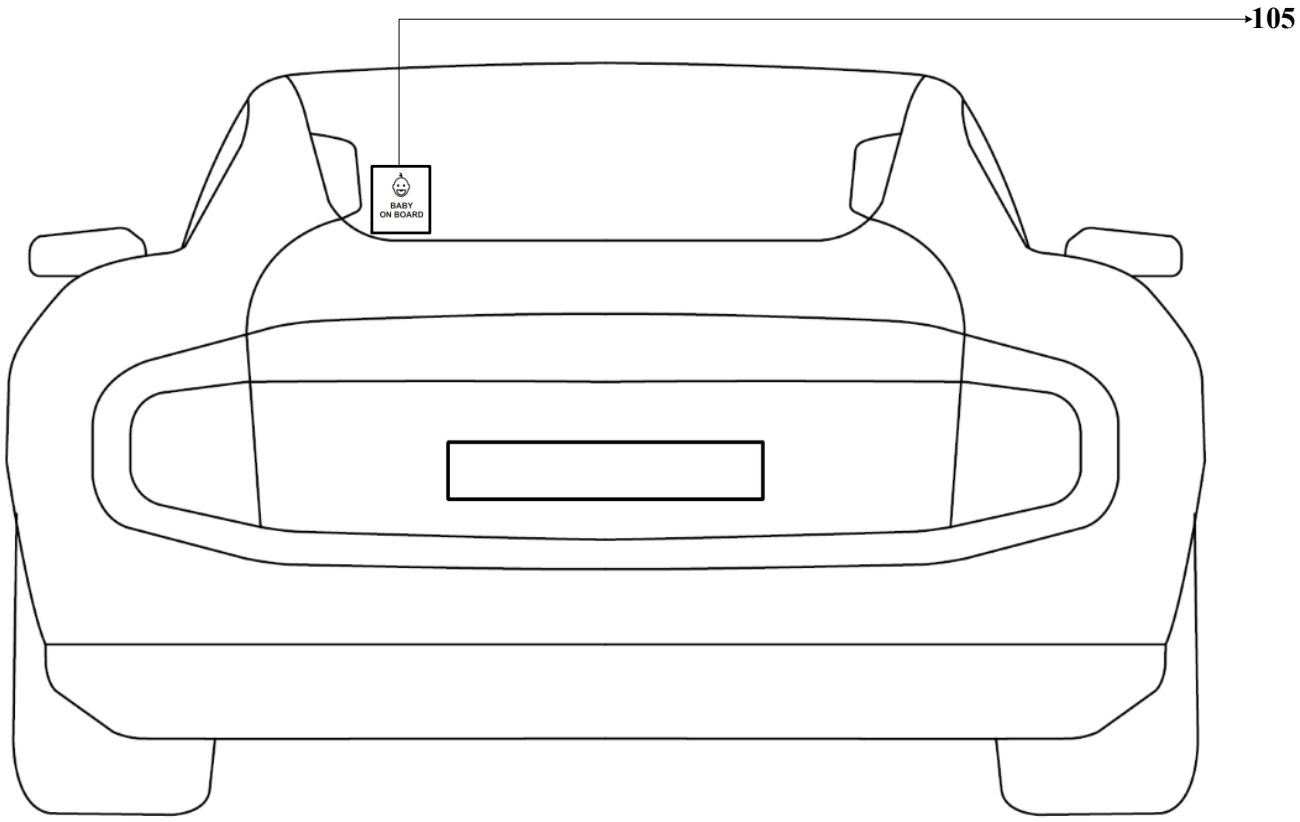

Fig. 6b

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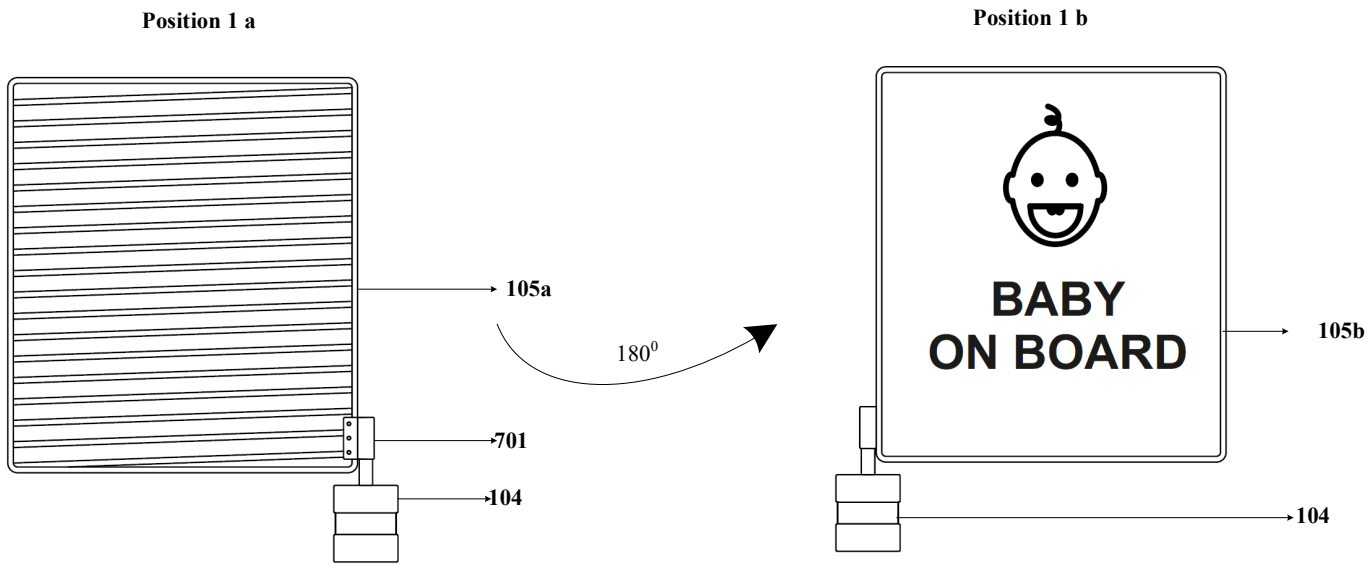

Fig. 7a

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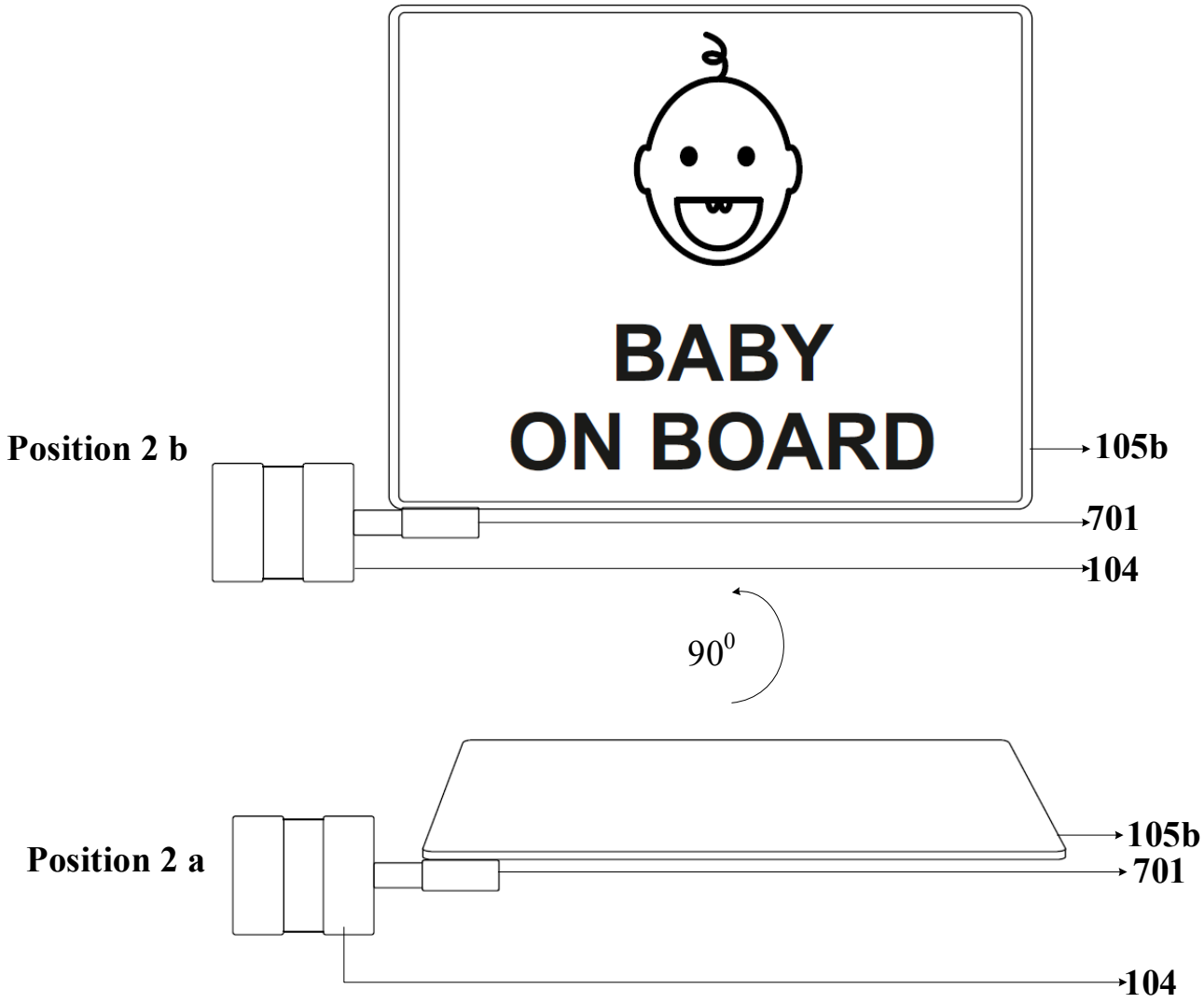

Fig. 7b

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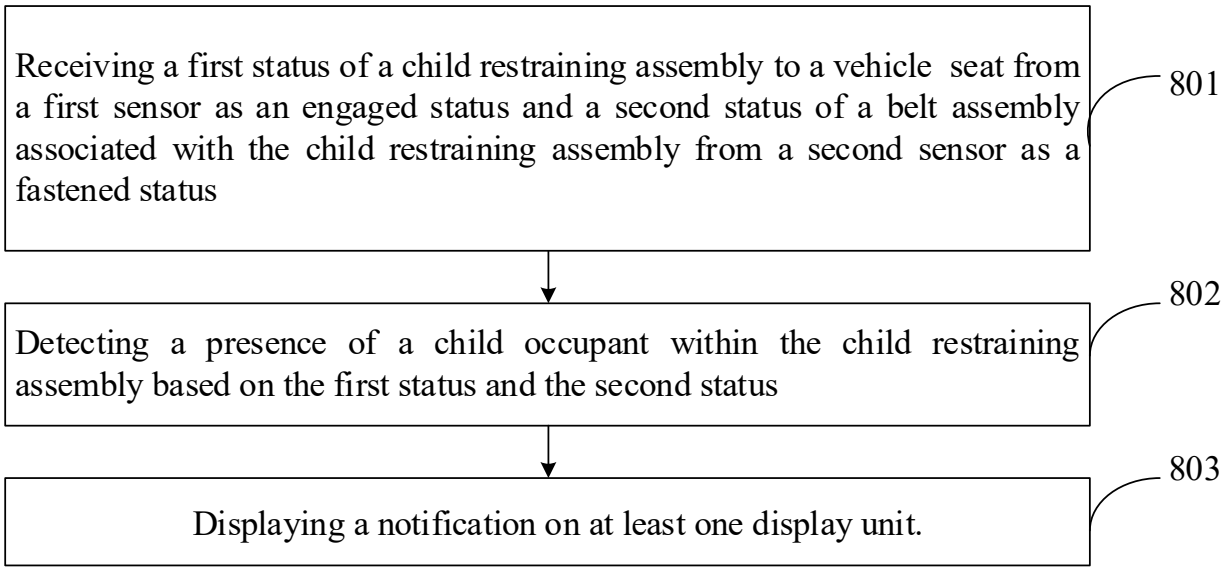

Fig. 8

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