(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 September 2022 (29.09.2022)

WIPO | PCT

(10) International Publication Number
WO 2022/204361 A1

(51) International Patent Classification:
B60R 5/02 (2006.01) *B60J 5/12* (2006.01)
B60J 5/10 (2006.01) *B60Q 1/30* (2006.01)

(21) International Application Number:
PCT/US2022/021666

(22) International Filing Date:
24 March 2022 (24.03.2022)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/165,546 24 March 2021 (24.03.2021) US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

WO 2022/204361 A1

(54) Title: FRONT STORAGE AND REAR WINDOW GATE RETRACTION FEATURES

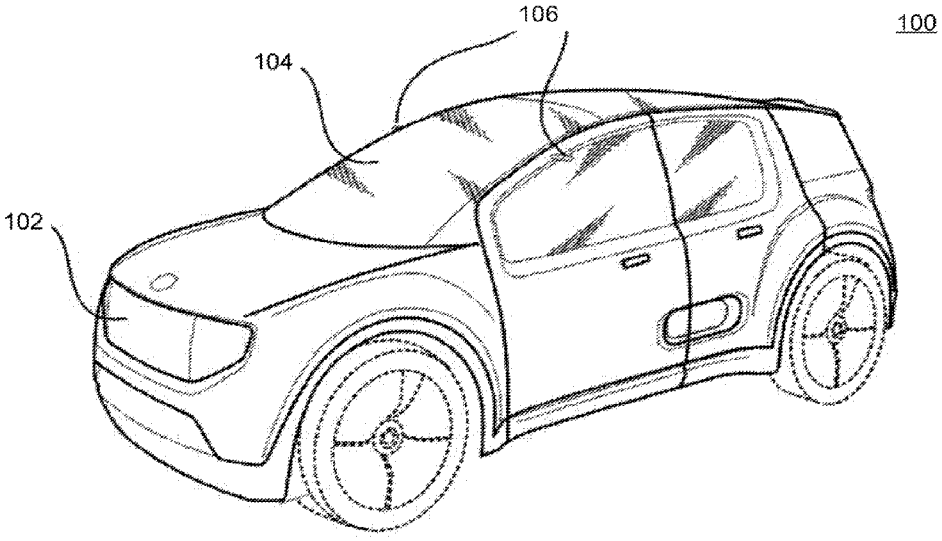

FIG. 1A

(57) Abstract: Disclosed are improved features of a vehicle including a front storage access feature and a rear storage access feature. The front storage access feature includes a front drawer including a front display panel. The front display panel can be between a front left light and a rear left light. The front drawer can be configured to extend to allow access to a front storage area. The front drawer can be configured to retract to close access to a front storage area and form a front-facing surface. The rear access storage access feature includes a rear gate including a rear display panel. The rear display panel can be between a rear left light and a rear right light. The rear gate can be configured to extend to retract to allow access to a rear storage area.

[Continued on next page]

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

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

FRONT STORAGE AND REAR WINDOW GATE RETRACTION FEATURES

Cross Reference Related Applications

[01] This application claims priority of US applications 63/165,546 which was filed on March 24, 2021, and which is incorporated herein in its entirety by reference.

Technical Field

[02] The present disclosure relates to an innovative design for an electric vehicle having additional features including a retractable storage feature in the front of the vehicle and a retractable rear gate. Embodiments of the present disclosure relate to inventive and unconventional apparatus and methods for providing a unique front storage feature, a rear center display panel integrating rear lamps, and retractable reargate stowable behind the rear bumper of automobiles in its retracted position.

Background

[03] Current vehicles typically include front and rear lights for lighting roadways, and providing signaling to other vehicles, such as running lights, turning signaling, or braking signaling. Such lights can be advantageously placed at a height for other drivers to quickly ascertain the location of the vehicle and the meaning of any signaling. In current vehicles, vehicles may include lights around a trunk or gate door. As disclosed herein, improved lights can be integrated into trunks and doors to provide messages to other drivers, and disclosed trunk or gate configurations can continue to allow users access to vehicle storage areas.

[04] Current vehicles require a large area behind a vehicle for a gate to swing up or away from a vehicle. Disclosed improved systems for rear vehicle storage allows access to vehicle storage areas without a gate swinging up or away from the vehicle.

[05] Current vehicles also provide limited access to storage in a front portion of a vehicle. Disclosed improved systems for front vehicle storage allows access to front vehicle storage areas.

Brief Summary

[06] Aspects of the present disclosure relate to vehicles having storage access features. Additionally, aspects of the present disclosure relate to vehicles having front and/or rear lighting displays.

[07] According to various embodiments of the present disclosure, a vehicle can comprise a rear gate comprising a rear lighting panel, wherein the rear lighting panel is

between a rear left light and a rear right light; a rear bumper, wherein the rear gate is configured to retract behind or into the rear bumper. In some embodiments, the rear gate can be configured to actuate to open or close. In some embodiments, the rear gate can be configured to actuate in response to a remote electronic signal. In some embodiments, the remote electronic signal can be associated with a remote device, such as a phone or a key fob. In some embodiments, the rear gate can be configured to actuate in response to an input, wherein the input may comprise a button being depressed, a command from a remote device, or a processor determining to open/close the rear gate.

[08] According to various embodiments of the present disclosure, a vehicle can comprise a rear lighting panel configured to be integrated with a rear left light and a rear right light. The rear lighting panel can be part of a rear gate. According to some embodiments, the rear gate can be configured to retract by moving from a first position that closes access to a rear trunk to a second position that allows access to the rear trunk, wherein the second position is below the first position. In some embodiments, the second position is below the rear left light and the rear right light.

[09] According to various embodiments of the present disclosure, a rear gate can comprise a rear window. According to some embodiments, the rear window can be configured to retract into the rear gate. According to some embodiments, the retraction of the rear window into the rear gate can occur before the rear gate retracts behind or into the rear bumper.

[10] According to various embodiments of the present disclosure, a vehicle can comprise a front drawer including a front display or a front gate including a front display, wherein the front display is between a front left light and a front right light; and a front-facing portion below a front windshield and/or above a front bumper, wherein the front-facing portion includes the front drawer or the front gate. The front-facing portion can comprise a grille, a bonnet/trunk, a hood, a front bumper, and/or portions of front-facing surfaces of a car.

[11] According to various embodiments, the front drawer can be configured to actuate to open or close. In some embodiments, the rear gate can be configured to actuate in response to a remote electronic signal. In some embodiments, the remote electronic signal can be associated with a remote device, such as a phone or a key fob. In some embodiments, the rear gate can be configured to actuate in response to an input, wherein the input may comprise a button being depressed, a command from a remote device, or a processor determining to open/close the rear gate.

[12] According to various embodiments of the present disclosure, a vehicle can comprise a front lighting panel configured to be integrated with a front left light and a front right light. The front lighting panel can be part of a front gate or drawer.

[13] According to some embodiments, a vehicle can comprise a front gate. In some embodiments, the front gate can be configured to retract by moving from a first position that closes access to a front trunk to a second position that allows access to the front trunk, wherein the second position is below the first position. In some embodiments, the second position is below the front left light and the front right light.

[14] According to some embodiments, a vehicle can comprise a front drawer. According to some embodiments, the front drawer can be configured to retract by moving from a first position that closes access to a front storage area to a second position that allows access to the front storage area, wherein the second position is forward of the first position. According to some embodiments, the front display can be a portion of a front light system. According to some embodiments, the front display can be configured to display messages.

[15] Further features of the disclosed technology, and the advantages offered thereby, are explained in greater detail hereinafter with reference to specific embodiments illustrated in the accompanying drawings, wherein like elements are indicated by like reference designators.Reference will now be made to the accompanying figures, which are not necessarily drawn to scale.

Brief Description of the Drawings

[16] FIGS. 1A & 1B are exemplary illustrations of a first isometric view and second isometric view of an embodiment of an electric vehicle of the present disclosure.

[17] FIG. 2 is a top view of an electric vehicle, consistent with some embodiments of the present disclosure.

[18] FIGS. 3A & 3B are exemplary illustrations of a first side view and a secondside view of an electric vehicle, consistent with some embodiments of the present disclosure.

[19] FIG. 4 are exemplary illustrations of a front view and a rear view of an electric vehicle, consistent with some embodiments of the present disclosure.

[20] FIG. 5 is exemplary illustrations of drawer integrated with the front display panel extending out of an electric vehicle, consistent with some embodiments of the present disclosure.

[21] FIGS. 6A, 6B, and 6C are exemplary illustrations of the rear trunk window moving in the lower trunk of an electric vehicle, consistent with some embodiments of the present disclosure.

[22] FIGS. 7A & 7B are exemplary illustrations of the rear trunk window and thelower trunk moving into a bumper of an electric vehicle, consistent with some embodiments of the present disclosure.

Detailed Description

[23] The following detailed description refers to the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the following description to refer to the same or similar parts. While several illustrative embodiments are described herein, modifications, adaptations and other implementations are possible. For example, substitutions, additions, or modifications may be made to the components and steps illustrated in the drawings, and the illustrative methods described herein may be modified by substituting, reordering, removing, or adding steps to the disclosed methods. Accordingly, the following detaileddescription is not limited to the disclosed embodiments and examples.

[24] Embodiments of the present disclosure are directed to a design, construction, and methods of use of certain component of an automobile design. The design has several unique features. First, the body surface is sculpted to surround the wheels. The wheels are larger than conventional wheels for a vehicle of comparable size. Second, the wheels are positioned outward from the body providing a wider track and enabling the car to be more maneuverable when other vehicles or obstacles are positioned beside the vehicle. Third, the front of the vehicle features a unique drawer design integrated with the front lamps of the vehicle. The drawer may include a display system in the front of the drawer and may be actuated by a smartphone, key fob, or other remote device. Fourth, the daylight openings of the side windows include a unique chamfer around the edge of the openings to provide a unique shade design. The A-pillar of the vehicle may include a unique kick-back design. Fifth, the rear gate of the vehicle is configured to retract into the bumper-the rear glazing first moves into the body of therear gate, and the rear gate/glazing assembly then moves into a cassette located behind the rear bumper of the vehicle. Sixth, the rear of the vehicle presents a graphic design integrating all rear lamps and a center display panel positioned in the lower trunk panel of the rear gate.

[25] FIGS. 1A & 1B are exemplary illustrations of first isometric and second isometric views of a vehicle design consistent with some embodiments of the present disclosure. As illustrated in FIG. 1A, vehicle 100 is shown in a first isometric view with a unique front display panel 102 that may include the front lights of the electric vehicle and a drawer that may be electronically opened remotely with a smartphone, key fob, orother remote device. The unique front display 102 has a single display that may providemessages to the electric vehicle's owner or others. The vehicle design 100 may also include a single panoramic window 104 covering the front windshield, all or a portion of the roof, and rear side windows of the trunk of vehicle 100. The vehicle design 100 mayinclude side windows 106 located above the driver and passenger's side windows. As illustrated in FIG. 1B, the vehicle design 100 is depicted in a second isometric view withpanoramic window 104, unique retractable rear trunk window 108, retractable rear trunk gate 110, unique rear center display and rear lighting panel 112, and rear bumper 114. The rear center display panel 112 may integrate a single display and rear lighting that may include the rear lights of the vehicle 100. The rear center display panel 112 may provide messages to the driver, person driving behind the vehicle 100, or persons who can see the rear display panel outside the vehicle. Retractable rear trunk window 108, retractable trunk gate 110, including rear center display panel 112 may be electronicallystowed behind rear bumper 114.

[26] FIG. 2 is a top view of an electric vehicle design, consistent with some embodiments of the present disclosure. As illustrated in FIG. 2, in one embodiment, electric vehicle 200 may have front display panel 202, panoramic window 204, and unique rear center display panel 206. Vehicle design 200 may include a body extendingfrom the side of vehicle over large tires 208 extending beyond the sides of vehicle 200. Vehicle 200 may be the same as the electric vehicle 100.

[27] FIGS. 3A and 3B are exemplary illustrations of first and second side viewsof vehicle 300, consistent with some embodiments of the present disclosure. As illustrated in FIG. 3, first side view 302 and second side view 304 of vehicle 300 may beof the same as the vehicle design 200 or 100.

[28] FIG. 4 is an exemplary illustration of front and rear views of vehicle design 400, consistent with some embodiments of the present disclosure. FIG. 4 depicts vehicle 400 in front 402 and rear 410 views. Vehicle 400 may be the same as the vehicle 300, 200, or 100. Front view 402 may present front display panel 404 with a single display

integrating left 406 and right 408 side front lights. Front display panel 404 may include a drawer.

[29] Rear view 410 may present a unique rear center display panel 412 with a center display integrating right 414 and left 416 side rear lights.

[30] FIG. 5 depicts drawer 502 integrated with the front display panel 504 extending from vehicle 500, consistent with some embodiments of the present disclosure. As illustrated in FIG. 5, vehicle 500 may include drawer 502 that may be remotely electronically extended from the unique front center display panel with a smartphone, key fob, or other remote device. Drawer 502 may open to allow access to a front storage area. Drawer 502 may conform to a front surface of vehicle 500 to form a bonnet, a grille, or a front aerodynamic surface. Front of drawer 502 may be a portioned display 504 of the unique front center display. Vehicle 500 may be the same as vehicle 400,300,200, and/or 100.

[31] Although described with reference to the front, it is contemplated that one or more features of a drawer 502 in figures FIG. 5 may be incorporated into a rear drawer. For example, a rear drawer may be configured to extend to allow access to a rear storage area.

[32] FIG. 6A, 6B, and 6C are exemplary illustrations of the rear window or glazing 604 moving in the lower rear gate 608 of vehicle 600, consistent with some embodiments of the present disclosure. FIG. 6A depicts a first side view 602 showing rear trunk window or glazing 604 in a position or state where the rear trunk window may not provide an opening or access to vehicle 600 trunk space. Vehicle 600 may be the same as the electric vehicle 500, 400, 300, 200, and/or 100.

[33] FIG 6B depicts second side view 606 of rear trunk window 604 lowered into rear gate 608 behind rear center display panel. FIG. 6C depicts rear trunk window 604, rear gate 608 including rear center display panel being moved down behind vehicle600 bumper.

[34] FIG. 7A depicts rear trunk window and the rear gate moving into a bumperof vehicle 700, consistent with some embodiments of the present disclosure. Vehicle 700 may be the same as electric vehicle 600, 500, 400, 300, 200, and/or 100. First view 702 depicts rear window, and rear gate including rear center display panel stowedbehind the bumper 704. FIG. 7B depicts a perspective view of vehicle 700 depicting trunk of vehicle 700 in the open position with the rear window and gate retracted. Rearwindow, rear gate including rear center display panel may be stowed behind bumper ofvehicle 700.

[35] Although described with reference to the rear trunk, it is contemplated that one or more features of a rear gate in figures FIGS. 6A-6C and 7A-7B may be incorporated

into a front gate. For example, a front gate may be configured to retract into or behind a front bumper to allow access to a front storage area.

[36] While the present disclosure has been shown and described with reference to particular embodiments thereof, it will be understood that the present disclosure can be practiced, without modification, in other environments. The foregoingdescription has been presented for purposes of illustration. It is not exhaustive and is not limited to the precise forms or embodiments disclosed. Modifications and adaptations will be apparent to those skilled in the art from consideration of the specification and practice of the disclosed embodiments.

[37] Moreover, while illustrative embodiments have been described herein, the scope of any and all embodiments having equivalent elements, modifications, omissions, combinations (e.g., of aspects across various embodiments), adaptations and/or alterations as would be appreciated by those skilled in the art based on the present disclosure. The limitations in the claims are to be interpreted broadly based on the language employed in the claims and not limited to examples described in the present specification or during the prosecution of the application. The examples are to be construed as non-exclusive. Furthermore, the steps of the disclosed methods may be modified in any manner, including by reordering steps and/or inserting or deleting steps. It is intended, therefore, that the specification and examples be considered as illustrative only, with a true scope and spirit being indicated by the following claims andtheir full scope of equivalents.

CLAIMS

What is claimed is:

1. A vehicle comprising:

a rear gate comprising a rear lighting panel, wherein the rear lighting panel is between a rear left light and a rear right light;

a rear bumper, wherein the rear gate is configured to retract into or behind the rear bumper.

2. The vehicle of claim 1, wherein the rear gate is configured to actuate to open or close.

3. The vehicle of claim 1, wherein the rear gate is configured to actuate in response to a remote electronic signal.

4. The vehicle of claim 1, wherein the remote electronic signal is associated with a phone or a key fob.

5. The vehicle of claim 1, wherein the center lighting panel is configured to be integrated with the rear left light and the rear right light.

6. The vehicle of claim 1, wherein the rear gate is configured to retract by moving from a first position that closes access to a rear trunk to a second position that allows access to the rear trunk, wherein the second position is below the first position.

7. The vehicle of claim 6, wherein the second position is below the rear left light and the rear right light.

8. The vehicle of claim 1, wherein the rear gate further comprises a rear window.

9. The vehicle of claim 8, wherein the rear window is configured to retract

into the rear gate.

10. The vehicle of claim 9, wherein the retraction of the rear window into the rear gate occurs before the rear gate retracts into or behind the rear bumper.

11. The vehicle of claim 1, further comprising:

a front drawer including a front display, wherein the front display is between a front left light and a front right light;

a front-facing portion below a front windshield, wherein the front-facing portion includes the front drawer.

12. A vehicle comprising:

a front drawer including a front display, wherein the front display is between a front left light and a front right light;

a front-facing portion below a front windshield or above a front bumper, wherein the front-facing portion includes the front drawer.

13. The vehicle of claim 12, wherein the front drawer is configured to actuate to open or close.

14. The vehicle of claim 12, wherein the front drawer is configured to actuate in response to a remote electronic signal.

15. The vehicle of claim 12, wherein the remote electronic signal is associated with a phone or a key fob.

16. The vehicle of claim 12, wherein the front display is configured to be integrated with the front left light and the front right light.

17. The vehicle of claim 12, wherein the front drawer is configured to retract by moving from a first position that closes access to a front storage area to a second position that allows access to the front storage area, wherein the second position is forward of the first position.

18. The vehicle of claim 12, wherein the front display is a portion of a front light system.

19. The vehicle of claim 12, wherein the front display is configured to display messages.

20. The vehicle of claim 12, further comprising:

a rear gate comprising a rear lighting panel, wherein the rear lighting panel is between a rear left light and a rear right light;

a rear bumper, wherein the rear gate is configured to retract behind the rear bumper.

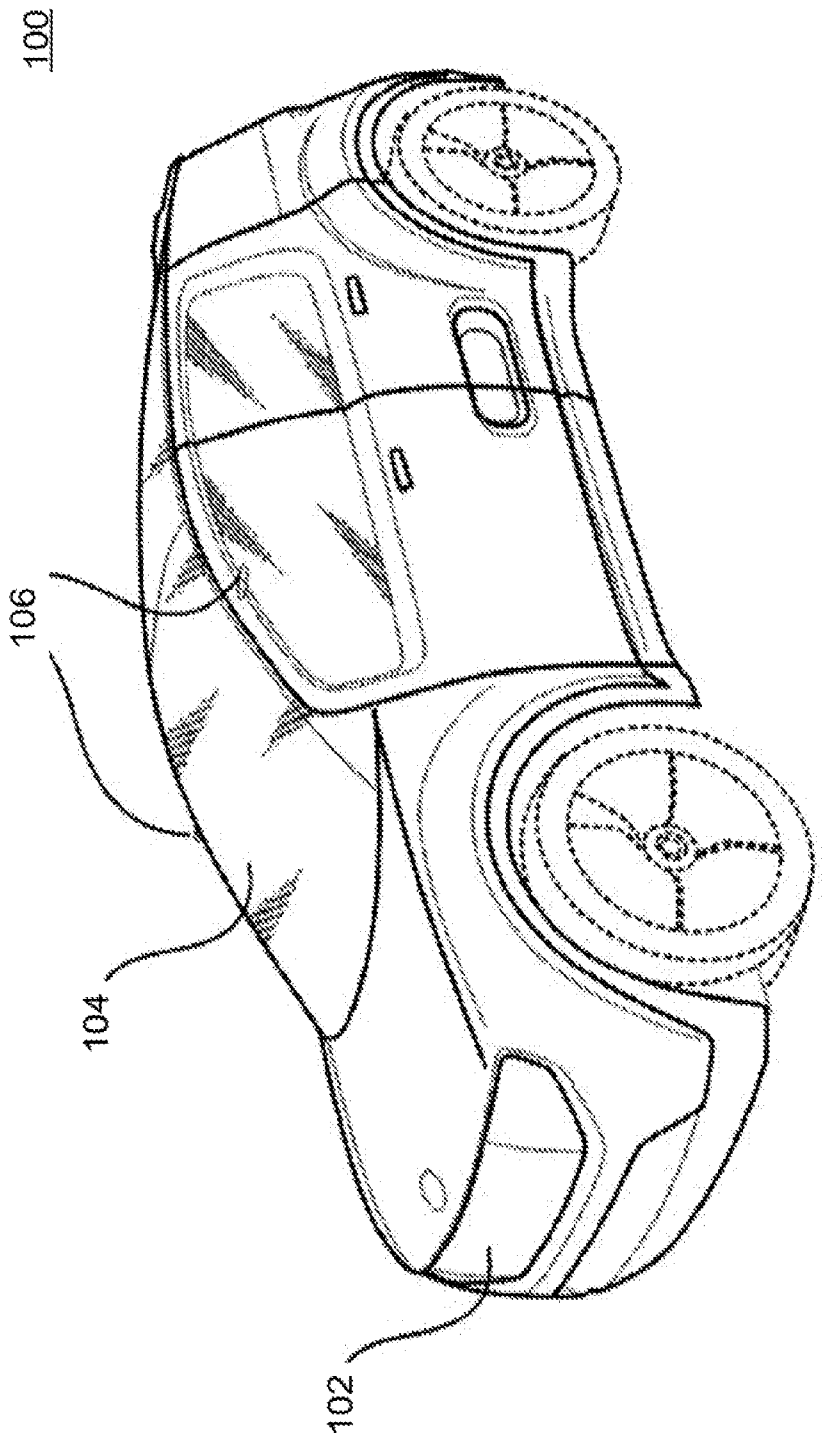

FIG. 1A

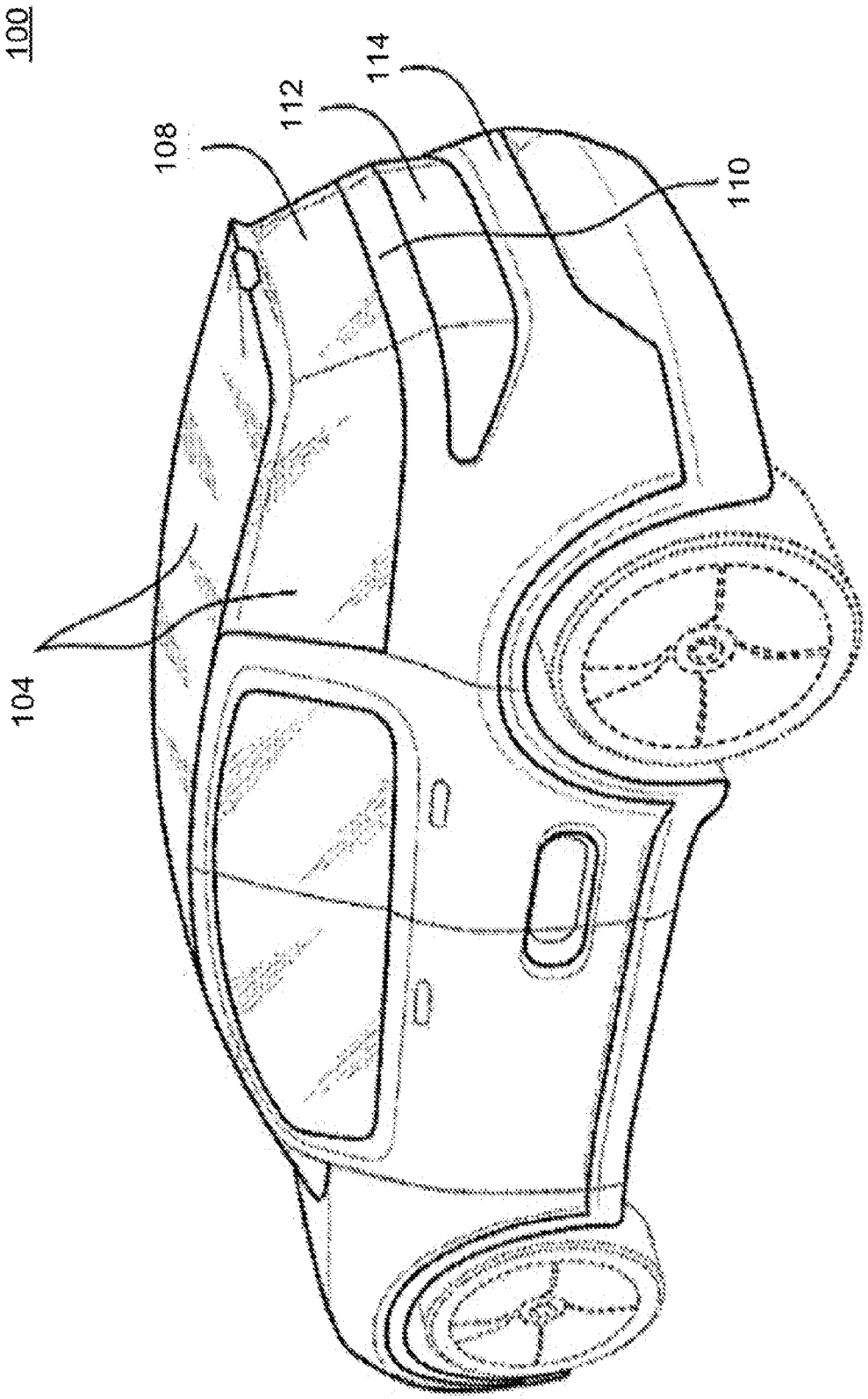

FIG. 1B

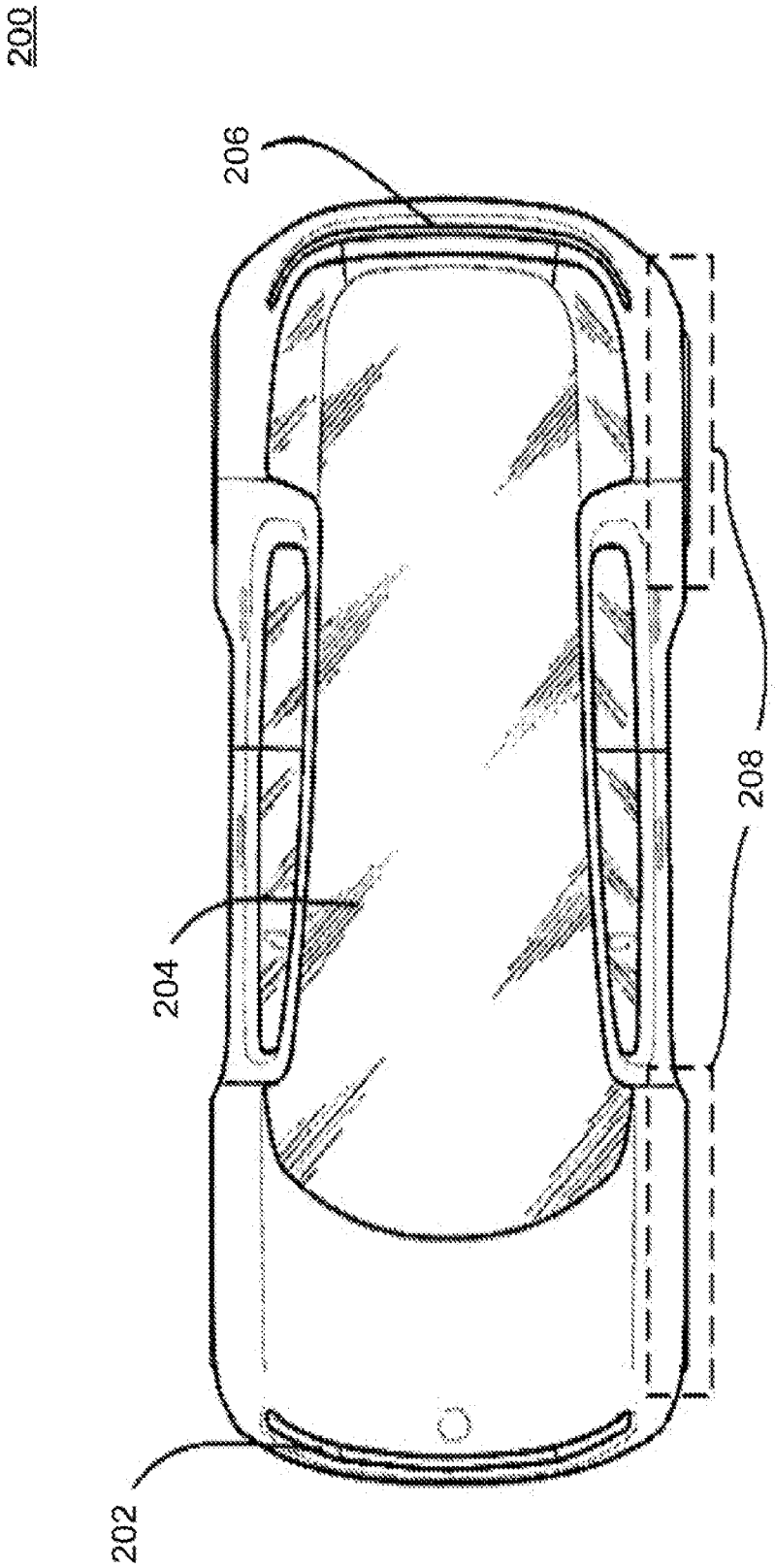

FIG. 2

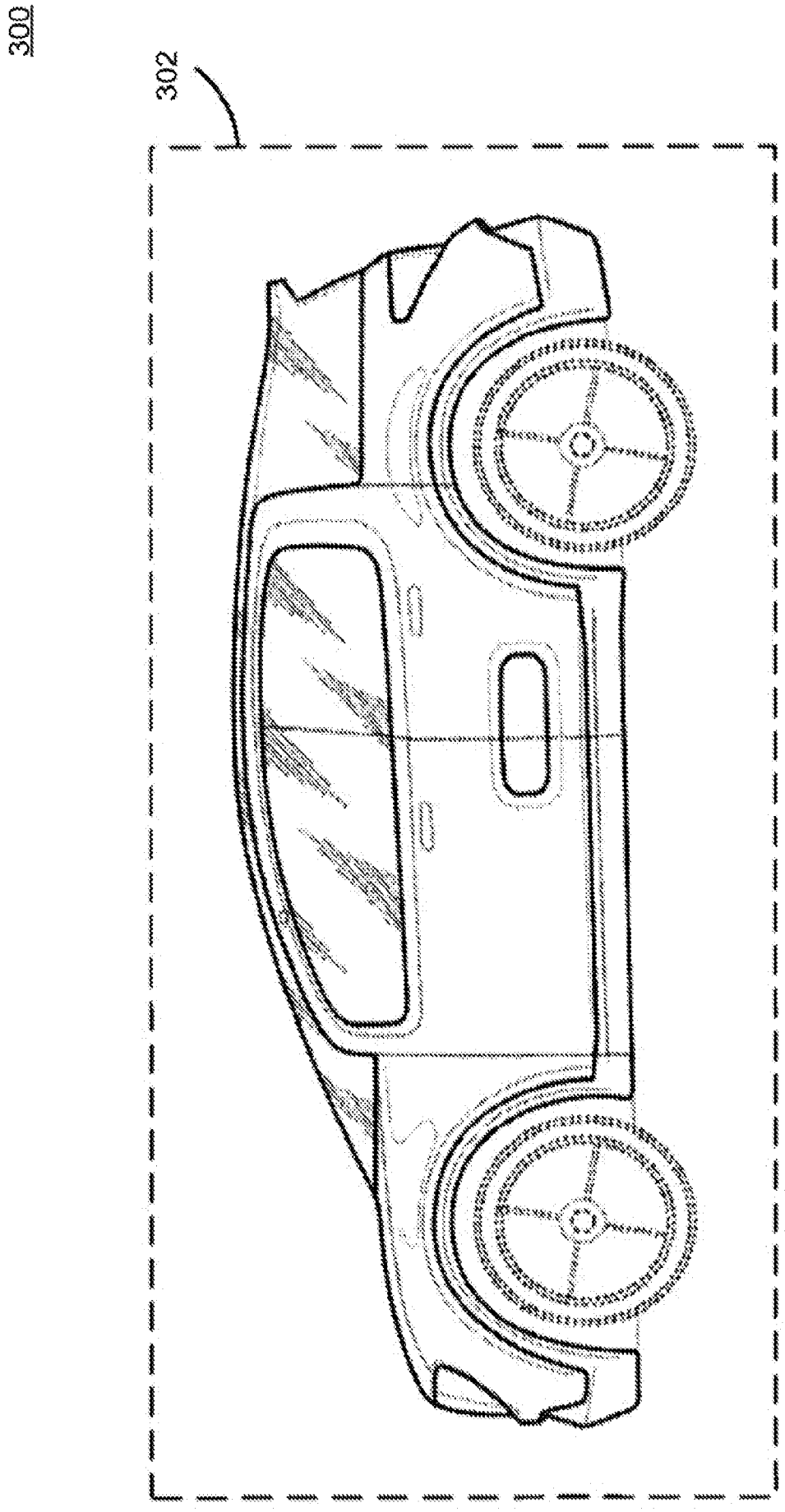

FIG. 3A

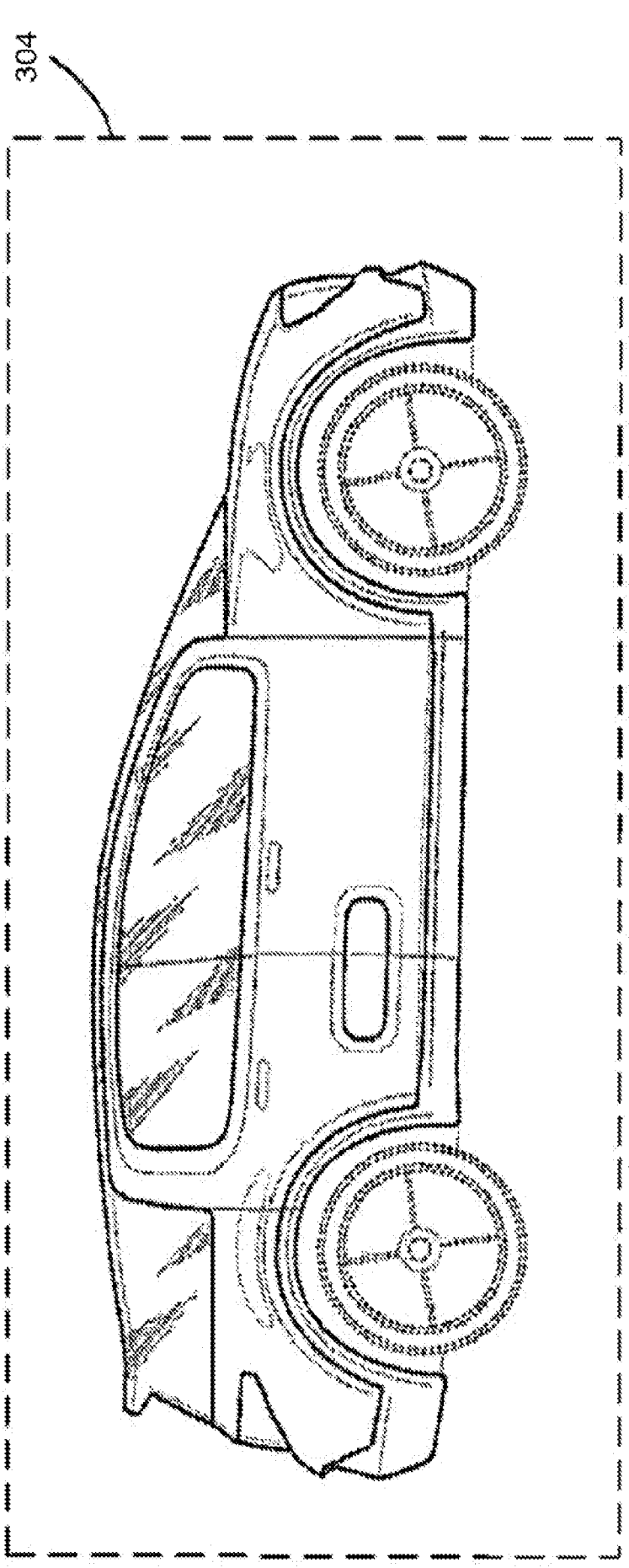

FIG. 3B

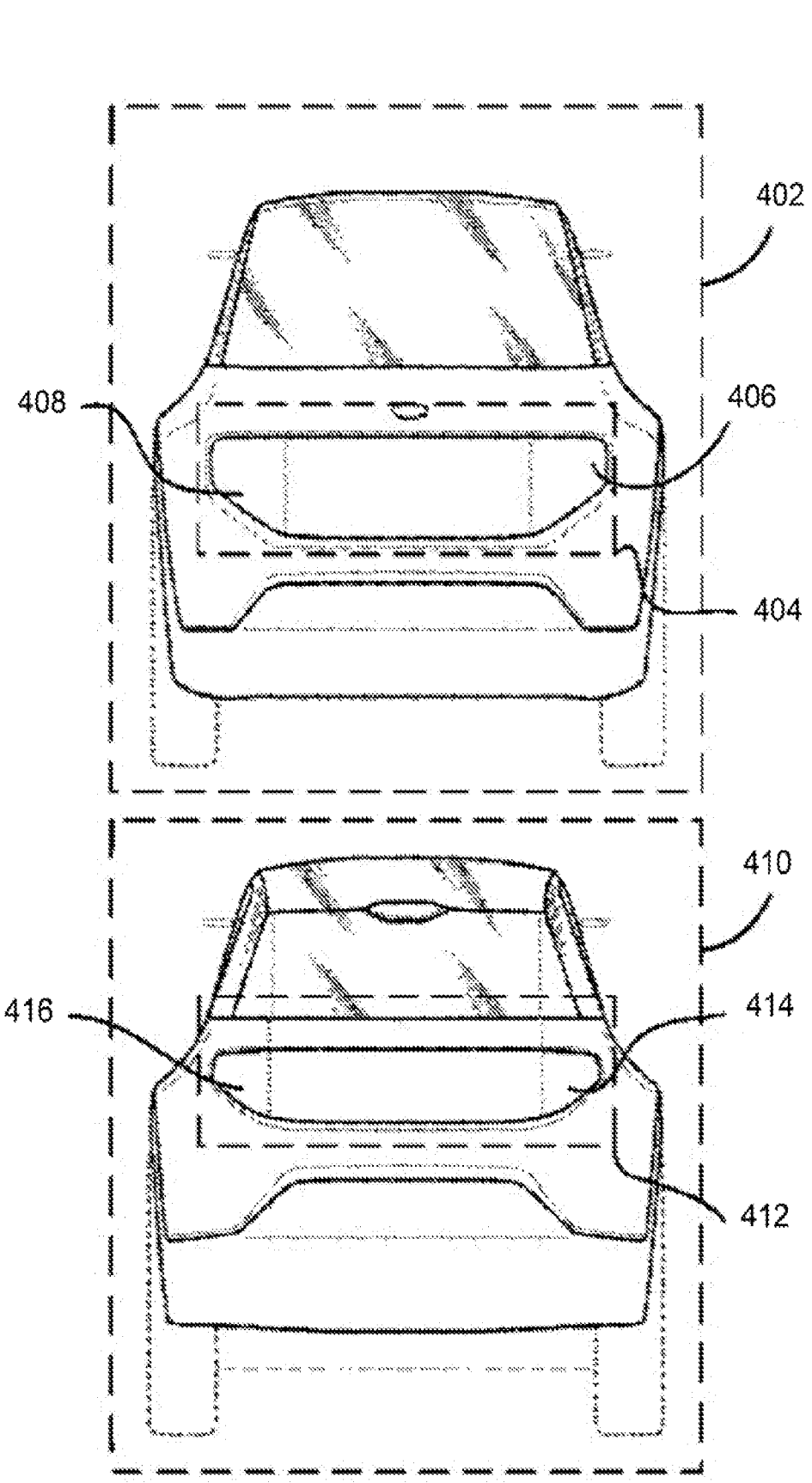

FIG. 4

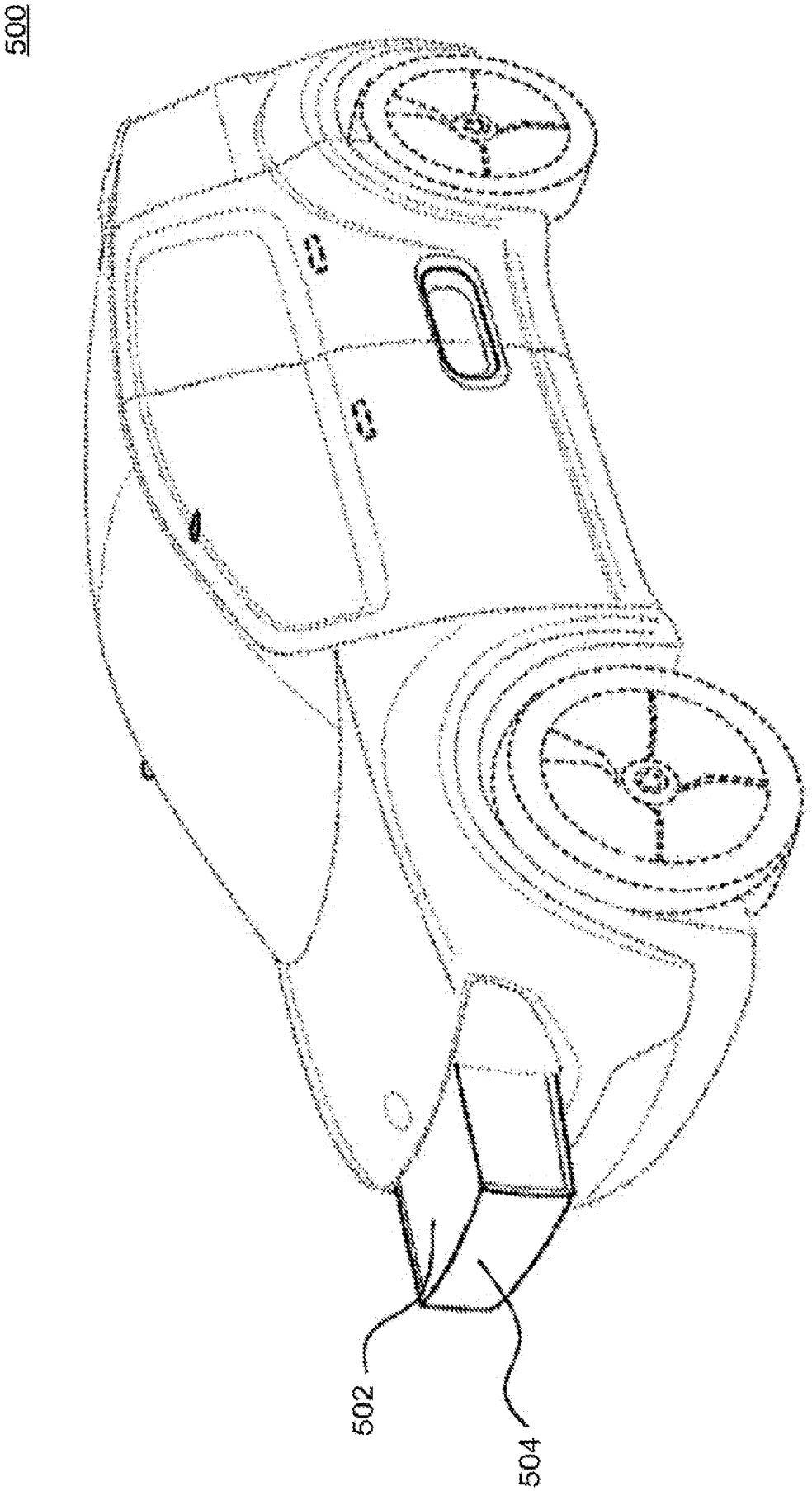

FIG. 5

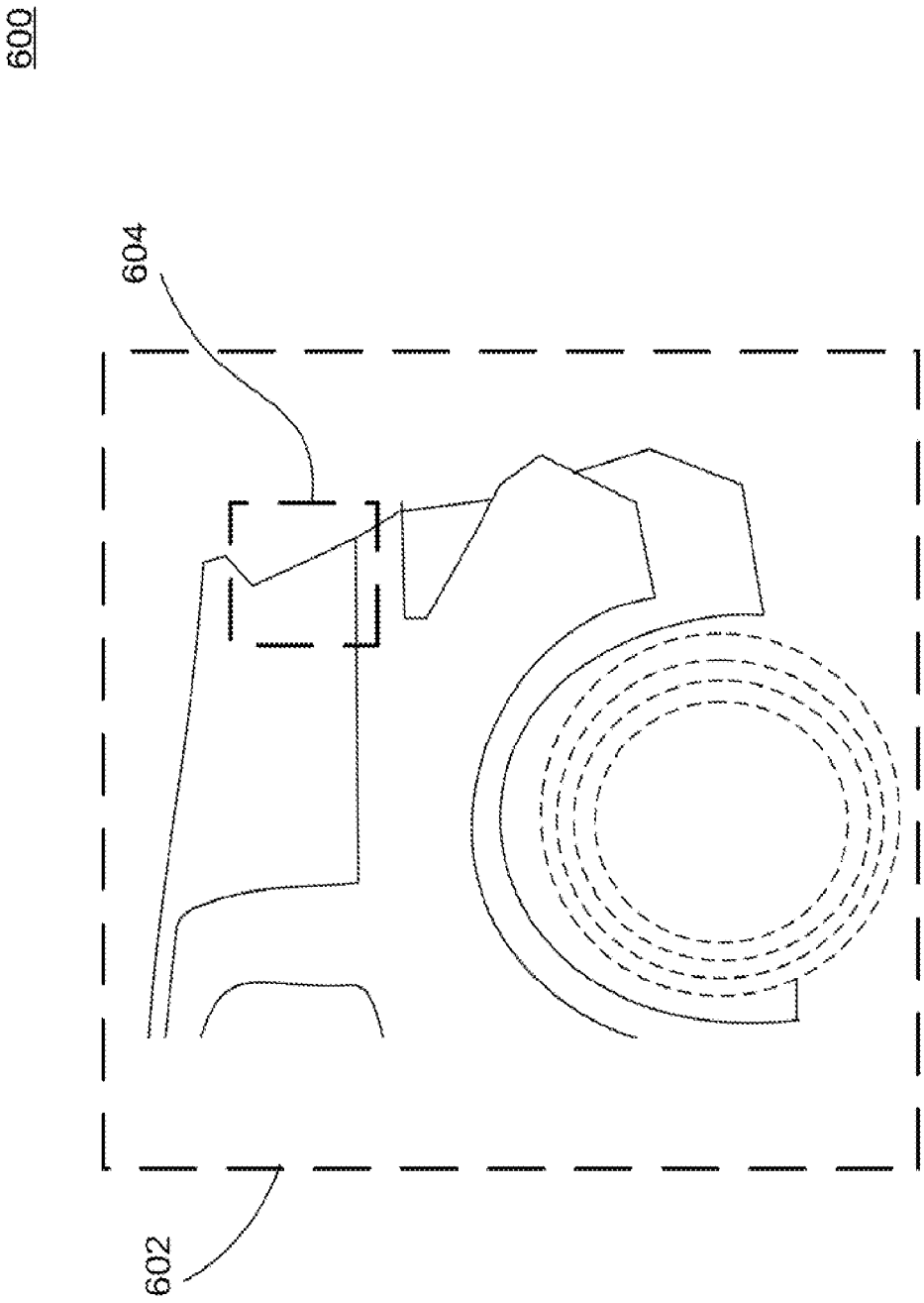

FIG. 6A

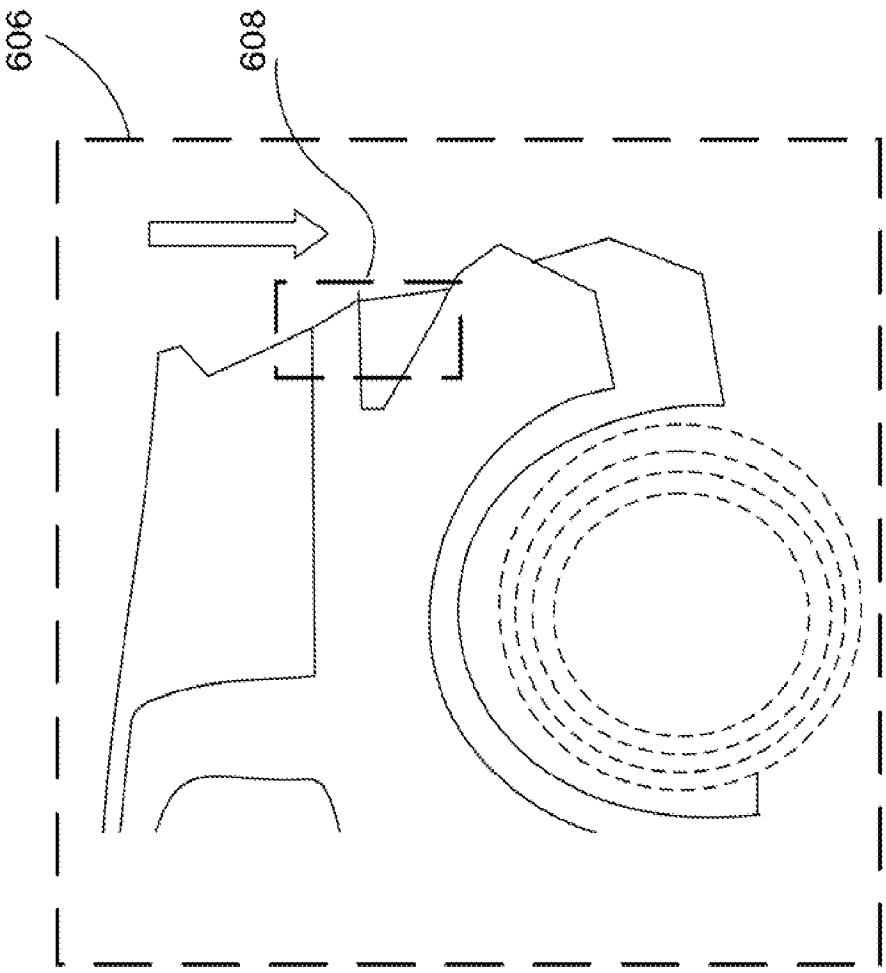

FIG. 6B

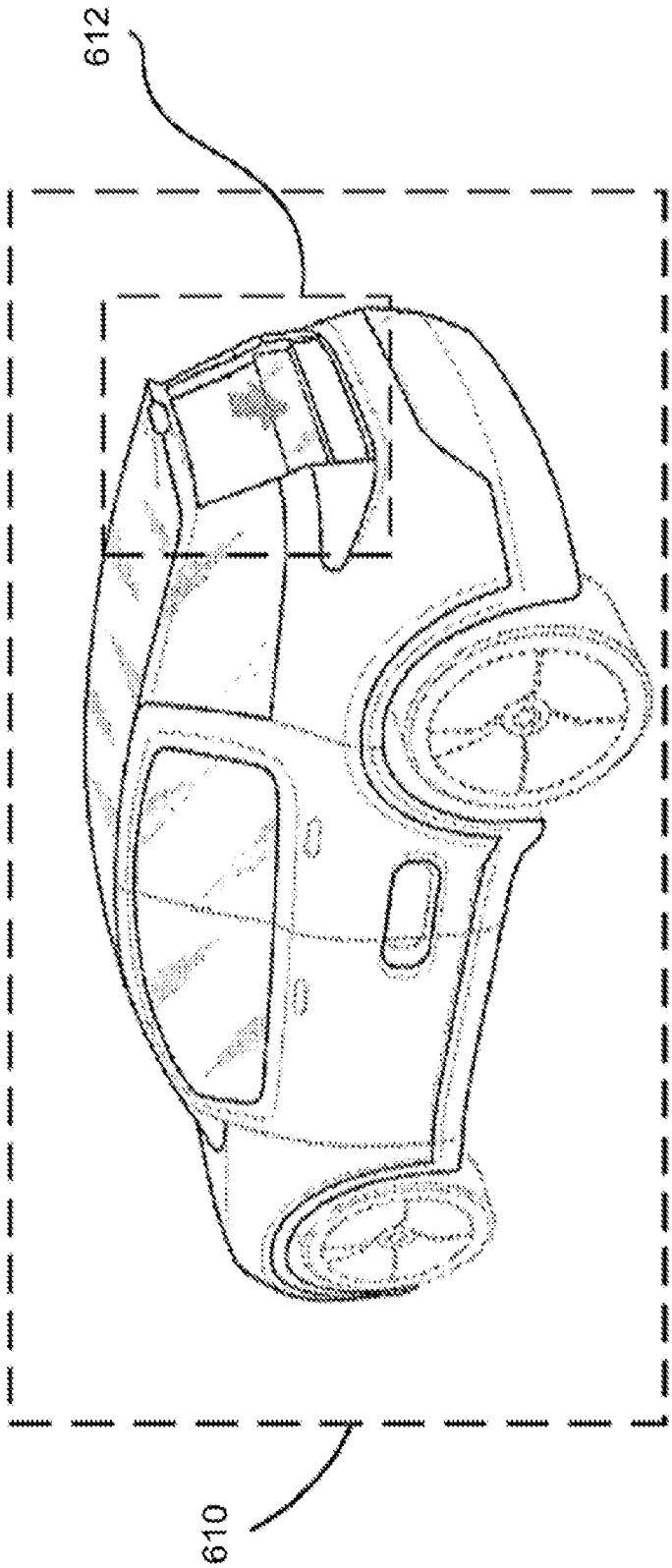

FIG. 6C

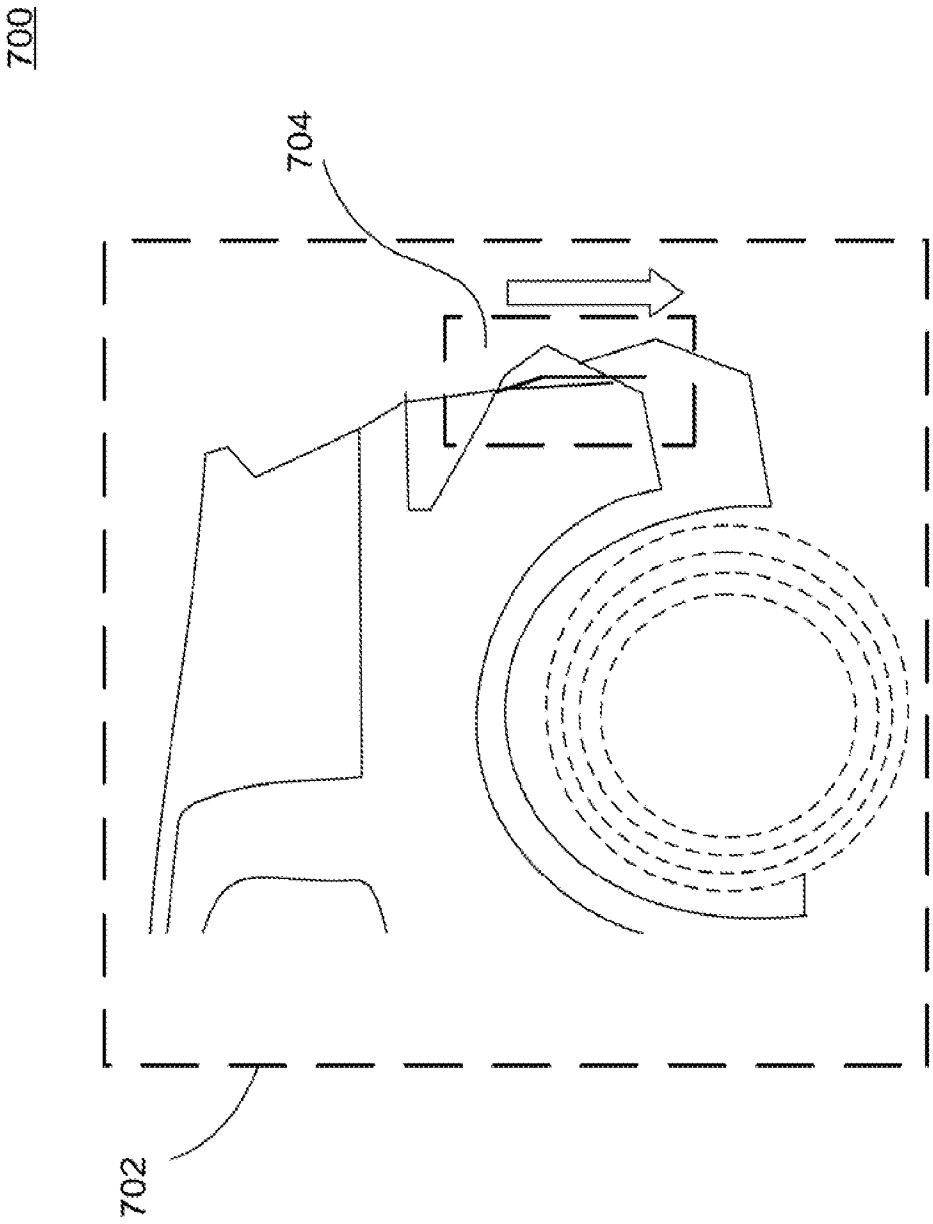

FIG. 7A

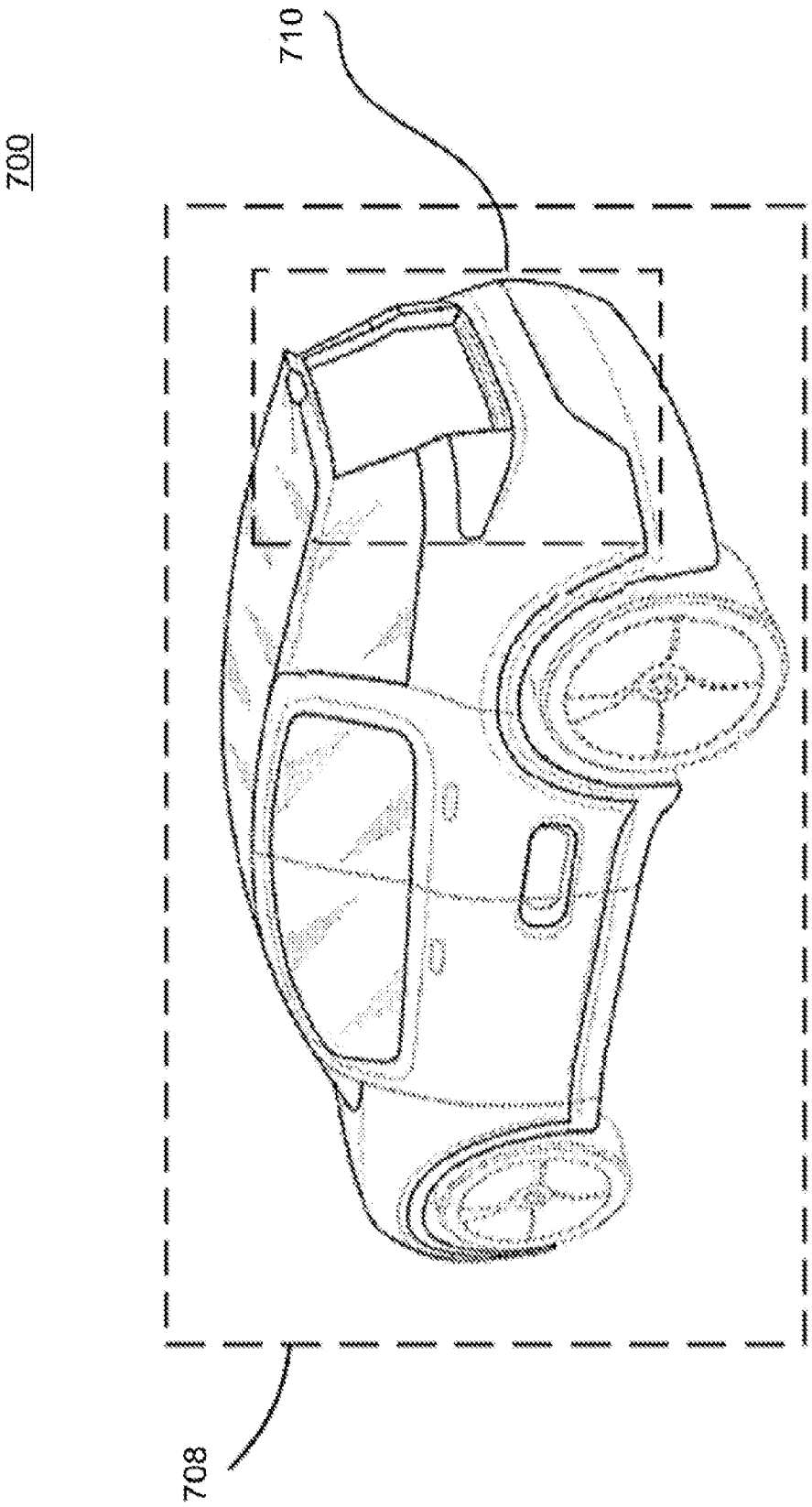

FIG. 7B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 22/21666

A. CLASSIFICATION OF SUBJECT MATTER

IPC - B60R 5/02, B60J 5/10, B60J 5/12, B60Q 1/30 (2022.01)

CPC - B60J 5/101, B60J 1/1861, B60R 5/02, B60J 5/10, B60J 5/12, B60Q 1/30

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2020/0130751 A1 (Ford Global Technologies, LLC) 30 April 2020 (30.04.2020) Entire document especially para [0013]-[0022] and figs. 1-6	12-19 ----- 3-4, 11, 20
Y	FR 2953463 A1 (Peugeot Citroen Automobiles SA) 10 June 2011 (10.06.2011) Entire document especially pages 2-3 and figs. 1-5	1-11, 20
Y	TWM 500706 U (Lin et al.) 11 May 2015 (11.05.2015) Entire document especially page 2 and figs. 1-4	1-11, 20
Y	EP 0989009 B1 (Renault) 29 March 2000 (29.03.2000) Entire document especially para [0018]-[0025], [0035]-[0036] and figs. 1-5	9-10
A	US 2020/0139894 A1 (Ford Global Technologies, LLC) 7 May 2020 (07.05.2020) Entire document	1-20
A	US 2006/0197357 A1 (Catania) 7 September 2006 (07.09.2006) Entire document	1-20
A	US 2020/0130586 A1 (Ford Global Technologies, LLC) 30 April 2020 (30.04.2020) Entire document	1-20
A	US 2020/0001793 A1 (Toyota Motor Engineering & Manufacturing North America, Inc.) 2 January 2020 (02.01.2020) Entire document	1-20

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 May 2022	JUL 12 2022
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Kari Rodriquez Telephone No. PCT Helpdesk: 571-272-4300