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APPARATUS WITH LIGHT FIXTURE

Abstract

An apparatus can include a light fixture. The light fixture can be disposed between a first light of a vehicle and a second light of the vehicle. The light fixture can include a first segment having a first light source and a second segment having a second light source. The first segment can produce light with a first pattern via the first light source. The second segment can produce light with a second pattern via the second light source. The first pattern and the second pattern can indicate a vehicle status of the vehicle.

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Background/Summary

CROSS-REFERENCE TO RELATED PATENT APPLICATIONS [0001] This application claims the benefit of and priority to U.S. Provisional Patent Application No. 63/553,325, filed on Feb. 14, 2024, the entirety of which is incorporated by reference herein.

INTRODUCTION
[0002] Vehicles can include light fixtures to produce light.
SUMMARY
[0003] This disclosure is generally related to one or more components of a vehicle. The components can include at least one apparatus. The apparatus can include at least light fixture. For example, the apparatus can include a first light fixture and a second light fixture. The light fixtures can include one or more light sources. For example, the light fixtures can include Light Emitting Diode (LED) strips. The light sources can produce light having one or more patterns. For example, the light sources can illuminate one or more segments or one or more portions of the light fixture. The light sources can produce light with one or more patterns. For example, the light sources can produce light with a first pattern or a second pattern. The patterns can indicate a vehicle status. For example, a first pattern can include illumination of light from a first segment of the light fixtures to a second segment of the light fixtures to indicate a State of Charge (SoC) of one or more batteries of the vehicle.
[0004] At least one aspect is directed to an apparatus. The apparatus can include a light fixture. The light fixture can be disposed between a first light of a vehicle and a second light of the vehicle. The light fixture can include a first segment having a first light source and a second segment having a second light source. The first segment can produce light with a first pattern via the first light source. The second segment can produce light with a second pattern via the second light source. The first pattern and the second pattern can indicate a vehicle status of the vehicle.
[0005] At least one aspect is directed to a vehicle. The vehicle can include an apparatus. The apparatus can include a light fixture. The light fixture can be disposed between a first light of the vehicle and a second light of the vehicle. The light fixture can include a first segment having a first light source and a second segment having a second light source. The first segment can, responsive to one or more first signals, produce light with a first pattern via the first light source. The second segment can, responsive to one or more second signals, produce light with a second pattern via the second light source. The first pattern and the second pattern can indicate a vehicle status of the vehicle.
[0006] At least one aspect is directed to a method. The method can include disposing a light fixture of an apparatus between a first headlight of a vehicle and a second headlight of the vehicle. The light fixture can include a first segment having a first light source and a second segment having a second light source. The method can also include receiving, by the first segment, one or more first signals to cause the first segment to produce light with a first pattern via the first light source. The method can also include receiving, by the second segment, one or more second signals to cause the second segment to produce light with a second pattern via the second light source. The first pattern and the second pattern can indicate a vehicle status of the vehicle.
[0007] These and other aspects and implementations are discussed in detail below. The foregoing

information and the following detailed description include illustrative examples of various aspects and implementations, and provide an overview or framework for understanding the nature and character of the claimed aspects and implementations. The drawings provide illustration and a further understanding of the various aspects and implementations, and are incorporated in and constitute a part of this specification. The foregoing information and the following detailed description and drawings include illustrative examples and should not be considered as limiting.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The accompanying drawings are not intended to be drawn to scale. Like reference numbers and designations in the various drawings indicate like elements. For purposes of clarity, not every component may be labeled in every drawing. In the drawings:

[0009] FIG. **1** depicts an electric vehicle, in accordance with an implementation.

[0010] FIG. **2** depicts a front view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0011] FIG. **3** depicts a front view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0012] FIG. **4** depicts a front view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0013] FIG. **5** depicts a front view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0014] FIG. **6** depicts a rear view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0015] FIG. **7** depicts a rear view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0016] FIG. **8** depicts a perspective view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0017] FIG. **9** depicts a front view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0018] FIG. **10** depicts a front view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0019] FIG. **11**A depicts a front view of the vehicle illustrated in FIG. **1** including an apparatus, in accordance with an implementation.

[0020] FIG. **11**B depicts an internal view of a cabin of the vehicle illustrated in FIG. **1**, in accordance with an implementation.

[0021] FIG. **12** depicts a flow diagram of a process to manufacture an apparatus, in accordance with an implementation.

[0022] FIG. **13** is a block diagram illustrating an architecture for a computer system that can be employed to implement elements of the systems and methods described and illustrated herein.

DETAILED DESCRIPTION

[0023] Following below are more detailed descriptions of various concepts related to, and implementations of, methods, apparatuses, and systems of an apparatus having one or more light fixtures to indicate one or more vehicle statuses of a vehicle. The various concepts introduced above and discussed in greater detail below may be implemented in any of numerous ways.

[0024] The present disclosure is directed to systems and methods of one or more components for a vehicle. The components can include an apparatus. The apparatus can include one or more light fixtures including light sources to produce light having one or more patterns. For example, the light sources can illuminate one or more segments of an apparatus to indicate a vehicle status. As

another example, the light sources can produce light that originates at a first point of a vehicle. The light fixture can include one or more segments. For example, the light fixture can include a first segment and a second segment. The segments can receive one or more instructions. For example, the segments can receive instructions to illuminate the light sources. As another example, the segments can receive instructions to halt a production of light.

[0025] The disclosed solutions have a technical advantage of providing the apparatus that includes the light fixture to dispose between one or more lights of a vehicle (e.g., headlights, side lights, rear lights, cabin lights, interior lights, exterior lights, or any other vehicle lights or combinations thereof) to provide one or more vehicle statuses without an operator of the vehicle having to enter into the vehicle. For example, the vehicle can detect a presence of an operator of the vehicle and the vehicle can control the light sources to produce light without the operator within the vehicle. Systems and methods of the present technical solution also include providing light fixture with the light sources to receive one or more instructions. The instructions can define or dictate one or more patterns produced by the light sources and as such can provide an operator with flexibility or modularity as to light patterns that can be produced by the light sources.

[0026] FIG. **1** depicts an example cross-sectional view **100** of an electric vehicle **105** installed with at least one battery pack **110**. Electric vehicles **105** can include electric trucks, electric sport utility vehicles (SUVs), electric delivery vans, electric automobiles, electric cars, electric motorcycles, electric scooters, electric passenger vehicles, electric passenger or commercial trucks, hybrid vehicles, or other vehicles such as sea or air transport vehicles, planes, helicopters, submarines, boats, or drones, among other possibilities. The battery pack **110** can also be used as an energy storage system to power a building, such as a residential home or commercial building. Electric vehicles **105** can be fully electric or partially electric (e.g., plug-in hybrid) and further, electric vehicles **105** can be fully autonomous, partially autonomous, or unmanned. Electric vehicles **105** can also be human operated or non-autonomous. Electric vehicles **105** such as electric trucks or automobiles can include on-board battery packs **110**, batteries **115** or battery modules **115**, or battery cells **120** to power the electric vehicles. The electric vehicle **105** can include a chassis **125** (e.g., a frame, internal frame, or support structure). The chassis **125** can support various components of the electric vehicle **105**. The chassis **125** can span a front portion **130** (e.g., a hood or bonnet portion), a body portion **135**, and a rear portion **140** (e.g., a trunk, payload, or boot portion) of the electric vehicle **105**. The battery pack **110** can be installed or placed within the electric vehicle **105**. For example, the battery pack **110** can be installed on the chassis **125** of the electric vehicle **105** within one or more of the front portion **130**, the body portion **135**, or the rear portion **140**. The battery pack **110** can include or connect with at least one busbar, e.g., a current collector element. For example, the first busbar **145** and the second busbar **150** can include electrically conductive material to connect or otherwise electrically couple the battery **115**, the battery modules **115**, or the battery cells **120** with other electrical components of the electric vehicle **105** to provide electrical power to various systems or components of the electric vehicle **105**.

[0027] FIG. **2** depicts a perspective view of the vehicle **105**. The vehicle **105** can include an apparatus **200**, at least one lightbar **210**, at least one light **215**, at least one headlight **220**, at least one charging cord **225**, and at least one mirror **227**. For example, the apparatus **200** can be included in a front panel of the vehicle **105**. As another example, the apparatus **200** can be included in a rear panel of the vehicle **105**. As even another example, the apparatus **200** can be included in a door of the vehicle **105**. The vehicle **105** or one or more components thereof can define and/or establish one or more sections or portions. For example, as shown in FIG. **2**, the vehicle **105** can define a section **230**, a section **235**, and a section **240**. To continue this example, the section **230** can refer to or include a left section, the section **235** can refer to or include a middle section or center point, and the section **240** can refer to or include a right section.

[0028] The apparatus **200** can include at least one light fixture **203**. The light fixture **203** can

include at least one segment **205** or section **205**. For example, the light fixture **203** can include a first segment **205** and a second segment **205**. The segments **205** can include at least one light source **207**. For example, the segments **205** can include LED strips. The light fixture **203** can be included with the vehicle **105**. For example, the light fixture **203** can be disposed between a first headlight **220** and a second headlight **220**. To continue this example, the light fixture **203** can be located, positioned, and/or placed between the headlights **220** to dispose the light fixture **203** between the headlights **220**.

[0029] The segments **205** can receive one or more signals (e.g., instructions or a provision of electrical power). For example, the segments **205** can receive signals from a controller of the vehicle **105**. As another example, the segments **205** can receive signals from an infotainment system of the vehicle **105**. As shown in FIG. **2**, the light fixture **203** is shown to include ten segments **205**. However, the light fixture **203** can include different numbers of segments **205**. For example, the light fixture **203** can include five segments **205**. As another example, the light fixture **203** can include 11 segments **205**.

[0030] A controller (e.g., a processor and memory) can send one or more signals or instructions to the segments **205**. For example, the controller can send a first signal to a first segment **205** and a second segment **205**. The signals can be the same signals or different signals. The signals can include multiple signals. For example, the controller can send one or more first signals to a first segment **205** and the controller can send one or more second signals to a second segment **205**. The signals can control the light sources **207**. For example, the controller can send a first signal to cause the light source **207** to produce light. As another example, the controller can pause the first signal or send a second signal to cause the light source to stop the production of light. The signals or instructions described herein can include control signals (e.g., a signal to turn on, a signal to turn off, etc.) The signals or instructions can also include transmission of electrical current, electrical voltage, or electrical power that, when received by the light fixture **203**, causes the light fixture **203** to produce light.

[0031] The segments **205** can receive one or more instructions to cause the light sources **207** to produce light. For example, a first segment **205** can receive a first instruction and a second segment **205** can receive a second instruction. The first instruction and the second instruction can be the same instruction or different instructions. For example, the first segment **205** and the second segment **205** can receive the same signal or different signals. The instructions can cause the light sources **207** to produce light. For example, the first segment **205** can receive a first instruction to cause a first light source **207** to produce light. To continue this example, the first instruction can cause the first segment **205** to activate (e.g., turn on) the first light source **207** to produce light. Stated otherwise, the first instruction can cause the first segment **205** to provide power to the first light source **207** to cause the first light source **207** to produce light.

[0032] The light sources **207** can produce light having one or more patterns. For example, a first light source **207** can produce light with a first pattern and a second light source **207** can produce light with a second pattern. As another example, one or more light sources **207** can produce light with one or more patterns. As even another example, the first light source **207** and the second light source **207** can produce a third pattern. To continue this example, the first segment **205** and the second segment **205** can receive a similar instruction (e.g., a third instruction) which can cause the first light source **207** and the second light source **207** to produce a similar pattern (e.g., the third pattern). The patterns can include at least one of a brightness of light produced, a direction of the light, strobing lights, colored lights, flashing lights, pulsing lights, a flow of light, or other possible patterns. For example, a first pattern can include light traveling from the section **230** to the section **235**. To continue this example, the light can travel along one or more segments **205** (e.g., light can begin at a first segment **205** and travel to one or more second segments **205**). As described herein, light traveling can include a production of light by a first light source **207** at a first point in time, a production of light by a second light source **207** at a second point in time, and a halt in the

production of light by the first light source **207** at the second point in time. The production of light by the first light source **207** and the production of light by the second light source **207** can give an appearance or a look of light traveling from a first segment **205** to a second segment **205**. As another example, production of light can originate at one or more segments **205** and then travel or move to one or more second segments by turning on or off one or more light sources **207**.

[0033] The patterns can indicate one or more statuses. For example, the patterns can include a vehicle status. The vehicle status can include at least one of a state of charge (SoC) of the batteries **115**, a charging status of the batteries **115**, an autonomous drive mode of the vehicle **105**, a predetermined color pattern, an unlocked state of the vehicle **105**, or a locked state of the vehicle. For example, the light sources **207** can turn on and off to create an appearance of light traveling from a leftmost light source **207** to a rightmost light source **207**. As another example, the ten light sources **207** (as shown in FIG. **2** can each represent 10 percent battery charge). To continue this example, illumination of a first leftmost light source **207** and a second leftmost light source **207** can indicate that the batteries **115** have a SoC of 20 percent. To continue this example, the light sources **207** can produce light to travel, while illuminating the first leftmost light source **207** and the second leftmost light source **207**, from the first leftmost light source **207** to a rightmost light source **207** to indicate that the batteries **115** are charging.

[0034] While some example, described herein have included light traveling in one or more directions, these example are not limiting in any way. For example, light can travel from (e.g., originate) from one or more points along the vehicle **105** and travel to one or more second points along the vehicle **105**.

[0035] The segments **205** can receive the instructions responsive to a detection of at least one of a fob of the vehicle, a key of the vehicle, a user device associated with the vehicle, or a selection of a selectable element displayed on a user interface. For example, the first segment **205** can receive a first instructions responsive to a computing device of the vehicle **105** detecting a fob of the vehicle **105** (e.g., the fob is within a given range or geofence of the vehicle **105**). As another example, the first segment **205** can receive a first instruction responsive to a computing device of the vehicle **105** receiving a signal to unlock the vehicle **105**. As even another example, the first segment **205** can receive a first instruction responsive to a computing device of the vehicle **105** detecting a selection of a lock vehicle button on a user interface.

[0036] The light sources **207** can produce light at one or more points in time. For example, a first light source **207** can produce light with a first pattern at a first point in time. To continue this example, the first light source **207** can produce light with a second pattern at a second point in time. The light sources **207** can be controlled together or separately. For example, the light segments **205** can receive an instruction which cause the light sources **207** to produce light having a first pattern. As another example, the segments **205** can receive a first instruction and a second instructions which caused the light sources **207** to produce light with different patterns. As even another example, a first light source can produce light with the first pattern at a first point in time can produce light with the second pattern at a second point in time (e.g., at different points in time).

[0037] The patterns can include light traveling from one or more points of the vehicle **105**. For example, the first pattern can include light traveling from a first point of the vehicle **105** to a second point of the vehicle **105**. Light traveling from the first point of the vehicle **105** can include light traveling from a portion of the vehicle proximate to at least one of the sections (e.g., the section **230**, the section **235**, or the section **240**). For example, light can originate a leftmost portion of a first segment **205** and travel to a rightmost portion of the first segment **205**. As another example, light can originate at a center segment **205** and travel to one or more of a leftmost segment **205** and a rightmost segment **205** (e.g., a lateral point of the vehicle **105**).

[0038] The light sources **207** can produce light having one or more colors. For example, the first light source **207** can include a Red Green Blue (RGB) LED that can produce light having one or more colors. As another example, the first light source **207** can produce light that includes a red

color (e.g., a first color) and the second light source **207** can produce light that includes a green color (e.g., a second color). The light sources **207** can produce light having one or more colors based on the instructions received by the segments **205**. For example, a first instruction can include information to cause the first light source **207** to produce light with a blue color and the second instruction can include information to cause the second light source **207** to produce light with a yellow color. The light sources **207** can produce light that has a color different than a color of light produced by the headlights **220**. For example, the headlights **220** can produce light having a white color and the light sources **207** can produce light having a blue color (e.g., a color different than white).

[0039] FIGS. **3**, **4**, and **5** depict front views of the vehicle **105**. The vehicle **105** can include apparatus **200**. For example, the apparatus **200** is shown to be included in a front panel of the vehicle **105**. As shown in FIG. **3**, relative to FIG. **2**, light produced by the light sources **207** is shown to have traveled from a center point of the vehicle to a lateral point of the vehicle **105** (e.g., light started at a center of the vehicle and traveled outwards).

[0040] FIG. **4** depicts an example of the light sources **207** producing light to indicate an SoC of the batteries **115**. For example, a second leftmost light source **207** is shown to be producing light with a brightness that is less than or different than the other six light sources **207** that are shown to be producing light. In this example, the second leftmost light source **207** having light with a different brightness can indicate that the batteries **115** have a SoC of 20 percent. To continue this example, light flowing from a first leftmost light source **207** to a rightmost light source **207** can indicate that the batteries **115** are being charged.

[0041] The charging cord **225** can include at least one light fixture **405**. The light fixtures **405** can include the light fixture **203**. For example, the light fixtures **405** can include the light sources **207**. The light fixtures **405** can at least partially surround an external surface of the charging cord **225**. For example, the light fixture **405** can be disposed on the external surface of the charging cord **225** and the light fixture can extend along the external surface of the charging cord. The light fixtures **405** can include the segments **205**. For example, the light fixtures **405** can include a first segment **205** and a second segments **205**. The segments **205** can receive instructions to cause the light sources **207** of the light fixtures **405** to produce light with one or more patterns. The light produced by the light sources **207** of the light fixtures **405** can match and/or coordinate with light produced by the light sources **207** of the light fixture **203**. For example, light sources **207** of the light fixture **405** can produce light with a pattern that matches a pattern of light produced by the light sources **207** of the light fixture **203**.

[0042] FIGS. **6** and **7** depict rear views of the vehicle **105**. The vehicle **105** can include the apparatus **200**. For example, the apparatus **200** can be included in a rear gate of the vehicle. As another example, the vehicle **105** can include a first apparatus **200** included in a front panel of the vehicle **105** and a second apparatus **200** included in the rear gate of the vehicle **105**. The second apparatus **200** can include a second light fixture **203** disposed between one or more rear lights of the vehicle **105**. For example, the second light fixture **203** can be disposed between a first rear light **605** and a second rear light **605**. The rear lights **605** of the vehicle **105** can include at least one of a rear lightbar, brake lights, or flashers. The second light fixture **203** can include one or more segments **205**. The segments **205** can receive one or more instructions. For example, a light fixture **203** disposed in a front panel of the vehicle **105** and a light fixture **203** disposed in a rear gate of the vehicle **105** can receive similar instructions. The light fixtures **203** receiving similar instructions can cause the light sources **207**, located at the front of the vehicle **105**, to produce light with a pattern that is similar to light produced by light sources **207** located at the rear of the vehicle.

[0043] FIG. **8** depicts a perspective view of the vehicle **105**. The vehicle **105** can include a port or slot to receive the charging cord **225**. For example, the port can include one or more openings to receive one or prongs of the charging cord **225**. The vehicle **105** can include the light fixture **405**. For example, the light fixture **405** can be coupled with a panel of the vehicle. As another example,

a charging compartment of the vehicle **105** can include the light fixture **405**.
[0044] FIG. **9** depicts a front view of the vehicle **105**. FIG. **9** depicts an example of the light sources **207** producing light originating from a center point of the vehicle **105**. As shown in FIG. **9**, the lights **215** are producing light in unison with the light sources **207** (e.g., the lights **215** and the light sources **207** are producing light at the same time). The light produced by the light sources **207** and the light produced by the lights **215** can be different. For example, the light sources **207** and the lights **215** can produce light having different colors. As another example, the light sources **207** and the lights **215** can produce light with different colors to indicate one or more vehicle statuses. The lights **215** can include turn signals or blinkers. For example, a first light **215** can flash or illuminate to indicate a change in direction of the vehicle **105** (e.g., indicate that the vehicle **105** is turning left or turning right).
[0045] The light pattern shown in FIG. **9** can be initiated responsive to detection of a key fob of the vehicle **105**. The light pattern shown in FIG. **9** can refer to or include a welcome or greeting pattern (e.g., a light pattern that is produced as an operator of the vehicle **105** approaches the vehicle **105**). The light pattern shown in FIG. **9** can also refer to or include a departure or exit pattern (e.g., a light pattern that is produced as an operator the vehicle **105** departs or moves away from the vehicle **105**).
[0046] FIG. **10** depicts a front view of the vehicle **105**. FIG. **10** depicts an example of the light sources **207** producing light in unison with the lightbar **210** and the headlights **220**. For example, the light pattern, as shown in FIG. **10**, can be a continuation or a transition from the light pattern shown in FIG. **9**. Stated otherwise, the light pattern, as shown in FIG. **9**, can occur at a first point in time and the light pattern, as shown in FIG. **10**, can occur at a second point in time that is subsequent to the first point in time (e.g., after). As shown in FIG. **10**, relative to FIG. **9**, the mirrors **227** have moved from a stowed or closed position to a deployed or open position. The movement of the mirrors **227** (e.g., from the stowed to the deployed position) can occur in unison with the light pattern shown in FIG. **9** or FIG. **10**. For example, as the lights sources **207** begin to produce the light pattern, as shown in FIG. **9**, the mirrors **227** can begin to move from the collapsed position, as shown in FIG. **9**, to the deployed position as shown in FIG. **10**.
[0047] FIG. **11**A depicts a front view of the vehicle **105**. The vehicle **105** can include at least one accessory **1105** or device **1105**. For example, the accessories **1105** can be provided with the vehicle **105**. As another example, the accessories **1105** can pair with or connect to the vehicle **105**. The accessory **1105** is shown as a speaker in FIG. **11**. The accessory **1105** can communicate with the light fixture **203**. For example, the accessory **1105** and the light fixture **203** can transmit one or more signals to one another. As another example, the accessory **1105** can receive one or more instructions similar to instructions received by the light fixture **203**. The light sources **207** can produce light patterns to align with or correspond to aspect of the accessory **1105**. For example, the light sources **207** can produce light patterns to align with music that is emitted or produced by the accessory **1105**. FIG. **11** depicts an example of the light sources **207** producing light with a light pattern that aligns with the accessory **1105**. The light pattern, as shown in FIG. **11**, can refer to or include a music mode or a music pattern.
[0048] The light patterns described herein can refer to or include at least one of a camp mode, a night vision mode, an alarm mode, a roadside mode, an autonomous driving mode, one or more easter eggs (e.g., lights that correspond to one or more cultural references), a Halloween mode, a holiday mode, a camp speaker mode, a first responder mode, a service mode, a software update mode, a plugged in mode, or a turn signal mode.
[0049] The light patterns can be updated, adjusted, modified, or changed. For example, the light patterns can be updated by one or more over the air (OTA) updates. The OTA updates can include replacing, adding, removing, updating, adjusting, changing, combining, or modifying the light patterns. For example, prior to an OTA update the light sources **207** can produce light having red and green flashing light. To continue this example, the light sources **207** can produce light having

purple and orange flashing lights based on the OTA update. As another example, the apparatus **200** or the vehicle **105** can include memory and/or more processors. To continue this example, the memory can store at least one light pattern and/or instructions to cause the light sources **207** to produce light with the light patterns.

[0050] The memory and processor can receive at least one over the air (OTA) update to update, adjust, modify, or change the light patterns stored in the memory. For example, prior to an OTA update the memory can maintain one or more first light patterns associated with a first holiday. To continue this example, the memory can, after the OTA update, maintain one or more second light patterns associated with a second holiday. Stated otherwise, the OTA update can replace the first light patterns with the second light patterns.

[0051] FIG. **11**B depicts an internal view of a cabin **1110** of the vehicle **105**. The cabin **1110** can include at least one display **1115** or screen **1115**. For example, the cabin **1110** can include a first display **1115** that is housed behind a steering wheel of the vehicle **105**. As another example, the cabin **1110** can include a second display **1115** that represents or houses an infotainment system of the vehicle **105**. The cabin **1110** can include at least one dash **1120** or compartment **1120**. The cabin **1110** can include the light sources **207**. For example, a first light source **207** can be disposed proximate to or within the dash **1120**. As another example, a second light source **207** can be disposed proximate to the infotainment system (e.g., the second display **1115**). As another example, a third light source **207** can be disposed proximate to the steering wheel or the first display **1115**. The light sources **207** can produce light to indicate a temperature or a temperature setting of the vehicle **105**. For example, the light source **207** can produce light with a blue color to indicate that an air conditioning unit of the vehicle **105** is providing air **1120** that is cooled within the cabin **1110**. As another example, the light sources **207** can produce light with a red color to indicate that a heating system of the vehicle **105** is providing air **1120** that is heated within the cabin **1110**.

[0052] FIG. **12** depicts a flow diagram of a process **1200** to manufacture an apparatus. The apparatus can include the apparatus **200**. The apparatus **200** can include the light fixture **203**. The apparatus **200** can be provided with or included with the vehicle **105**. At act **1205**, a light fixture can be disposed. For example, the light fixture **203** can be disposed between a first headlight **220** and a second headlight **220**. The light fixture **203** can be disposed between the headlights by at least one of placing, locating, positioning, or otherwise situating the light fixture **203** between the headlights **220**. For example, the light fixture **203** can be disposed in a front panel of the vehicle **105**. The light fixture **203** can include the segments **205**. The segments **205** can include the light sources **207**. For example, a first segment **205** can include a first light source **207** and a second segment **205** can include a second light source **207**.

[0053] At act **1210**, one or more first signals can be received. For example, the first segment **205** can receive the one or more first signals. The one or more first signals can be instructions to cause a production of light. For example, the one or more first signals can cause the first light source **207** to produce light with a first pattern. At act **1215**, one or more second signals can be received. For example, the second segment **205** can receive the one or more second signals. The one or more second signals instructions to produce light. For example, the one or more second signals can cause the second light source **207** to produce light with a second pattern. The first pattern and the second pattern can indicate a vehicle status of the vehicle **105**. For example, the first pattern and the second pattern can indicate a SoC of the batteries **115** of the vehicle **105**. As another example, the first pattern and the second pattern can indicate a drive mode of the vehicle **105**.

[0054] FIG. **13** depicts an example block diagram of an example computer system **1300**. The computer system or computing device **1300** can include or be used to implement a data processing system or its components. The computing system **1300** includes at least one bus **1305** or other communication component for communicating information and at least one processor **1310** or processing circuit coupled to the bus **1305** for processing information. The computing system **1300** can also include one or more processors **1310** or processing circuits coupled to the bus for

processing information. The computing system **1300** also includes at least one main memory **1315**, such as a random access memory (RAM) or other dynamic storage device, coupled to the bus **1305** for storing information, and instructions to be executed by the processor **1310**. The main memory **1315** can be used for storing information during execution of instructions by the processor **1310**. The computing system **1300** may further include at least one read only memory (ROM) **1320** or other static storage device coupled to the bus **1305** for storing static information and instructions for the processor **1310**. A storage device **1325**, such as a solid state device, magnetic disk or optical disk, can be coupled to the bus **1305** to persistently store information and instructions.

[0055] The computing system **1300** may be coupled via the bus **1305** to a display **1335**, such as a liquid crystal display, or active matrix display, for displaying information to a user such as a driver of the electric vehicle **105** or other end user. An input device **1330**, such as a keyboard or voice interface may be coupled to the bus **1305** for communicating information and commands to the processor **1310**. The input device **1330** can include a touch screen display **1335**. The input device **1330** can also include a cursor control, such as a mouse, a trackball, or cursor direction keys, for communicating direction information and command selections to the processor **1310** and for controlling cursor movement on the display **1335**.

[0056] The processes, systems and methods described herein can be implemented by the computing system **1300** in response to the processor **1310** executing an arrangement of instructions contained in main memory **1315**. For example, the computing system **1300** can be in communication with the light fixture **203**. To continue this example, the computing system **1300** can transmit one or more instructions to the light fixture **203**. In this example, the computing system **1300** can detect at least one of a fob of the vehicle **105**, a key of the vehicle **105**, a user device associated with the vehicle **105**, or a selection of a selectable element displayed on a user interface. Such instructions can be read into main memory **1315** from another computer-readable medium, such as the storage device **1325**. Execution of the arrangement of instructions contained in main memory **1315** causes the computing system **1300** to perform the illustrative processes described herein. One or more processors in a multi-processing arrangement may also be employed to execute the instructions contained in main memory **1315**. Hard-wired circuitry can be used in place of or in combination with software instructions together with the systems and methods described herein. Systems and methods described herein are not limited to any specific combination of hardware circuitry and software.

[0057] Although an example computing system has been described in FIG. **13**, the subject matter including the operations described in this specification can be implemented in other types of digital electronic circuitry, or in computer software, firmware, or hardware, including the structures disclosed in this specification and their structural equivalents, or in combinations of one or more of them.

[0058] Some of the description herein emphasizes the structural independence of the aspects of the system components or groupings of operations and responsibilities of these system components. Other groupings that execute similar overall operations are within the scope of the present application. Modules can be implemented in hardware or as computer instructions on a non-transient computer readable storage medium, and modules can be distributed across various hardware or computer based components.

[0059] The systems described above can provide multiple ones of any or each of those components and these components can be provided on either a standalone system or on multiple instantiation in a distributed system. In addition, the systems and methods described above can be provided as one or more computer-readable programs or executable instructions embodied on or in one or more articles of manufacture. The article of manufacture can be cloud storage, a hard disk, a CD-ROM, a flash memory card, a PROM, a RAM, a ROM, or a magnetic tape. In general, the computer-readable programs can be implemented in any programming language, such as LISP, PERL, C, C++, C#, PROLOG, or in any byte code language such as JAVA. The software programs or

executable instructions can be stored on or in one or more articles of manufacture as object code.
[0060] Example and non-limiting module implementation elements include sensors providing any value determined herein, sensors providing any value that is a precursor to a value determined herein, datalink or network hardware including communication chips, oscillating crystals, communication links, cables, twisted pair wiring, coaxial wiring, shielded wiring, transmitters, receivers, or transceivers, logic circuits, hard-wired logic circuits, reconfigurable logic circuits in a particular non-transient state configured according to the module specification, any actuator including at least an electrical, hydraulic, or pneumatic actuator, a solenoid, an op-amp, analog control elements (springs, filters, integrators, adders, dividers, gain elements), or digital control elements.
[0061] The subject matter and the operations described in this specification can be implemented in digital electronic circuitry, or in computer software, firmware, or hardware, including the structures disclosed in this specification and their structural equivalents, or in combinations of one or more of them. The subject matter described in this specification can be implemented as one or more computer programs, e.g., one or more circuits of computer program instructions, encoded on one or more computer storage media for execution by, or to control the operation of, data processing apparatuses. Alternatively or in addition, the program instructions can be encoded on an artificially generated propagated signal, e.g., a machine-generated electrical, optical, or electromagnetic signal that is generated to encode information for transmission to suitable receiver apparatus for execution by a data processing apparatus. A computer storage medium can be, or be included in, a computer-readable storage device, a computer-readable storage substrate, a random or serial access memory array or device, or a combination of one or more of them. While a computer storage medium is not a propagated signal, a computer storage medium can be a source or destination of computer program instructions encoded in an artificially generated propagated signal. The computer storage medium can also be, or be included in, one or more separate components or media (e.g., multiple CDs, disks, or other storage devices include cloud storage). The operations described in this specification can be implemented as operations performed by a data processing apparatus on data stored on one or more computer-readable storage devices or received from other sources.
[0062] The terms “computing device”, “component” or “data processing apparatus” or the like encompass various apparatuses, devices, and machines for processing data, including by way of example a programmable processor, a computer, a system on a chip, or multiple ones, or combinations of the foregoing. The apparatus can include special purpose logic circuitry, e.g., an FPGA (field programmable gate array) or an ASIC (application specific integrated circuit). The apparatus can also include, in addition to hardware, code that creates an execution environment for the computer program in question, e.g., code that constitutes processor firmware, a protocol stack, a database management system, an operating system, a cross-platform runtime environment, a virtual machine, or a combination of one or more of them. The apparatus and execution environment can realize various different computing model infrastructures, such as web services, distributed computing and grid computing infrastructures.
[0063] A computer program (also known as a program, software, software application, app, script, or code) can be written in any form of programming language, including compiled or interpreted languages, declarative or procedural languages, and can be deployed in any form, including as a stand-alone program or as a module, component, subroutine, object, or other unit suitable for use in a computing environment. A computer program can correspond to a file in a file system. A computer program can be stored in a portion of a file that holds other programs or data (e.g., one or more scripts stored in a markup language document), in a single file dedicated to the program in question, or in multiple coordinated files (e.g., files that store one or more modules, sub programs, or portions of code). A computer program can be deployed to be executed on one computer or on multiple computers that are located at one site or distributed across multiple sites and interconnected by a communication network.

[0064] The processes and logic flows described in this specification can be performed by one or more programmable processors executing one or more computer programs to perform actions by operating on input data and generating output. The processes and logic flows can also be performed by, and apparatuses can also be implemented as, special purpose logic circuitry, e.g., an FPGA (field programmable gate array) or an ASIC (application specific integrated circuit). Devices suitable for storing computer program instructions and data can include non-volatile memory, media and memory devices, including by way of example semiconductor memory devices, e.g., EPROM, EEPROM, and flash memory devices; magnetic disks, e.g., internal hard disks or removable disks; magneto optical disks; and CD ROM and DVD-ROM disks. The processor and the memory can be supplemented by, or incorporated in, special purpose logic circuitry.
[0065] The subject matter described herein can be implemented in a computing system that includes a back end component, e.g., as a data server, or that includes a middleware component, e.g., an application server, or that includes a front end component, e.g., a client computer having a graphical user interface or a web browser through which a user can interact with an implementation of the subject matter described in this specification, or a combination of one or more such back end, middleware, or front end components. The components of the system can be interconnected by any form or medium of digital data communication, e.g., a communication network. Examples of communication networks include a local area network ("LAN") and a wide area network ("WAN"), an inter-network (e.g., the Internet), and peer-to-peer networks (e.g., ad hoc peer-to-peer networks).
[0066] While operations are depicted in the drawings in a particular order, such operations are not required to be performed in the particular order shown or in sequential order, and all illustrated operations are not required to be performed. Actions described herein can be performed in a different order.
[0067] Having now described some illustrative implementations, it is apparent that the foregoing is illustrative and not limiting, having been presented by way of example. In particular, although many of the examples presented herein involve specific combinations of method acts or system elements, those acts and those elements may be combined in other ways to accomplish the same objectives. Acts, elements and features discussed in connection with one implementation are not intended to be excluded from a similar role in other implementations or implementations.
[0068] The phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of "including" "comprising" "having" "containing" "involving" "characterized by" "characterized in that" and variations thereof herein, is meant to encompass the items listed thereafter, equivalents thereof, and additional items, as well as alternate implementations consisting of the items listed thereafter exclusively. In one implementation, the systems and methods described herein consist of one, each combination of more than one, or all of the described elements, acts, or components.
[0069] Any references to implementations or elements or acts of the systems and methods herein referred to in the singular may also embrace implementations including a plurality of these elements, and any references in plural to any implementation or element or act herein may also embrace implementations including only a single element. References in the singular or plural form are not intended to limit the presently disclosed systems or methods, their components, acts, or elements to single or plural configurations. References to any act or element being based on any information, act or element may include implementations where the act or element is based at least in part on any information, act, or element.
[0070] Any implementation disclosed herein may be combined with any other implementation or embodiment, and references to "an implementation," "some implementations," "one implementation" or the like are not necessarily mutually exclusive and are intended to indicate that a particular feature, structure, or characteristic described in connection with the implementation may be included in at least one implementation or embodiment. Such terms as used herein are not necessarily all referring to the same implementation. Any implementation may be combined with

any other implementation, inclusively or exclusively, in any manner consistent with the aspects and implementations disclosed herein.
[0071] References to “or” may be construed as inclusive so that any terms described using “or” may indicate any of a single, more than one, and all of the described terms. References to at least one of a conjunctive list of terms may be construed as an inclusive OR to indicate any of a single, more than one, and all of the described terms. For example, a reference to “at least one of ‘A’ and ‘B’” can include only ‘A’, only ‘B’, as well as both ‘A’ and ‘B’. Such references used in conjunction with “comprising” or other open terminology can include additional items.
[0072] Where technical features in the drawings, detailed description or any claim are followed by reference signs, the reference signs have been included to increase the intelligibility of the drawings, detailed description, and claims. Accordingly, neither the reference signs nor their absence have any limiting effect on the scope of any claim elements.
[0073] Modifications of described elements and acts such as variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters, mounting arrangements, use of materials, colors, orientations can occur without materially departing from the teachings and advantages of the subject matter disclosed herein. For example, elements shown as integrally formed can be constructed of multiple parts or elements, the position of elements can be reversed or otherwise varied, and the nature or number of discrete elements or positions can be altered or varied. Other substitutions, modifications, changes and omissions can also be made in the design, operating conditions and arrangement of the disclosed elements and operations without departing from the scope of the present disclosure.
[0074] For example, descriptions of positive and negative electrical characteristics may be reversed. Elements described as negative elements can instead be configured as positive elements and elements described as positive elements can instead by configured as negative elements. For example, elements described as having first polarity can instead have a second polarity, and elements described as having a second polarity can instead have a first polarity. Further relative parallel, perpendicular, vertical or other positioning or orientation descriptions include variations within +/−10% or +/−10 degrees of pure vertical, parallel or perpendicular positioning. References to “approximately,” “substantially” or other terms of degree include variations of +/−10% from the given measurement, unit, or range unless explicitly indicated otherwise. Coupled elements can be electrically, mechanically, or physically coupled with one another directly or with intervening elements. Scope of the systems and methods described herein is thus indicated by the appended claims, rather than the foregoing description, and changes that come within the meaning and range of equivalency of the claims are embraced therein.

Claims

1. An apparatus, comprising: a light fixture to dispose within a central portion of a vehicle, the central portion of the vehicle (i) positioned between a first light source of the vehicle and a second light source of the vehicle and (ii) at least partially separate from a lateral portion of the vehicle that includes the first light source and the second light source, the light fixture including a first segment, disposed within the central portion, having a third light source and a second segment, disposed within the central portion, having a fourth light source; the first segment configured to produce light with a first pattern via the third light source; the second segment configured to produce light with a second pattern via the fourth light source; the first pattern and the second pattern configured to indicate a vehicle status of the vehicle that includes a state of charge of one or more batteries of the vehicle and a charging status of the one or more batteries; the light having the first pattern which (i) originates, at a first point in time, at a first portion of the first segment and (ii) terminates, at a second point in time, at a second portion of the first segment to indicate the charging status of the one or more batteries; and the light having the second pattern to illuminate, from the first point

in time to the second point in time, across the second segment to indicate the state of charge of the one or more batteries.

2. The apparatus of claim 1, wherein the vehicle status further includes at least one of: an autonomous drive mode of the vehicle; a predetermined color pattern; an unlocked state of the vehicle; or a locked state of the vehicle.

3. (canceled)

4. The apparatus of claim 1, comprising: a second light fixture to at least partially surround an external surface of a charging cord; the second light fixture including a third segment having a fifth light source and a fourth segment having a sixth light source; the third segment configured to, responsive to one or more signals, produce light with the first pattern via the fifth light source; and the fourth segment configured to, responsive to one or more second signals, produce light with the second pattern via the sixth light source.

5. The apparatus of claim 1, wherein the first segment or the second segment is configured to produce the light having the first pattern or the light having the second pattern responsive to receipt of one or more signals, and wherein the one or more signals are received responsive to detection of at least one of: a fob of the vehicle; a key of the vehicle; a user device associated with the vehicle; or a selection of a selectable element displayed on a user interface.

6. The apparatus of claim 1, comprising: a second light fixture to dispose between a first rear light of the vehicle and a second rear light of the vehicle, the second light fixture including a third segment having a fifth light source and a fourth segment having a sixth light source; the third segment configured to, responsive to one or more signals, produce light with the first pattern via the fifth light source; and the fourth segment configured to, responsive to one or more second signals, produce light with the second pattern via the sixth light source.

7.-**9**. (canceled)

10. The apparatus of claim 1, comprising: at least one of the third light source or the fourth light source configured to produce light having at least one color; and the light having the at least one color different than a color of light produced by at least one of the first light source of the vehicle or the second light source of the vehicle.

11. The apparatus of claim 1, comprising: memory configured to store instructions; and a processor configured to execute the instructions to cause the processor to: receive, via an over-the-air (OTA) update, a first update to the first pattern or a second update to the second pattern; and transmit, to the first segment or the second segment, one or more signals to cause the first light source to product light according to the first update or to cause the second light source to product light according to the second update.

12. A vehicle, comprising: an apparatus, including: a light fixture to dispose within a central portion of the vehicle, the central portion (i) positioned between a first light source of the vehicle and a second light source of the vehicle and (ii) at least partially separate from a lateral portion of the vehicle that includes the first light source and the second light source, the light fixture including a first segment, disposed within the central portion, having a third light source and a second segment, disposed within the central portion, having a fourth light source; the first segment configured to, responsive to one or more first signals, produce light with a first pattern via the third light source; the second segment configured to, responsive to one or more second signals, produce light with a second pattern via the fourth light source; the first pattern and the second pattern configured to indicate a vehicle status of the vehicle that includes a state of charge of one or more batteries of the vehicle and a charging status of the one or more batteries; the light having the first pattern which (i) originates, at a first point in time, at a first portion of the first segment and (ii) terminates, at a second point in time, at a second portion of the first segment to indicate the charging status of the one or more batteries; and the light having the second pattern to illuminate, from the first point in time to the second point in time, across the second segment to indicate the state of charge of the one or more batteries.

13. The vehicle of claim 12, wherein the vehicle status further includes at least one of: an autonomous drive mode of the vehicle; a predetermined color pattern; an unlocked state of the vehicle; or a locked state of the vehicle.

14. The vehicle of claim 12, the apparatus comprising: the first light source and the second light source configured to receive one or more third signals to cause the first light source and the second light source to produce light with a third pattern.

15. The vehicle of claim 12, the apparatus comprising: a second light fixture to at least partially surround an external surface of a charging cord; the second light fixture including a third segment having a fifth light source and a fourth segment having a sixth light source; the third segment configured to, responsive to one or more third signals, produce light with the first pattern via the fifth light source; and the fourth segment configured to, responsive to one or more fourth signals, produce light with the second pattern via the sixth light source.

16. The vehicle of claim 12, wherein at least one of the one or more first signals or the one or more second signals are received responsive to detection of at least one of: a fob of the vehicle; a key of the vehicle; a user device associated with the vehicle; or a selection of a selectable element displayed on a user interface.

17. The vehicle of claim 12, the apparatus comprising: a second light fixture to dispose between a first rear light of the vehicle and a second rear light of the vehicle, the second light fixture including a third segment having a fifth light source and a fourth segment having a sixth light source; the third segment configured to, responsive to the one or more first signals, produce light with the first pattern via the fifth light source; and the fourth segment configured to, responsive to the one or more second signals, produce light with the second pattern via the sixth light source.

18. A method, comprising: disposing a light fixture of an apparatus within a central portion of a vehicle, the central portion of the vehicle (i) positioned between a first headlight of the vehicle and a second headlight of the vehicle, the light fixture including a first segment, disposed within the central portion, having a first light source and a second segment, disposed within the central portion, having a second light source; receiving, by the first segment, one or more first signals to cause the first segment to produce light with a first pattern via the first light source; receiving, by the second segment, one or more second signals to cause the second segment to produce light with a second pattern via the second light source; and the first segment having the light with the first pattern in combination with the second segment having the light with the second pattern configured to indicate (i) state of charge of one or more batteries of the vehicle and (ii) a charging status of the one or more batteries by having an illumination of light appear to originate at the first segment and terminate at the second segment.

19.-**23**. (canceled)