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(54) **RETRACTABLE MONITOR WITH ADJUSTABLE PITCH AND YAW**

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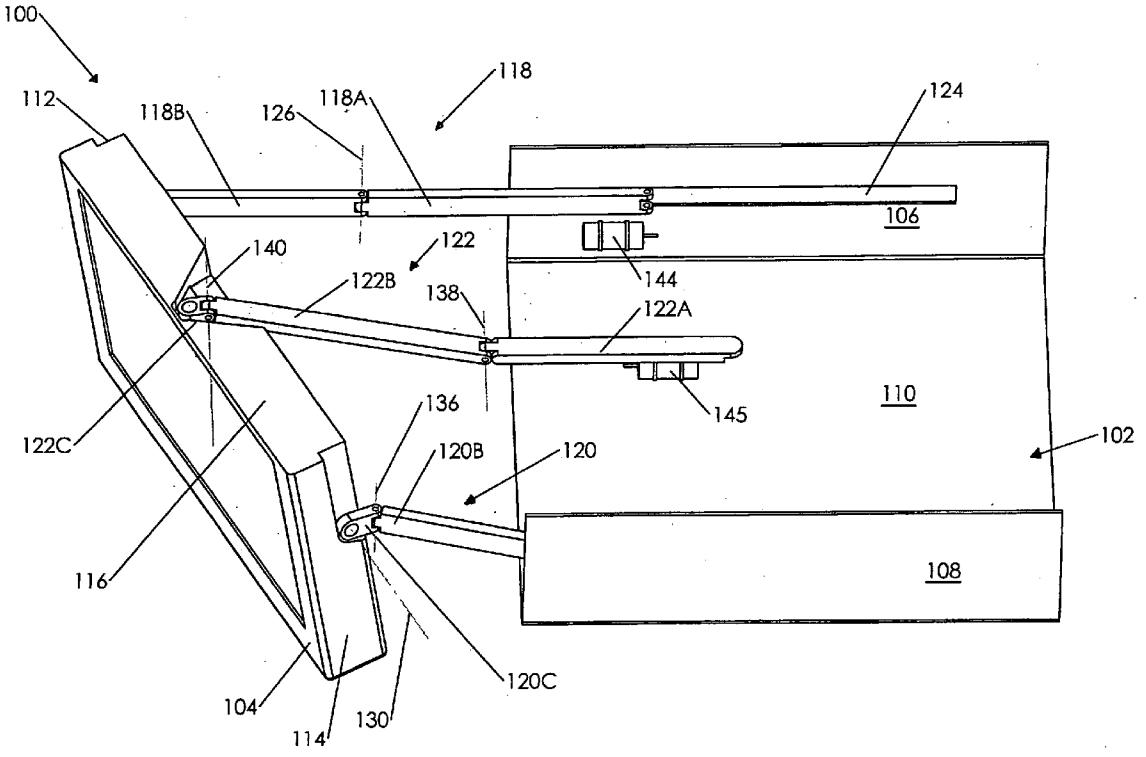
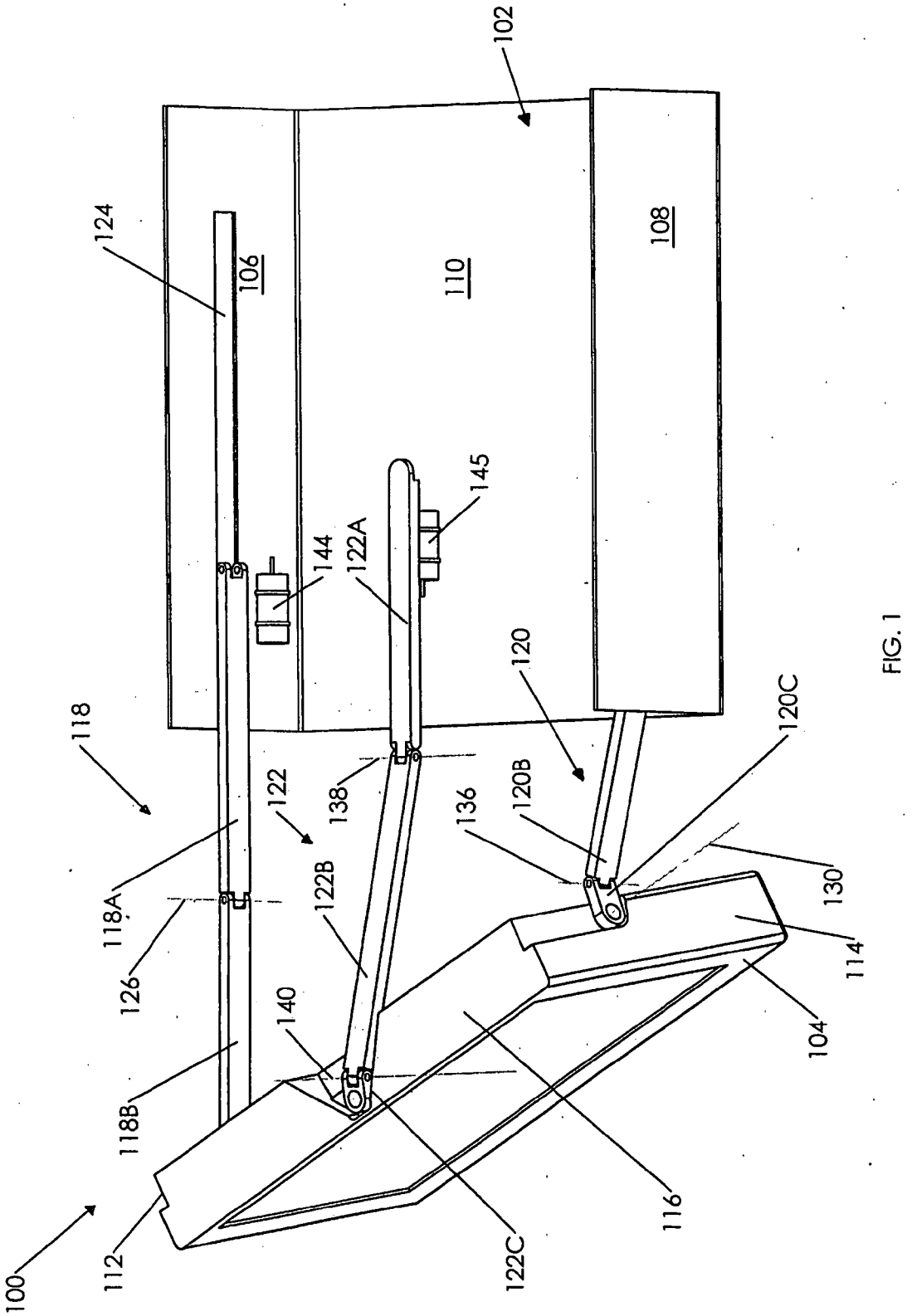
(57) **ABSTRACT**

An in-dash infotainment system includes a chassis, a monitor, and three articulating arms each pivotably coupled to a side of the monitor and slidably coupled to the chassis. The articulating arms allow the monitor to stow horizontally within the chassis, and extend and flip vertically for viewing. When extended, the first, the second, and the third articulating arms also allow the pitch and the yaw of the monitor to be adjusted.

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112
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FIG. 1

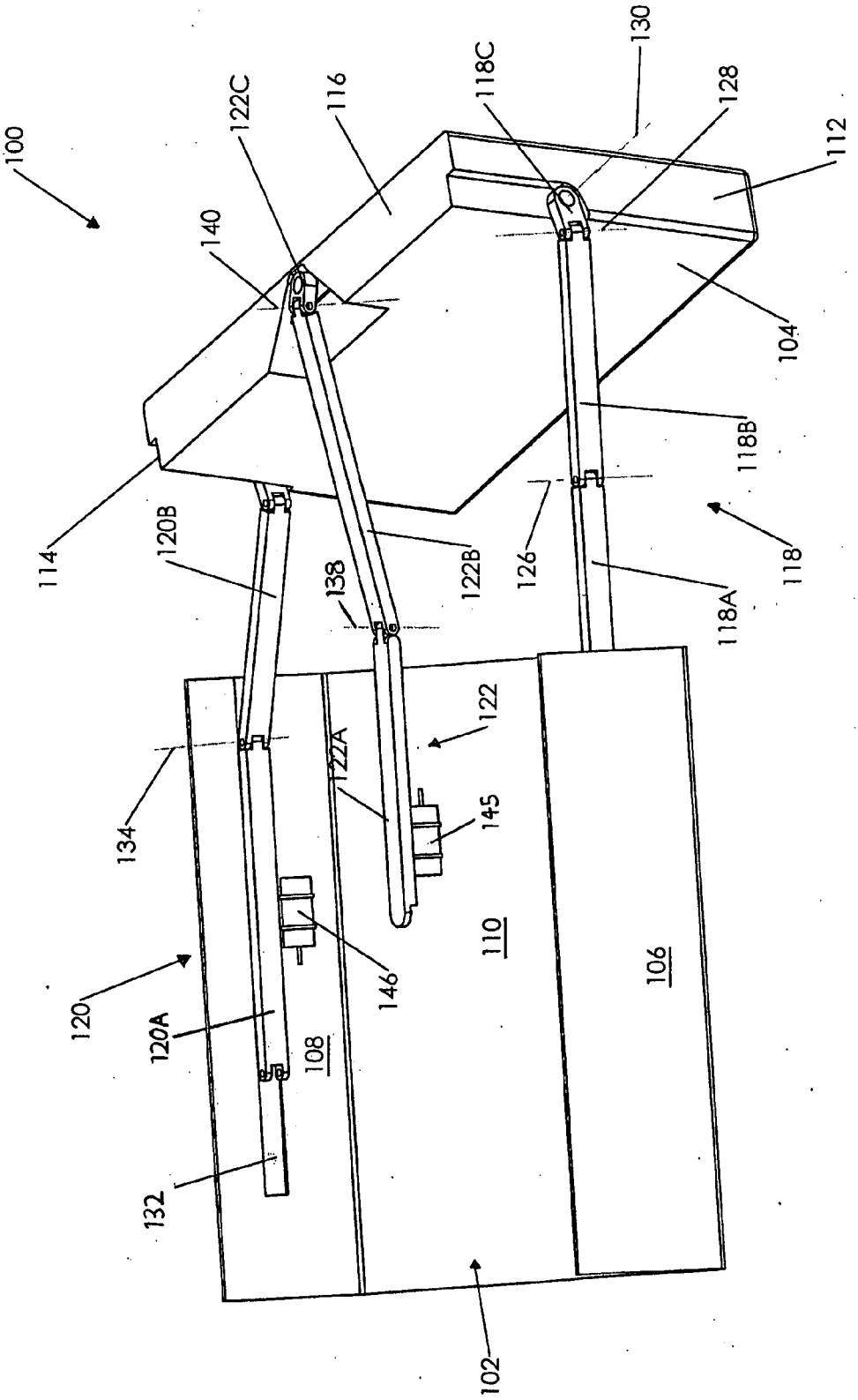
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FIG. 2

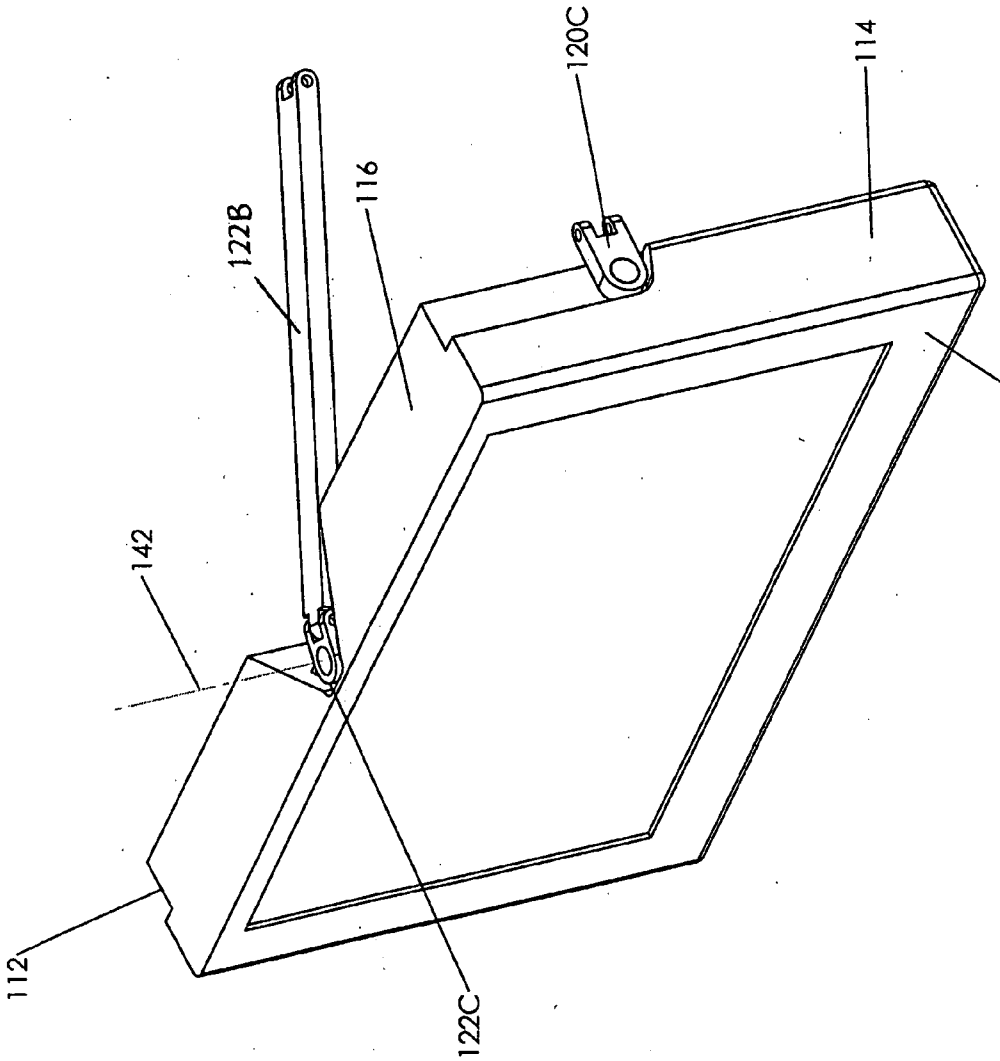

FIG. 3

RETRACTABLE MONITOR WITH ADJUSTABLE PITCH AND YAW

FIELD OF INVENTION

[0001] This present disclosure relates to a retractable monitor with adjustable pitch and yaw.

DESCRIPTION OF RELATED ART

[0002] Some in-dash receivers for motor vehicles include a monitor that retracts into the receiver when the monitor is not used. Some roof mount entertainment systems for motor vehicles include a monitor that flips up when the monitor is not used.

SUMMARY

[0003] In some embodiments of the present disclosure, an in-dash infotainment system includes a chassis, a monitor, and three articulating arms each pivotably coupled to a side of the monitor and slidably coupled to the chassis. The articulating arms allow the monitor to stow horizontally within the chassis, and extend and flip vertically for viewing. When extended, the first, the second, and the third articulating arms also allow the pitch and the yaw of the monitor to be adjusted.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIGS. **1** and **2** illustrates perspective views of an in-dash infotainment system; and

[0005] FIG. **3** illustrates a perspective view of a monitor of the in-dash infotainnment system, all arranged in accordance with embodiments of the present disclosure.

[0006] Use of the same reference numbers in different figures indicates similar or identical elements.

DETAILED DESCRIPTION

[0007] FIGS. **1**, **2**, and **3** illustrate an in-dash infotainment system **100** in some embodiments of the present disclosure. System **100** may include, but is not limited to, a radio, a global positioning system (GPS), a digital video disc (DVD) player, a general purpose computer for running a web browser and other applications, a wireless broadband adapter for accessing a network such as the Internet, or any combination of these features.

[0008] Referring to FIG. **1** unless otherwise specified, system **100** includes a chassis **102** and a retractable monitor **104**. Chassis **102** includes an open end defined by a top, a left sidewall **106**, and a right sidewall **108**, and a bottom **110**. For clarity, the top of chassis **102** and internal electronics and mechanical components are not shown.

[0009] Monitor **104** has a first vertical side (left side) **112**, a second vertical side (right side) **114**, and a horizontal side (top) **116** respectively linked by three articulating arms **118**, **120**, and **122** to chassis **102**. Articulating arms **118**, **120**, and **122** allow monitor **104** to be stowed horizontally within chassis **102**, and to be extended and flipped down for viewing. Once extended and flipped down, articulating arms **118**, **120**, and **122** allow the pitch and the yaw of monitor **104** to be manually or automatically adjusted.

[0010] First articulating arm **118** includes a first member **118**A, a second member **118**B, and a third member **118**C (FIG. **2**). First member **118** is a slide that is slidably engaged to a track **124** on left sidewall **106** of chassis **102**. Second member **118**B is pivotably coupled to first member **118**A about a first vertical axis **126**. Third member **118**C (FIG. **2**) is a bracket that is pivotably coupled to second member **118**B about a second vertical axis **128** (FIG. **2**) and to left side **112** of monitor **104** about a first horizontal axis **130** (FIG. **2**).

[0011] Second articulating arm **120** includes a first member **120**A (FIG. **2**), a second member **120**B, and a third member **120**C. First member **120**A is a slide that is slidably engaged to a track **132** (FIG. **2**) on right sidewall **108** of chassis **102**. Second member **120**B is pivotably coupled to first member **120**A about a third vertical axis **134** (FIG. **2**). Third member **120**C is a bracket that is pivotably coupled to second member **120**B about a fourth vertical axis **136** and to right side **114** of monitor **104** about first horizontal axis **130**.

[0012] Third articulating arm **122** includes a first member **122**A, a second member **122**B, and a third member **122**C (FIG. **3**). First member **122**A is a slide that is slidably engaged to a track (not shown) on the top of chassis **102**. Second member **122**B is pivotably coupled to first member **122**A about a second horizontal axis **138**. Third member **122**C (FIG. **3**) is a bracket that is pivotably coupled to second member **122**B about a third horizontal axis **140** and to top **116** of monitor **104** about a fifth vertical axis **142** (FIG. **3**).

[0013] A user may manually extend the horizontally stowed monitor **104** and flip down the monitor for viewing. Alternatively, articulating arms **118**, **120**, and **122** may be motorized to automatically extend the horizontally stowed monitor **104** from within chassis **102** and to flip down the monitor for viewing. To extend the horizontally stowed monitor **104**, motors translate articulating arms **118**, **120**, and **122** at the same rate. Once monitor **104** clears chassis **102**, articulating arm **122** can translate faster than articulating arms **118** and **120** to flip down monitor **104**. The process is reversed to stow away monitor **102** within chassis **104**. A motor **144** is mechanically linked by gears, belts, or other conventional means to drive articulating arm **118**, a motor **145** is mechanically linked by gears, belts, or other conventional means to drive articulating arm **122**, and a motor **146** (FIG. **2**) is mechanically linked by gears, belts, or other conventional means to drive articulating arm **120**.

[0014] Once monitor **102** is flipped down in a vertical orientation, the user may further adjust the pitch and the yaw of the monitor. The pitch of monitor **102** may be adjusted about the first horizontal axis **130**, and the yaw of the monitor may be adjusted about the fifth vertical axis **142** (FIG. **3**). To adjust the pitch, the user rotates monitor **102** about the first horizontal axis **130**. In the process, first member **122**A of articulating arm **122** may translate and second member **122**B may pivot to accommodate the change in pitch. To adjust the yaw, the user rotates monitor **102** about the fifth vertical axis **142** (FIG. **3**). In the process of yawing, first member **118**A of articulating arm **118** may translate, second member **118**B may pivot, first member **120**A of articulating arm **120** may translate, and second member **120**B may pivot to accommodate the change in yaw.

[0015] Various other adaptations and combinations of features of the embodiments disclosed are within the scope of the present disclosure. For example, instead of locating articulating arm **122** on the top of chassis **102** and on top of monitor **104**, the articulating arm **122** may be located on the bottom of chassis **102** and on the bottom of monitor **104**. Numerous embodiments are encompassed by the following claims.

What is claimed is:

1. An in-dash infotainment system, comprising:

a chassis;

a monitor comprising a first vertical side, a second vertical side, and a horizontal side;

a first articulating arm pivotably coupled to the first vertical side of the monitor and slidably coupled to the chassis;

a second articulating arm pivotably coupled to the second vertical side of the monitor and slidably coupled to the chassis; and

a third articulating arm pivotably coupled to the horizontal side of the monitor and slidably coupled to the chassis.

2. The in-dash infotainment system, wherein:

the first articulating arm comprises first, second, third members, the first member being slidably coupled to the chassis, the second member being pivotably coupled to the first member about a first vertical axis, the third member being pivotably coupled to (1) the second member about a second vertical axis and (2) the first vertical side of the monitor about a first horizontal axis;

the second articulating arm comprises fourth, fifth, and sixth members, the fourth member being slidably coupled to the chassis, the fifth member being pivotably coupled to the fourth member about a third vertical axis, the sixth member being pivotably coupled to (1) the fifth member about a fourth vertical axis and (2) the second vertical side of the monitor about the first horizontal axis;

the third articulating arm comprises seventh, eighth, and ninth members, the seventh member being slidably coupled to the chassis, the eighth member being pivotably coupled to the seventh member about a second horizontal axis, the ninth member being pivotably coupled to (1) the eighth member about a third horizontal axis and (2) the horizontal side of the monitor about a fifth vertical axis.

3. The in-dash infotainment system of claim **2**, wherein the chassis comprises first, second, and third tracks for slidably engaging the first, the fourth, and the seventh members.

4. The in-dash infotainment system of claim **3**, wherein the chassis further comprises motors mechanically linked to the first, the fourth, and the seventh members, respectively to extend and retract the monitor.

5. The in-dash infotainment system of claim **4**, wherein the first, the second, and the third articulating arms allow a pitch of the monitor to be adjusted about the first horizontal axis, and a yaw of the monitor to be adjusted about the fifth vertical axis.

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