properly configured, the device may update the display to present additional graphical overlays, instructions, and symbols associated with configuring additional controls of the control panel. Thus, the device may use augmented reality to assist and guide a user (or multiple users) through the process of configuring a control panel.

In a particular embodiment, a method of identifying and configuring a control panel is disclosed. The method includes receiving, at a processor from a camera, image data associated with a control panel. The method also includes presenting one or more images at a display. The one or more images are generated based on the image data. The method includes determining a location of a first control of the control panel based on the image data and based on control settings data. The method includes providing an indication of the location of the first control at the display, and providing an indication of a desired configuration of the first control at the display.

In another embodiment, an apparatus includes a camera, a display, a processor, and a memory. The memory includes instructions that, when executed by the processor cause the processor to receive or process image data associated with a control panel from the camera. The memory includes instructions that, when executed by the processor cause the processor to present one or more images at the display. The one or more images are generated based on the image data. The memory includes instructions that, when executed by the processor cause the processor to determine a location of a first control of the control panel based on the image data and based on control settings data. The memory includes instructions that, when executed by the processor cause the processor to provide an indication of the location of the first control at the display. The memory includes instructions that, when executed by the processor cause the processor to provide an indication of a desired configuration of the first control at the display.

In yet another embodiment, a non-transitory computer-readable storage medium includes instructions that, when executed by a processor, cause the processor to receive or process image data from a camera associated with a control panel. The non-transitory computer-readable storage medium further includes instructions that, when executed by the processor, cause the processor to present one or more images at a display. The one or more images are generated based on the image data. The non-transitory computer-readable storage medium further includes instructions that, when executed by the processor, cause the processor to determine a location of a first control of the control panel based on the image data and based on control settings data. The non-transitory computer-readable storage medium further includes instructions that, when

properly configured, the device may update the display to present additional graphical overlays, instructions, and symbols associated with configuring additional controls of the control panel. Thus, the device may use augmented reality to assist and guide a user (or multiple users) through the process of configuring a control panel.

According to one aspect of the disclosure there is provided a method comprising: receiving, at a processor from a camera, image data associated with a control panel; presenting one or more images at a display, wherein the one or more images are generated based on the image data; determining a first location of a first control of the control panel based on the image data and based on control settings data; providing a first indication of the first location of the first control at the display; determining a desired configuration based on the control settings data and the first location, wherein the desired configuration includes a second location of the first control, and wherein the second location is distinct from the first location; and providing a second indication of the desired configuration of the first control at the display.

According to a further aspect of the disclosure, there is provided an apparatus comprising: a camera; a display; a processor; and a memory comprising instructions that, when executed by the processor, cause the processor to: receive image data associated with a control panel from the camera; present one or more images at the display, wherein the one or more images are generated based on the image data; determine a first location of a first control of the control panel based on the image data and based on control settings data; provide a first indication of the first location of the first control at the display; determine a desired configuration based on the control settings data and the first location, wherein the desired configuration includes a second location of the first control, and wherein the second location is distinct from the first location; and provide a second indication of the desired configuration of the first control at the display.

In yet another embodiment, a non-transitory computer-readable storage medium includes instructions that, when executed by a processor, cause the processor to receive or process image data from a camera associated with a control panel. The non-transitory computer-readable storage medium further includes instructions that, when executed by the processor, cause the processor to present one or more images at a display. The one or more images are generated based on the image data. The non-transitory computer-readable storage medium further includes instructions that, when executed by the processor, cause the processor to determine a location of a first control of the control panel based on the image data and based on control

settings data. The non-transitory computer-readable storage medium further includes instructions that, when

WHAT IS CLAIMED IS:

1. A method comprising:

receiving, at a processor from a camera, image data associated with a control panel;

presenting one or more images at a display, wherein the one or more images are generated based on the image data;

determining a location of a first control of the control panel based on the image data and based on control settings data;

providing an indication of the location of the first control at the display; and

providing an indication of a desired configuration of the first control at the display.

2. The method of claim 1, further comprising receiving input indicating that a configuration of the first control has been modified.

3. The method of claim 2, further comprising:

receiving second image data associated with the control panel; and

determining whether the modified configuration of the first control corresponds to the desired configuration of the first control based on the second image data and based on the control settings data.

4. The method of claim 3, further comprising:

presenting one or more additional images at the display, wherein the one or more additional images are generated based on the second image data;

in response to a determination that the modified configuration of the first control corresponds to the desired configuration, determining a second location of a second control based on the second image data and based on the control settings data;

providing an indication of the second location of the second control at the display; and

providing an indication of a desired configuration of the second control at the display, wherein the desired configuration of the second control is determined based on the control settings data.

5. The method of claim 4, wherein the indication of the second location indicates a direction from the location of the first control to the second location.

6. The method of claim 1, further comprising determining calibration data based on a location of the camera relative to a calibration feature, wherein the location of the first control is determined in part based on the calibration data.

7. The method of claim 1, wherein the processor is incorporated into an electronic flight bag device.

8. An apparatus comprising:

a camera;

a display;

a processor; and

a memory comprising instructions that, when executed by the processor, cause the processor to:

receive image data associated with a control panel from the camera;

present one or more images at the display, wherein the one or more images are generated based on the image data;

determine a location of a first control of the control panel based on the image data and based on control settings data;

provide an indication of the location of the first control at the display; and

provide an indication of a desired configuration of the first control at the display.

9. The apparatus of claim 8, wherein the memory further comprises instructions that, when executed by the processor, cause the processor to determine whether a configuration of the first control has been modified.

10. The apparatus of claim 9, wherein the memory further comprises instructions that, when executed by the processor, cause the processor to:

receive second image data associated with the control panel; and

determine whether the modified configuration of the first control corresponds to the desired configuration of the first control based on the second image data and based on the control settings data.

11. The apparatus of claim 10, wherein the memory further comprises instructions that, when executed by the processor, cause the processor to:

present one or more additional images at the display, wherein the one or more additional images are generated based on the second image data;

in response to a determination that the modified configuration of the first control corresponds to the desired configuration, determine a second location of a second control based on the second image data and based on the control settings data;

provide an indication of the second location of the second control at the display; and

provide an indication of a desired configuration of the second control at the display, wherein the desired configuration is determined based on the control settings data.

12. The apparatus of claim 11, wherein the second location is identified relative to the location of the first control, a location of a reference control, a location of a reference marking, or a combination thereof.

13. The apparatus of claim 8, further comprising at least one sensor, wherein the location of the first control is further determined based on sensor data received from the at least one sensor, wherein the at least one sensor comprises an inertial sensor, a motion sensor, an orientation sensor, or a combination thereof, and wherein the desired configuration is determined based on the control settings data.

14. The apparatus of claim 8, wherein the control settings data comprises control data and directional data associated with an electronic checklist, wherein the control data identifies a layout of a plurality of controls of the control panel, and wherein the directional data includes information indicating a direction from a particular control of the plurality of controls to a second control of the plurality of controls.

15. The apparatus of claim 8, wherein the indication of the location of the first control comprises one or more symbols overlaying the image data.

CLAIMS:

1. A method comprising:

receiving, at a processor from a camera, image data associated with a control panel;

presenting one or more images at a display, wherein the one or more images are generated based on the image data;

determining a first location of a first control of the control panel based on the image data and based on control settings data;

providing a first indication of the first location of the first control at the display;

determining a desired configuration based on the control settings data and the first location, wherein the desired configuration includes a second location of the first control, and wherein the second location is distinct from the first location; and

providing a second indication of the desired configuration of the first control at the display.

2. The method of claim 1, further comprising, after providing the second indication, receiving input indicating that a configuration of the first control has been modified.

3. The method of claim 2, further comprising:

after receiving the input, receiving second image data associated with the control panel, wherein the second image data represents a modified configuration of the first control; and

determining whether the modified configuration of the first control corresponds to the desired configuration of the first control based on the second image data and based on the control settings data.

4. The method of claim 3, further comprising:

presenting one or more additional images at the display, wherein the one or more additional images are generated based on the second image data;

in response to a determination that the modified configuration of the first control corresponds to the desired configuration, determining a third location of a second control based on the second image data and based on the control settings data;

providing a third indication of the third location of the second control at the display, wherein the third indication indicates a direction to move the camera so that the camera is pointed at the second control; and

in response to determining that the camera has been moved to point at the second control, providing a fourth indication of a second desired configuration of the second control at the display, wherein the desired configuration of the second control is determined based on the control settings data.

5. The method of claim 4, wherein the control settings data corresponds to a plurality of steps, wherein the first location corresponds to a first step of the plurality of steps, wherein the desired configuration corresponds to a second step of the plurality of steps, and wherein the second step is ordered subsequent to the first step in the control settings data.

6. The method of claim 1 or claim 2, further comprising determining calibration data based on a third location of the camera relative to a calibration feature, wherein the first location is determined in part based on the calibration data.

7. The method of claim 1, wherein the desired configuration is further based on second image data received from a second camera distinct from the camera.

8. An apparatus comprising:

a camera;

a display;

a processor; and

a memory comprising instructions that, when executed by the processor, cause the processor to:

receive image data associated with a control panel from the camera;

present one or more images at the display, wherein the one or more images are generated based on the image data;

determine a first location of a first control of the control panel based on the image data and based on control settings data;

provide a first indication of the first location of the first control at the display;

determine a desired configuration based on the control settings data and the first location, wherein the desired configuration includes a second location of the first control, and wherein the second location is distinct from the first location; and

provide a second indication of the desired configuration of the first control at the display.

9. The apparatus of claim 8, wherein the instructions, when executed by the processor, cause the processor to determine whether a configuration of the first control has been modified.

10. The apparatus of claim 9, wherein the instructions, when executed by the processor, cause the processor to:

receive second image data associated with the control panel, wherein the second image data represents a modified configuration of the first control; and

determine whether the modified configuration of the first control corresponds to the desired configuration of the first control based on the second image data and based on the control settings data.

11. The apparatus of claim 10, wherein the instructions, when executed by the processor, cause the processor to:

present one or more additional images at the display, wherein the one or more additional images are generated based on the second image data;

in response to a determination that the modified configuration of the first control corresponds to the desired configuration, determine a third location of a second control based on the second image data and based on the control settings data;

provide a third indication of the third location of the second control at the display; and

provide a fourth indication of a second desired configuration of the second control at the display, wherein the second desired configuration is determined based on the control settings data.

12. The apparatus of claim 11, wherein the third location is identified relative to the first location, a fourth location of a reference control, a fifth location of a reference marking, or a combination thereof.

13. The apparatus of claim 8, further comprising at least one sensor, wherein the first location is further determined based on sensor data received from the at least one sensor, and wherein the at least one sensor comprises an inertial sensor, a motion sensor, an orientation sensor, or a combination thereof.

14. The apparatus of any one of claims 8 to 13, wherein the control settings data comprises control data and directional data associated with an electronic checklist, wherein the control data identifies a layout of a plurality of controls of the control panel, and wherein the directional data

includes information indicating a direction from a particular control of the plurality of controls to a second control of the plurality of controls.

15. The apparatus of any one of claims 8 to 14, wherein the first indication comprises one or more symbols overlaying the image data.