SYSTEMS AND METHODS FOR PARTICIPANT-CONTROLLED VIDEO CONFERENCING

RELATED APPLICATIONS

[0001] This application claims priority to U.S. Patent Application No. 62/890,482 filed on August 22, 2019 and titled "SYSTEMS AND METHODS FOR PARTICIPANT-CONTROLLED VIDEO CONFERENCING" and which is incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] This disclosure generally relates to the field of video conferencing. More specifically, this disclosure relates to the field of video conferencing using USB equipped devices.

SUMMARY OF INVENTION

[0002a] An aspect of present disclosure provides a conferencing system, comprising:

a first conferencing device, including:

a first power supply;

a first processor;

a video out module in communication with the first processor;

a first USB hub in communication with the first processor and in electrical communication with the first power supply to receive power from the first power supply; and

a first connector in electrical communication with the first USB hub to power a first portable electronic device when the first portable electronic device is in electrical communication with the first connector;

wherein when the first portable electronic device is in electrical communication with the first connector, the first processor is configured to:

receive a first control signal from the first portable electronic device;

receive first mirrored video data from the first portable electronic device;

receive, from a second conferencing device, second mirrored video data of a second portable electronic device connected to the second conferencing device; and

send the first mirrored video data received from the first portable electronic device and the second mirrored video data received from the second conferencing device to the video out module for transmission to a presentation device as split screen video data.

[0002b] Another aspect of the present disclosure provides a conferencing device, comprising:

a power supply;

a processor;

a video out module in communication with the processor;

a USB hub in communication with the processor and in electrical communication with the power supply to receive power from the power supply;

a first connector in electrical communication with the USB hub to power a first portable electronic device when the first portable electronic device is coupled to the first connector; and

a second connector in electrical communication with the USB hub to power a second portable electronic device when the second electronic device is coupled to the second connector,

wherein when the first and second portable electronic devices are coupled to the first and second connectors respectfully, the processor is configured to:

receive first and second control signals respectively from the first and second portable electronic devices;

receive first and second mirrored video data respectively from the first and second portable devices;

receive, from a second conferencing device, third mirrored video data of a third portable electronic device connected to the second conferencing device; and

send the first mirrored video data received from the first portable electronic device, the second mirrored video data received from the second portable electronic device, and the third mirrored video data received from the second conferencing device to the video out module for transmission to a presentation device as split screen video data.

[0002c] Another aspect of the present disclosure provides a conferencing device, comprising:

a power supply;

a processor;

a USB hub in electrical communication with the power supply to receive power from the power supply;

a wireless interface in electrical communication with the processor; and

a first wireless charger in electrical communication with the hub and the power supply to thereby power a first portable electronic device when the first portable electronic device is in proximity with the first wireless charger,

wherein the processor is configured to:

receive a first control signal from the first portable electronic device through the wireless interface;

receive first mirrored video data from the first portable electronic device through the wireless interface;

receive, from a second conferencing device, second mirrored video data of a second portable electronic device connected to the second conferencing device; and

send the first mirrored video data received from the first portable electronic device and the second mirrored video data received from the second conferencing device to the wireless interface for wireless transmission to a presentation device as split screen video data.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] Non-limiting and non-exhaustive embodiments of the disclosure are described, including various embodiments of the disclosure with reference to the figures, in which:

[0004] FIG. 1 illustrates a conferencing device, according to one embodiment.

[0005] FIG. 2 illustrates a system including a conferencing device in a conference room setting, according to an embodiment.

[0006] FIG. 3 illustrates a system of directly connected conferencing devices in a conference room setting, according to an embodiment.

[0007] FIG. 4 illustrates a computer connected to a conferencing device via a USB cable and running software configured to send control signals and/or video data to the conferencing device, the software presenting control signal actuators, according to an embodiment.

[0008] FIG. 5A illustrates a smartphone connected to a conferencing device via a USB cable and running software configured to send control signals and/or video data to the conferencing device, the software presenting control signal actuators, according to an embodiment.

[0009] FIG. 5B illustrates a smartphone connected to a conferencing device via a USB cable and running software sending video data to the conferencing device, the software running in the background, according to an embodiment.

[0010] FIG. 6 illustrates a presentation device that is connected to a video out port of a conferencing device via a video cable, the presentation device simultaneously displaying the video data from two different external host devices, according to an embodiment.

[0011] FIG. 7 illustrates two presentation devices, each connected to a video out port of a conferencing device via a video cable, the screens of each presentation device

CLAIMS

1. A conferencing system, comprising:

a first conferencing device ~~to provide power to a portable electronic device and receive video data from the portable electronic device~~, including:

a first power supply;

a first processor;

a video out ~~interface~~ module in communication with the first processor;

a first USB hub in communication with the first processor and in electrical communication with the first power supply to receive power from the first power supply; and

a first connector in electrical communication with the first USB hub to power ~~the~~ a first portable electronic device when the first portable electronic device is in electrical communication with the first connector~~,~~;

wherein when the first portable electronic device is in electrical communication with the first connector, the first processor is configured to:

receive a first control signal from the first portable electronic device;

receive first mirrored video data from the first portable electronic device;

receive, from a second conferencing device, second mirrored video data of a second portable electronic device connected to the second conferencing device; and

send the first mirrored video data received from the first portable electronic device and the second mirrored video data received from the second conferencing device to the video out module for transmission to a presentation device as split screen video data.

2. The conferencing system of claim 1, wherein the first processor is further configured to stop sending the split screen video data to the presentation device responsive to a second control signal.

3. The conferencing system of claim 1, wherein the video out module includes a wireless interface.

4. The conferencing system ~~conference device~~ of claim 1, wherein the video out module includes an output port to couple to a cable for communication with the presentation device.

5. The conferencing system of claim 1, the first conferencing device further ~~comprising~~ including a second connector in electrical communication with the first USB hub to power a ~~second~~ third portable electronic device,

wherein when the ~~second~~ third portable electronic device is in electrical communication with the second connector, the first processor is configured to:

receive a second control signal from the ~~second~~ third portable electronic device;

receive third mirrored video data from the ~~second~~ third portable electronic device; and

send the third mirrored video data to the video out module ~~for transmission to a presentation device~~.

~~6. The conferencing system of claim 5, wherein the processor is configured to receive video data from both the first and second portable electronic devices and transmit the video data to the presentation device for simultaneous display of the video data corresponding to both the first and second portable electronic devices.~~

~~7~~6. ~~The conferencing system of claim 6, wherein the processor is configured to transmit the video data to the presentation device in a split screen format.~~

~~8~~6. The conferencing system of claim ~~5~~1, wherein the first processor is configured to send the third mirrored video data to the video out module for transmission to the presentation device for simultaneous display of the first mirrored video data, the second mirrored video data, and the third mirrored video data in the split screen video data~~and a second presentation device simultaneously~~.

7. The conferencing system of claim 5, wherein the video out module transmits the third mirrored video data to a second presentation device.

~~9~~8. The conferencing system of claim 1, wherein the first USB hub is of USB Type-C and further comprising a USB cable in electrical communication with the first USB hub and the first connector.

~~10~~9. The conferencing system of claim 1, ~~further comprising a second conferencing device in electrical communication with the first conferencing device,~~wherein the second conferencing device compris~~es~~ing:

a second processor;

~~a video out interface in communication with the processor;~~

a second USB hub in communication with the second processor and in electrical communication with ~~the~~ a second power supply to receive power from the second power supply; and

a ~~third~~ second connector in electrical communication with the second USB hub to power the second portable electronic device when the second portable electronic device is in electrical communication with the ~~third~~ second connector~~;~~.

wherein when the second portable electronic device is in electrical communication with the ~~third~~ second connector, the second processor is configured to:

~~receive a first control signal from the portable electronic device;~~

receive the second mirrored video data from the second portable electronic device; and

send the second mirrored video data to the first conferencing ~~video out interface for transmission to a presentation~~ device.

~~11~~10. A conferencing device ~~to provide power to a plurality of portable electronic devices and receive video data from the portable electronic devices~~, comprising:

a power supply;

a processor;

a video out module in communication with the processor;

a USB hub in communication with the processor and in electrical communication with the power supply to receive power from the power supply;

a first connector in electrical communication with the USB hub to power a first portable electronic device when the first portable electronic device is coupled to the first connector; and

a second connector in electrical communication with the USB hub to power a second portable electronic device when the second electronic device is coupled to the second connector,

wherein when the first and second portable electronic devices are coupled to the first and second connectors respectfully, the processor is configured to:

receive first and second control signals respectively from the first and second portable electronic devices;

receive first and second mirrored video data respectively from the first and second portable devices;

receive, from a second conferencing device, third mirrored video data of a third portable electronic device connected to the second conferencing device; and

send the first mirrored video data received from the first portable electronic device, the second mirrored video data received from the second portable electronic device, and the third mirrored video data received from the second conferencing device to the video out module for transmission to a presentation device as split screen video data.

~~12~~11. The conferencing device of claim ~~11~~10, wherein the processor is further configured to stop sending the split screen video data to the presentation device responsive to one of the first control signal~~s~~ and the second control signal.

~~13~~12. The conferencing device of claim ~~11~~10, wherein the video out module includes a wireless interface.

~~14~~13. The conferencing ~~conference~~ device of claim ~~11~~10, wherein the video out module includes an output port to couple to a cable for communication with the presentation device.

~~15. The conferencing device of claim 11, wherein the processor is configured to receive the video data from the first and second portable electronic devices simultaneously and transmit the video data to the presentation device for simultaneous display of the video data corresponding to both the first and second portable electronic devices.~~

~~16. The conferencing device of claim 15, wherein the processor is configured to transmit the video data to the presentation device in a split screen format.~~

~~17~~14. The conferencing device of claim ~~11~~10, wherein the processor is configured to send the split screen video data to the video out module for transmission to the presentation device and a ~~second~~ third conferencing ~~presentation~~ device simultaneously.

~~18~~15. The conferencing device of claim ~~11~~10, wherein the USB hub is of USB Type-C and further comprising:

a first USB cable in electrical communication with the USB hub and the first connector; and

a second USB cable in electrical communication with the USB hub and the second connector.

~~19~~16. A conferencing device ~~to provide power to a portable electronic device and receive video data from the portable electronic device~~, comprising:

a power supply;

a processor;

a USB hub in electrical communication with the power supply to receive power from the power supply;

a wireless interface in electrical communication with the processor; and

a first wireless charger in electrical communication with the hub and the power supply to thereby power ~~the~~ a first portable electronic device when the first portable electronic device is in proximity with the first wireless charger,

wherein the processor is configured to:

receive a first control signal from the first portable electronic device through the wireless interface;

receive first mirrored video data from the first portable electronic device through the wireless interface;

receive, from a second conferencing device, second mirrored video data of a second portable electronic device connected to the second conferencing device; and

send the first mirrored video data received from the first portable electronic device and the second mirrored video data received from the second conferencing device ~~video data~~ to the wireless interface for wireless transmission to a presentation device as split screen video data.

~~20~~17. The conferencing ~~system~~ device of claim ~~19~~16, further comprising a connector in electrical communication with the USB hub to power a third portable electronic device when the third portable electronic device is coupled to the connector and, when the third portable electronic device is coupled to the connector, the processor is configured to:

receive a second control signal from the third portable electronic device;

receive third mirrored video data from the third portable electronic device; and

send the third mirrored video data to the wireless interface ~~for transmission to a presentation device~~.

~~21~~18. The conferencing device ~~system~~ of claim ~~20~~17, wherein the USB hub is of USB Type-C and further comprising a USB cable in electrical communication with the USB hub and the connector.

~~22~~19. The conferencing ~~conference~~ device of claim ~~19~~16, further comprising a video out module including an output port to couple to a cable for communication with the presentation device.

~~23~~20. The conferencing device ~~system~~ of claim ~~19~~16, further comprising a second wireless charger in electrical communication with the USB hub to power a ~~second~~ third portable electronic device.

~~24~~21. The conferencing ~~system~~ device of claim ~~23~~20, wherein the processor is configured to ~~receive~~ send third mirrored video data ~~from both~~ of the ~~first and second~~ third portable electronic device~~s and transmit the video data~~ to the wireless interface for wireless transmission to the presentation device for simultaneous display of the first mirrored video data, the second mirrored video data, and the third mirrored video data in the split screen video data ~~corresponding to both the first and second portable electronic devices~~.

~~25~~22. The conferencing ~~system~~ device of claim ~~24~~17, wherein the ~~processor is configured to transmit~~ wireless interface transmits the third mirrored video data to a second ~~the~~ presentation device ~~in a split screen format~~.

~~26. The conferencing system of claim 19, wherein the processor is configured to send the video data to the wireless interface for transmission to the presentation device and a second presentation device simultaneously.~~