October 10, 2018

Keyboard for USB-C Tablet

Gregory Granito

David Schneider

Follow this and additional works at: https://www.tdcommons.org/dpubs_series

Keyboard for USB-C tablet

ABSTRACT

Tablet computing devices without pogo pins connect to keyboards via Bluetooth or micro-USB. These connectivity options have certain problems - Bluetooth consumes additional power and often has connectivity problems, while micro-USB keyboards exclusively occupy the USB port, which makes simultaneous charging of the tablet or use with other accessories impossible.

USB-C enables simultaneous fast charging and data transfer over USB. Leveraging USB-C technology, this disclosure provides techniques that enable tablets with USB-C port to reliably connect to a keyboard for simultaneous USB-based fast charging and access to other USB accessories.

KEYWORDS

- USB
- USB-C
- Tablet computer
- Tablet keyboard

BACKGROUND

Currently, tablet computing devices without pogo pins connect to keyboards via Bluetooth or micro-USB. These connectivity options have certain problems. Bluetooth consumes additional power and often has connectivity problems. Micro-USB keyboards exclusively occupy the USB port of the tablet, making impossible simultaneous charging of the tablet or use with other accessories.

DESCRIPTION

This disclosure leverages the USB-C standard to enable a tablet with USB-C port to simultaneously use a wired keyboard and other USB-C accessories, e.g., power adapters, external monitors, etc.
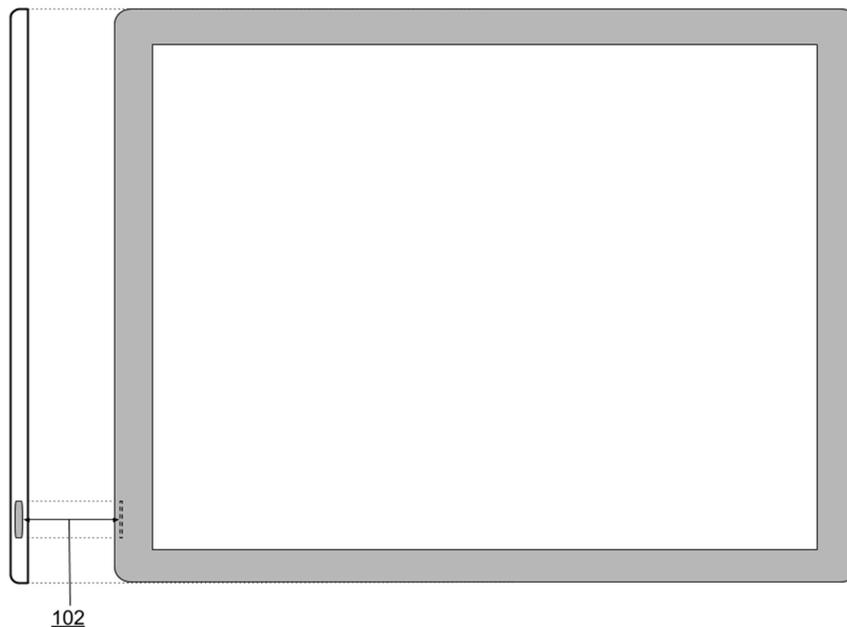

102

Fig. 1: A tablet with a USB-C port; side and front views

Fig. 1 illustrates the side and front views of a tablet computing device with a USB-C port (102). For such tablets, herein is disclosed a keyboard-holding case that provides USB-C connectivity to the tablet.
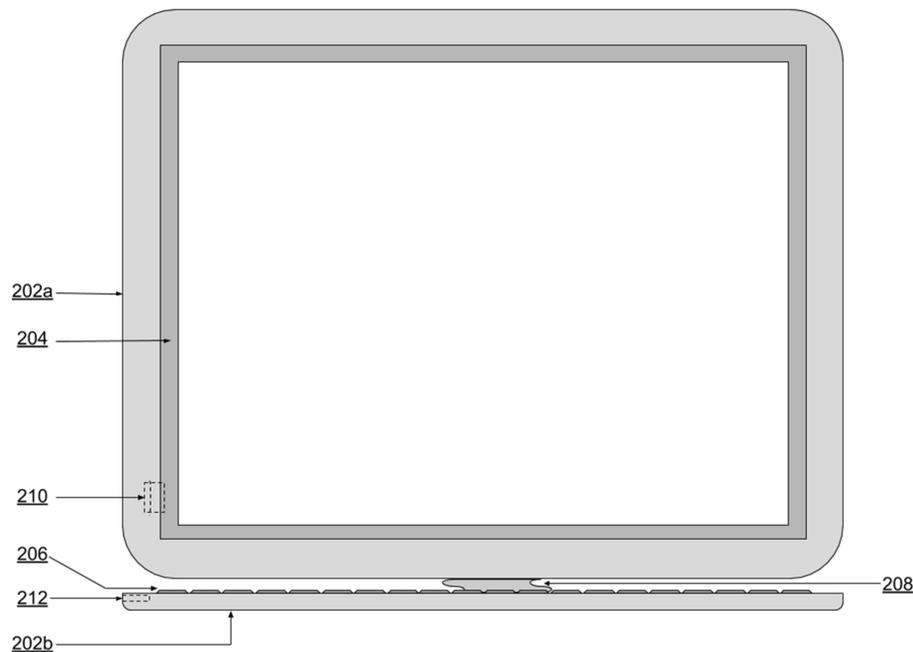
Fig. 2: Case that fits tablet and connects tablet to keyboard (front view)

Fig. 2 illustrates a case that fits a tablet and connects it to a keyboard, per the techniques of this disclosure. One half of the case (202a) is a firm shell in a shape that snugly fits the tablet (204). This half grips the tablet and keeps the tablet attached to the case. The other half of the case (202b) includes a keyboard (206) that connects to the tablet. The two halves of the case are connected with a folding hinge/fabric (208) such that the apparatus can be closed when not in use.

On the tablet half of the case, there is a USB-C plug (210) in a location such that when the tablet is in the case, the USB-C plug of the case lines up and plugs into the USB-C port of the tablet. There is also a USB-C port on the side of the keyboard (212). By virtue of the keyboard-tablet connection, USB-C port (212) provides full USB-C functionality to the tablet. For example, USB-C port on the keyboard (212) can be used to charge the tablet and also enables the use of the tablet with another USB-C accessory, e.g., external monitors, etc. In this

manner, the functionality of the USB-C port as well as a wired keyboard is provided without requiring additional ports or pogo pins on the tablet.

The case may have additional ports or receptacles, e.g., additional USB-C ports, USB-A ports, ethernet ports, HDMI ports, display-port / mini-display receptacles, 3.5mm headphone receptacles, SD/MicroSD receptacles, etc. These additional ports or receptacles allow charging the tablet or use of other devices with the tablet without removing the tablet from the case. The techniques of this disclosure apply similarly to any accessory or device with USB-C pass-through.
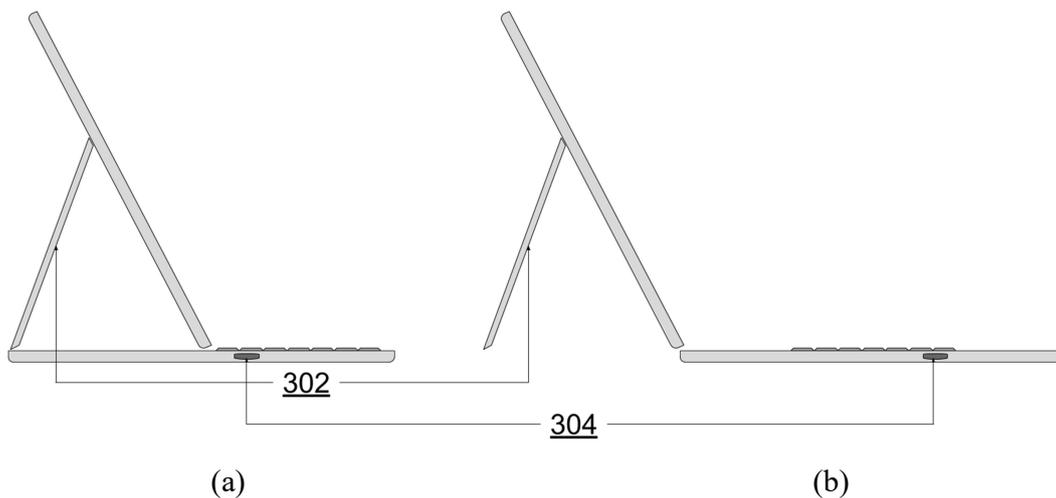

(a)   (b)

Fig. 3: Side views of tablet-keyboard case

Fig. 3 shows side views of two example configurations of the tablet-keyboard case. In the configuration of Fig. 3(a), the tablet, held within the case, rests at approximately mid-keyboard position. In Fig. 3(b), the tablet rests just outside the keyboard. In both configurations, a kickstand (302) or other mechanism can be used at the back of the tablet half of the case to prop up the tablet. USB-C port (304) on the keyboard half of the case provides USB-C functionality to the tablet.
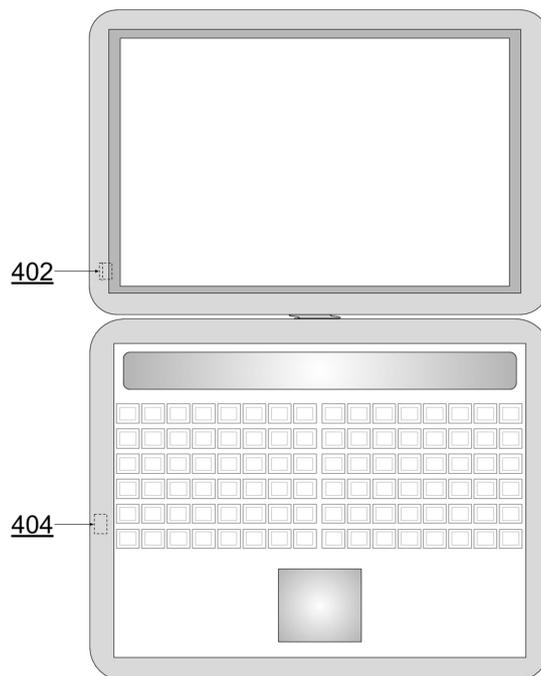
Fig. 4: Top view of tablet-keyboard case

Fig. 4 shows a top view of the tablet-keyboard case when open, e.g., in the configuration of Fig. 3(b). USB-C slot (404) on the keyboard half of the case provides USB-C functionality to the tablet via USB plug (402) present in the tablet half of the case.

CONCLUSION

Currently, tablet computing devices without pogo pins connect to keyboards via Bluetooth or micro-USB. These connectivity options have certain issues: Bluetooth consumes additional power and often has connectivity problems, while micro-USB keyboards exclusively occupy the USB port, making impossible simultaneous charging of the tablet or use with other accessories. Leveraging USB-C technology, this disclosure provides techniques that enable a tablet with a USB-C port to reliably connect to a keyboard for simultaneous USB-based fast charging and access to other USB accessories.