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RECHARGEABLE ENTRY-LEVEL PEN MODULE PUBLICATION

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Rechargeable Entry-Level Pen Module Publication

This disclosure relates to the PC industry and focuses on low cost active stylus features. Active stylus' require power to work, and this is usually provided by a battery or super capacitor so that the pen can be small and cordless for writing. Active pens are becoming more and more popular with enhanced performance and features. This means more and more AAAA batteries are being used and discarded. A rechargeable solution helps solve this problem but is not always a cost-effective design upfront. The rechargeable module disclosed is specifically designed to be compatible with standard entry level pens that can also use a regular AAAA battery instead.

Customers for education and small businesses are more focused on cost. The lowest cost active pen is made with a standard AAAA battery. Customers understand the benefit of having a rechargeable battery, but simply cannot afford the upcharge to a more expensive pen. Some customers can afford this and understand the benefit and cost savings in the long run when you consider replacement batteries. By creating this module, we are fulfilling both customer's needs. In addition, users who already own the standard entry level pen may be tired of changing batteries and decide to upgrade to this module and it will still be compatible. In addition, we can add an LED to the module to let the user know the battery level.

This module is designed to be the same size as the existing pen's AAAA battery and end cap assembly (see Fig. 1.). The module has one contact on the end that will contact directly to the active stylus PCB and provide the 1.35-1.5V needed. On the exterior the module has threading that is the same as the existing end cap and serve as the ground connection between the rechargeable pen module and main stylus PCB. The module can be inserted and screwed directly onto the pen body. Inside the Pen module is a Li-Ion rechargeable battery that is wired to the module PCB (see Fig. 2.). On this PCB is where the charge controller and type-C port/pogo pins are located. The buck converter components controlled by the charge controller (PMIC) help to convert the power from the Li-Ion battery to a useful power for the active pen system board. The current AAAA battery is 1.5 volts. Therefore, the Li-Ion battery, which is 3.7 volts, must be converted to 1.5 volts so it can be directly compatible with the pen. On the module there can either be a connector, USB-C for example, or 2 contacts to accept power from a cable or pogo pins.

The goal is for there to not be any changes necessary for the main pen module. That is the main benefit of this design for cost saving and backward compatibility. In addition, this design will help create an image of sustainability by limiting waste from dead AAAA batteries.

Abstract:

Active stylus' require power to work, and this is usually provided by a battery or super capacitor so that the pen can be small and cordless for writing. Active pens are becoming more and more popular with enhanced performance and features. This means more and more AAAA batteries are being used and discarded. A rechargeable solution helps solve this problem but is not always a cost-effective design upfront. The rechargeable module disclosed is specifically designed to be compatible with standard entry level pens that can also use a regular AAAA battery instead.

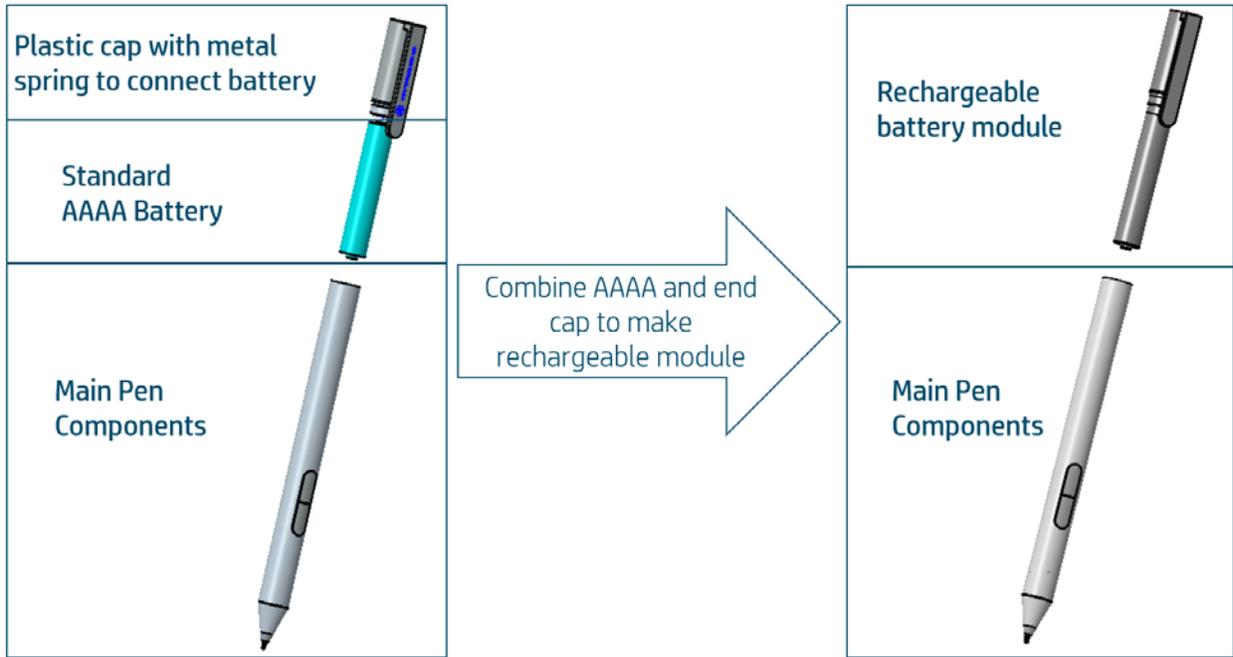


Fig. 1. This figure illustrates the original entry level pen and how it can be used with this module

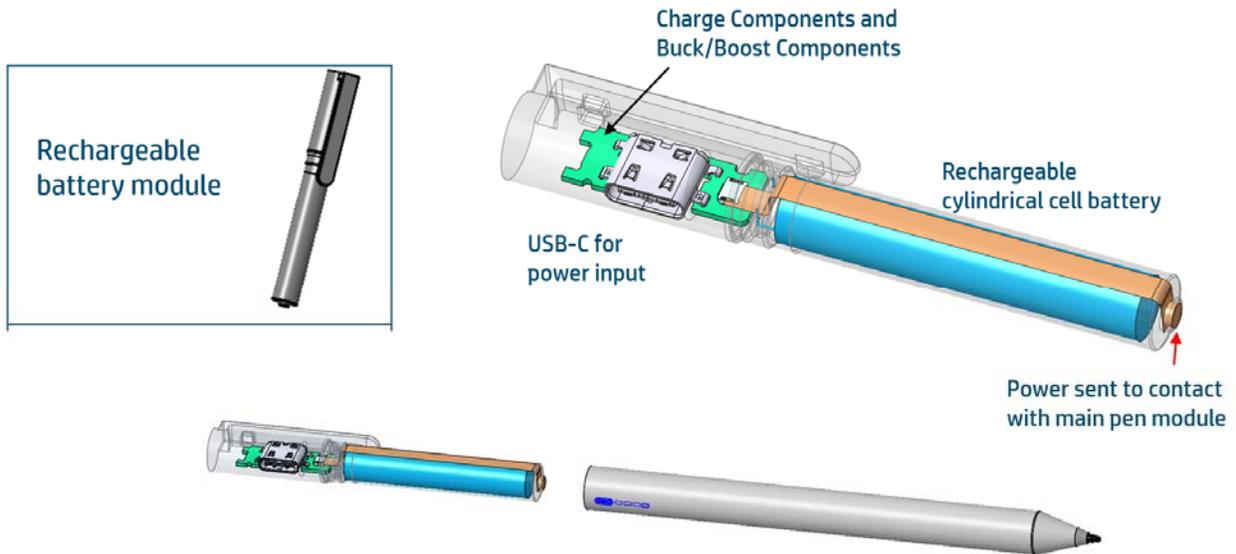


Fig. 2. This figure shows the internal assembly of the module

Disclosed by Derek Kanas and Rafael Ibanez, HP Inc.