US 20230231211A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2023/0231211 A1**

Bertken (43) **Pub. Date: Jul. 20, 2023**

(54) **HYBRID BATTERY CARTRIDGE**

(71) Applicant: **IdeaPond LLC**, Carlsbad, CA (US)

(72) Inventor: **Dennis K. Bertken**, Carlsbad, CA (US)

(73) Assignee: **IdeaPond LLC**, Carlsbad, CA (US)

(21) Appl. No.: **18/154,932**

(22) Filed: **Jan. 16, 2023**

Related U.S. Application Data

(60) Provisional application No. 63/378,238, filed on Oct. 4, 2022, provisional application No. 63/266,797, filed on Jan. 14, 2022.

Publication Classification

(51) **Int. Cl.**

H01M 10/48	(2006.01)
H01M 16/00	(2006.01)
H01M 6/50	(2006.01)
F21L 4/08	(2006.01)
F21V 23/02	(2006.01)
H02J 7/00	(2006.01)
H02J 7/34	(2006.01)

(52) **U.S. Cl.**

CPC ***H01M 10/482*** (2013.01); ***H01M 10/488*** (2013.01); ***H01M 16/00*** (2013.01); ***H01M 6/505*** (2013.01); ***F21L 4/08*** (2013.01); ***F21V 23/023*** (2013.01); ***H02J 7/0063*** (2013.01); ***H02J 7/0048*** (2020.01); ***H02J 7/005*** (2020.01); ***H02J 7/0013*** (2013.01); ***H02J 7/34*** (2013.01); *H02J 2207/30* (2020.01)

(57) **ABSTRACT**

Systems, apparatus, and methods for managing power in a hybrid battery cartridge. The hybrid battery cartridge may output single-use battery power, rechargeable battery power, or both. Thus, a single battery cartridge may store multiple types of batteries and allow the batteries to be used separately or concurrently. In one example usage, the battery cartridge may be inserted into other devices to provide power. Additionally, the intelligent hybrid battery cartridge may be used as a stand-alone charger to charge other devices. The intelligent hybrid battery cartridge is designed to allow for retrofitting into existing single-use battery powered devices such as flashlights and lanterns to make them hybrid power enabled. The hybrid battery cartridge may select a power source based the type of load and/or on a reserve power threshold.