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*of the United States Patent and Trademark Office has received
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of law have been complied with, and it has been determined that
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Therefore, this United States

Patent

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John A. Guarnieri

DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

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(12) **United States Patent**
Ke

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(54) **INTELLIGENT LOCK THAT REPLACES
ELECTRONIC COMPONENTS WITH A KEY**

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(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

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G07C 9/00 (2020.01)

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CPC **G07C 9/00174** (2013.01); **G07C**
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(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2021/0351920 A1 * 11/2021 Tang G07C 9/00309

FOREIGN PATENT DOCUMENTS

CN 113870460 A * 12/2021 G07C 9/00944
CN 114215429 A * 3/2022 G08B 13/00
CN 116084781 A * 5/2023 E05B 3/0004
GB 260951 A * 1/1927 H01B 7/083
WO WO-2022190094 A1 * 9/2022 G07C 9/00896

* cited by examiner

Primary Examiner — K. Wong

(57) **ABSTRACT**

The present application discloses an intelligent lock enabling the replacement of electronic components using a key, comprising: a housing; an electronic component, which is detachably mounted on the housing; a locking assembly, disposed inside the housing and configured to lock the electronic component onto the housing; and a key, adapted to the locking assembly and controlling the locking assembly. By controlling the locking assembly with the key, the intelligent lock allows for quick installation and removal of the electronic component, facilitating maintenance operations such as repairs and battery replacement. Moreover, it enables switching between a keypad electronic lock component and a fingerprint electronic lock component, thereby meeting diverse user requirements, reducing workload, and minimizing resource waste associated with the need to repurchase door locks.

9 Claims, 6 Drawing Sheets