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(12) **United States Patent**
Lamego

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(54) **ELECTRONIC DEVICE THAT COMPUTES HEALTH DATA**

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(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 185 days.

This patent is subject to a terminal disclaimer.

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A61B 5/0205 (2006.01)

A61B 5/00 (2006.01)

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

CPC **A61B 5/0205** (2013.01); **A61B 5/0402** (2013.01); **A61B 5/14551** (2013.01);

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(58) **Field of Classification Search**

CPC **A61B 5/0205**; **A61B 5/007**; **A61B 5/0402**; **A61B 5/14551**; **A61B 5/6898**; **A61B 5/70**;

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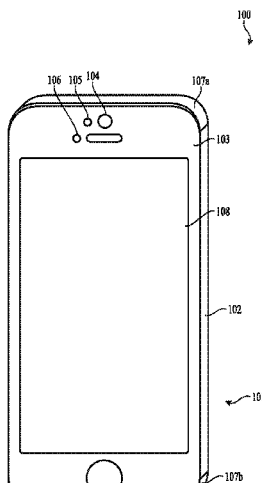
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(57) **ABSTRACT**

An electronic device includes a camera, an ambient light sensor, and a proximity sensor. The electronic device uses one or more of the camera and the proximity sensor to emit light into a body part of a user touching a surface of the electronic device and one or more of the camera, the ambient light sensor, and the proximity sensor to receive at least part of the emitted light reflected by the body part of the user. The electronic device computes health data of the user based upon sensor data regarding the received light. In some implementations, the electronic device may also include one or more electrical contacts that contact one or more body parts of the user. In such implementations, the health data may be further computed based on the an electrical measurement obtained using the electrical contacts.

20 Claims, 7 Drawing Sheets



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(58) **Field of Classification Search**
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 See application file for complete search history.

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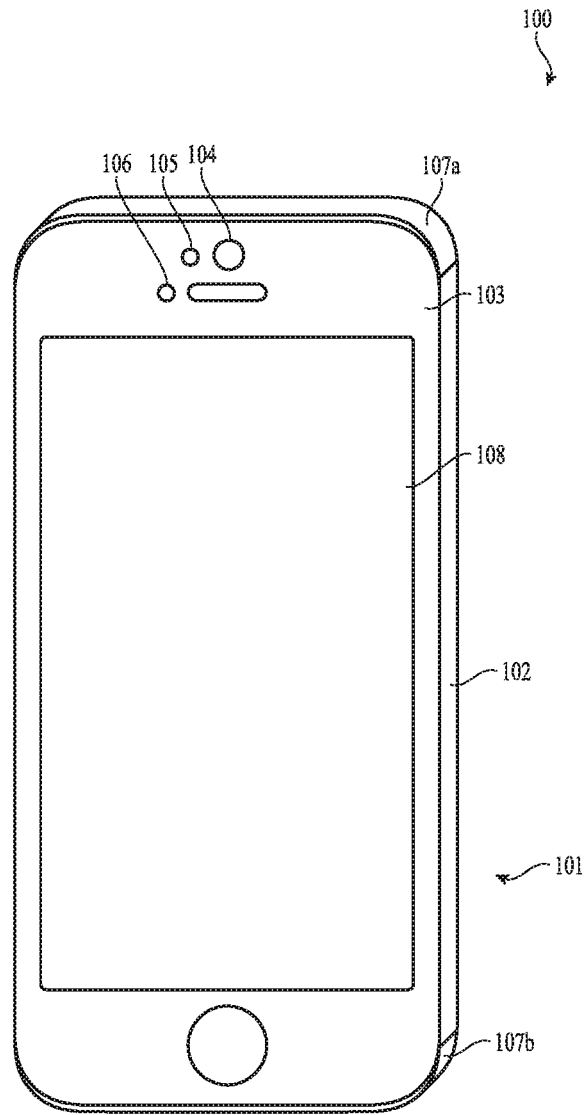


FIG. 1

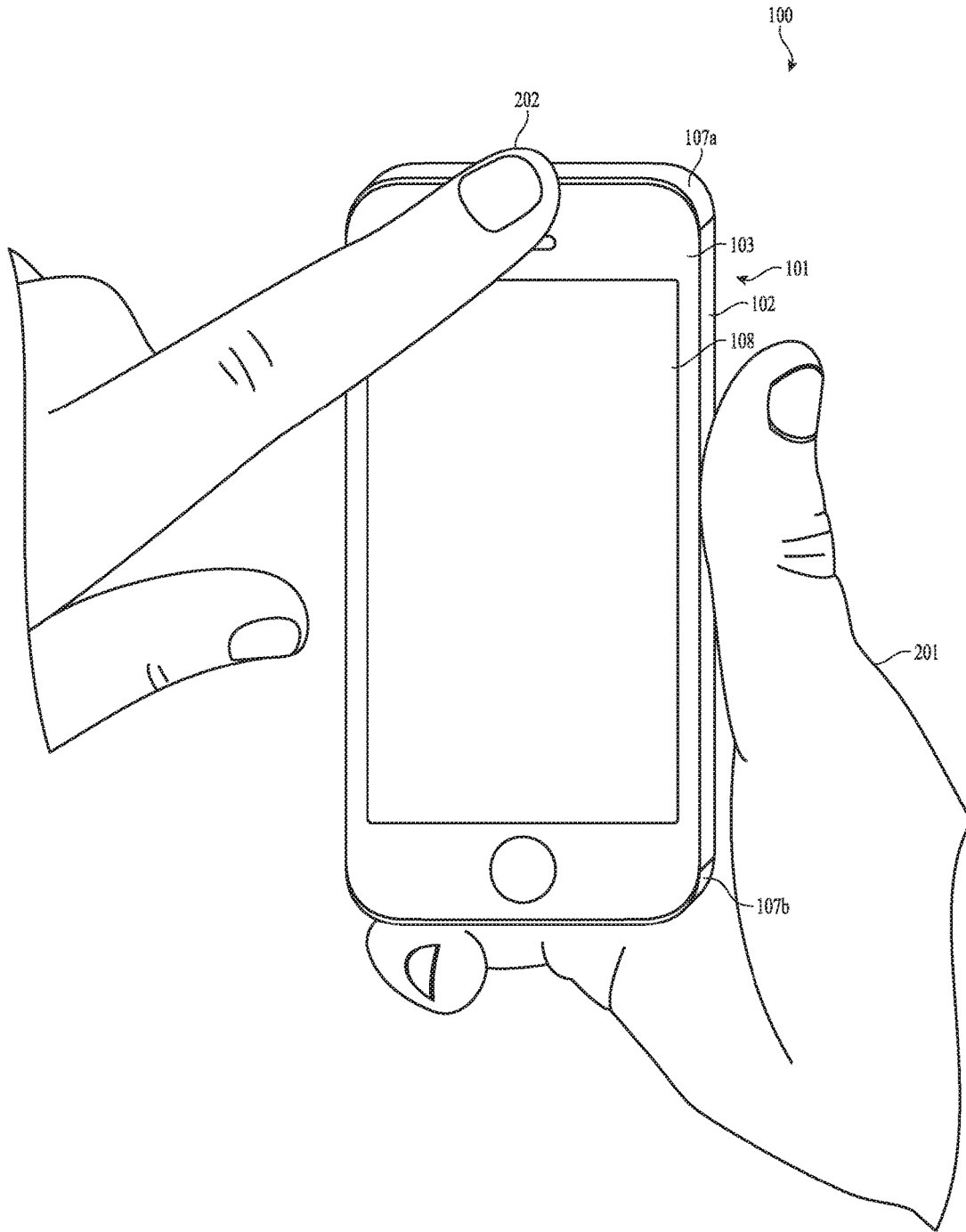


FIG. 2

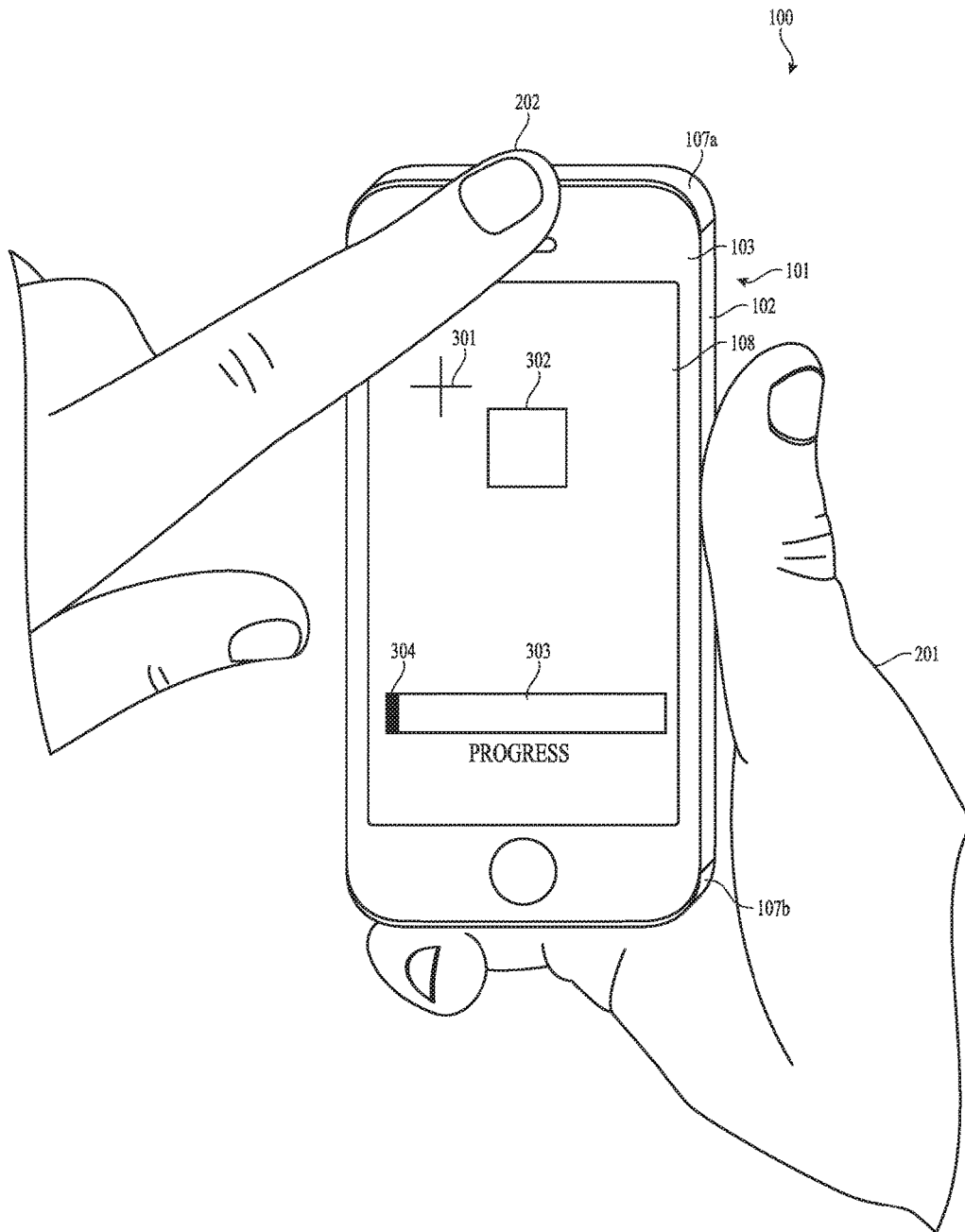


FIG. 3

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