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(54) **MULTIPLE LIGHT PATHS ARCHITECTURE AND OBSCURATION METHODS FOR SIGNAL AND PERFUSION INDEX OPTIMIZATION**

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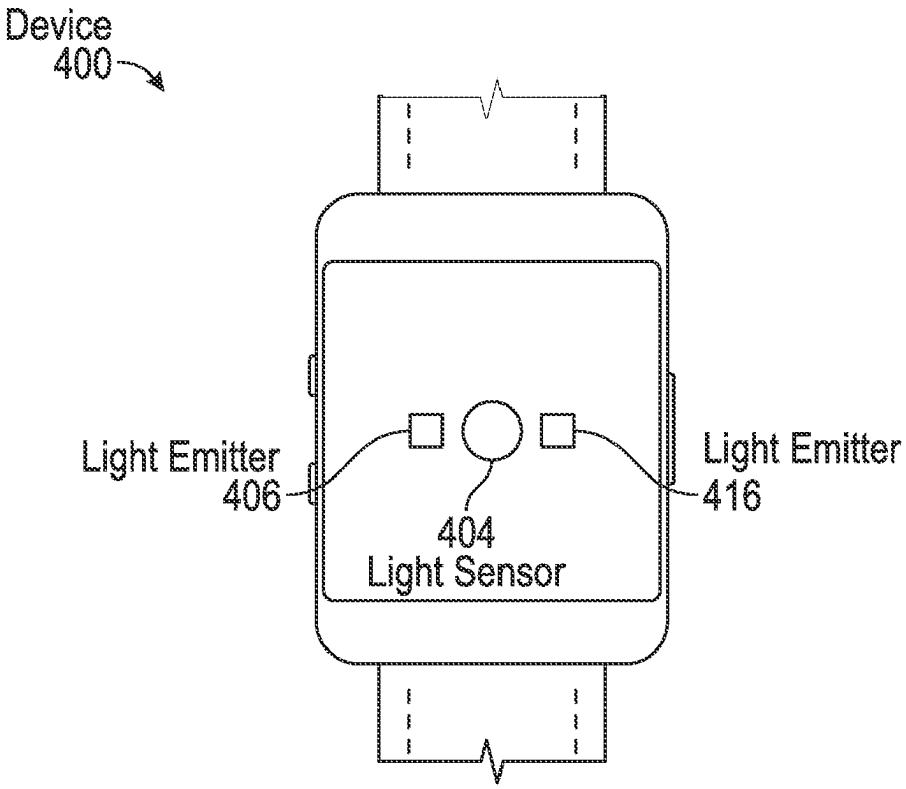
(57) **ABSTRACT**

A photoplethysmographic (PPG) device is disclosed. The PPG device can include one or more light emitters and one or more light sensors to generate the multiple light paths for measuring a PPG signal and perfusion indices of a user. The multiple light paths between each pair of light emitters and light detectors can include different separation distances to generate both an accurate PPG signal and a perfusion index value to accommodate a variety of users and usage conditions. In some examples, the multiple light paths can include the same separation distances for noise cancellation due to artifacts resulting from, for example, tilt and/or pull of the device, a user's hair, a user's skin pigmentation, and/or motion. The PPG device can further include one or more lenses and/or reflectors to increase the signal strength and/or and to obscure the optical components and associated wiring from being visible to a user's eye.



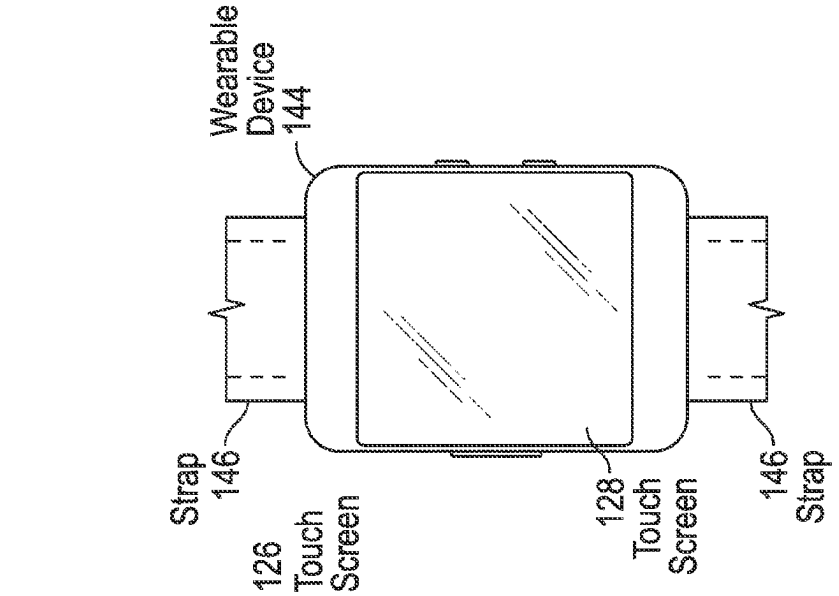


FIG. 1C

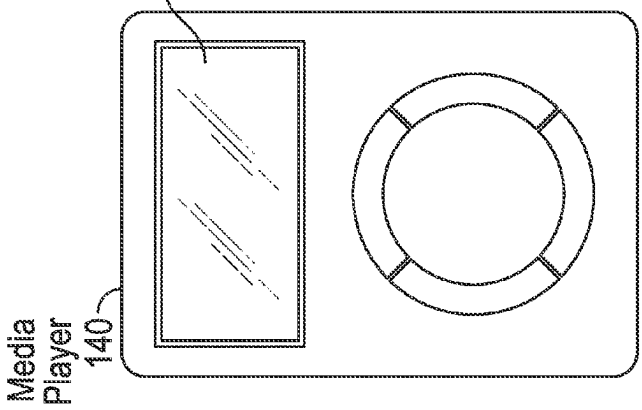


FIG. 1B

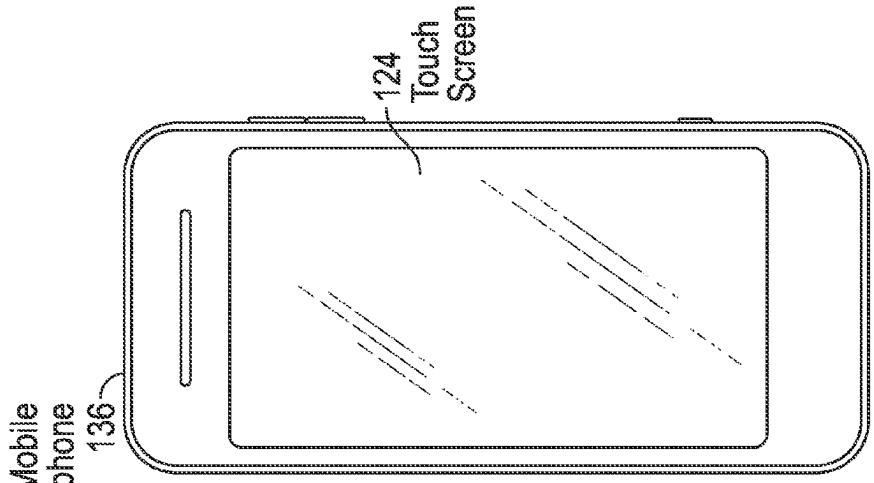


FIG. 1A

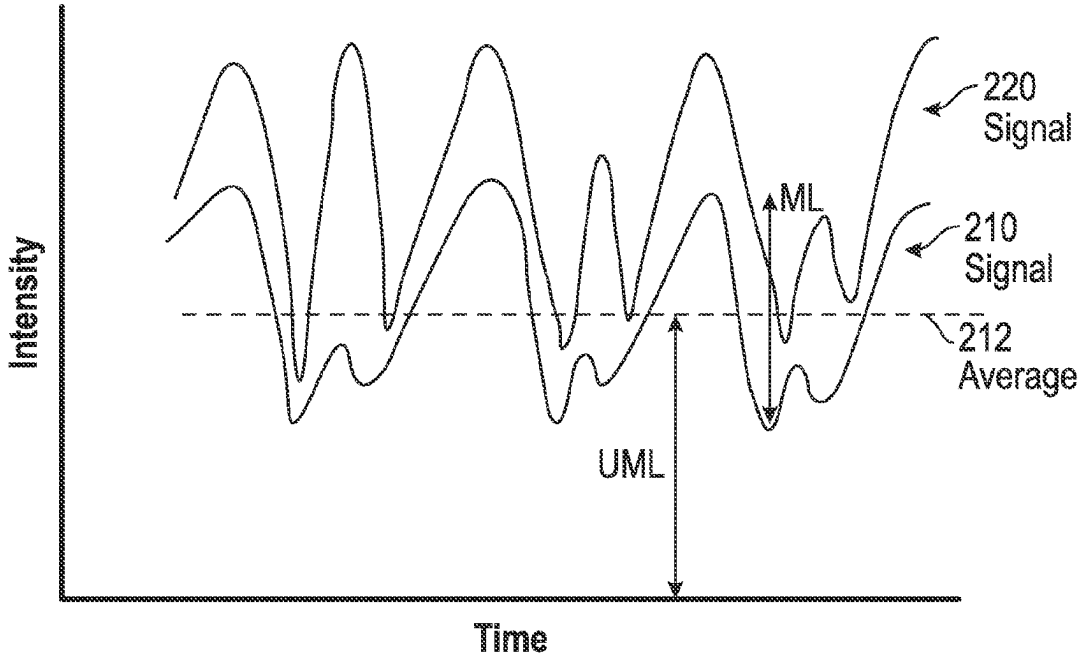


FIG. 2

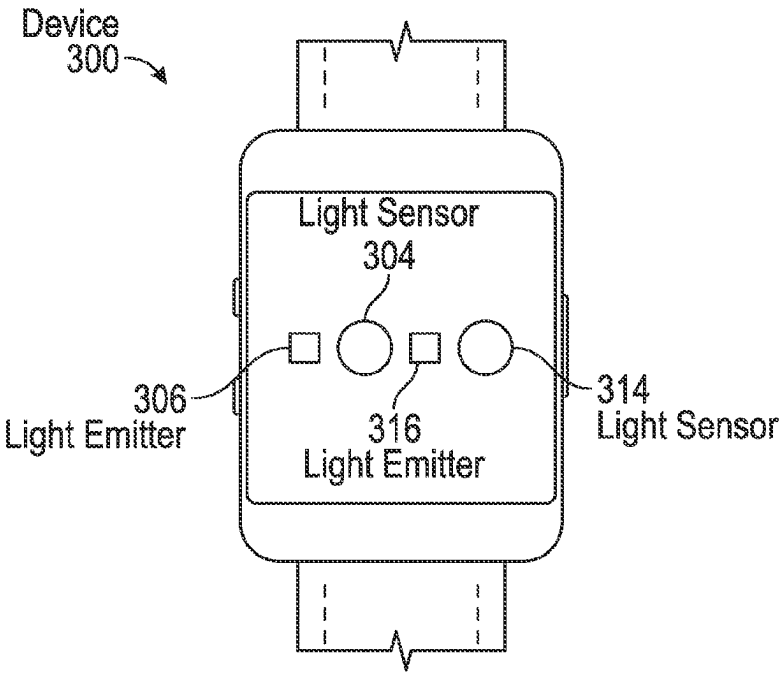


FIG. 3A

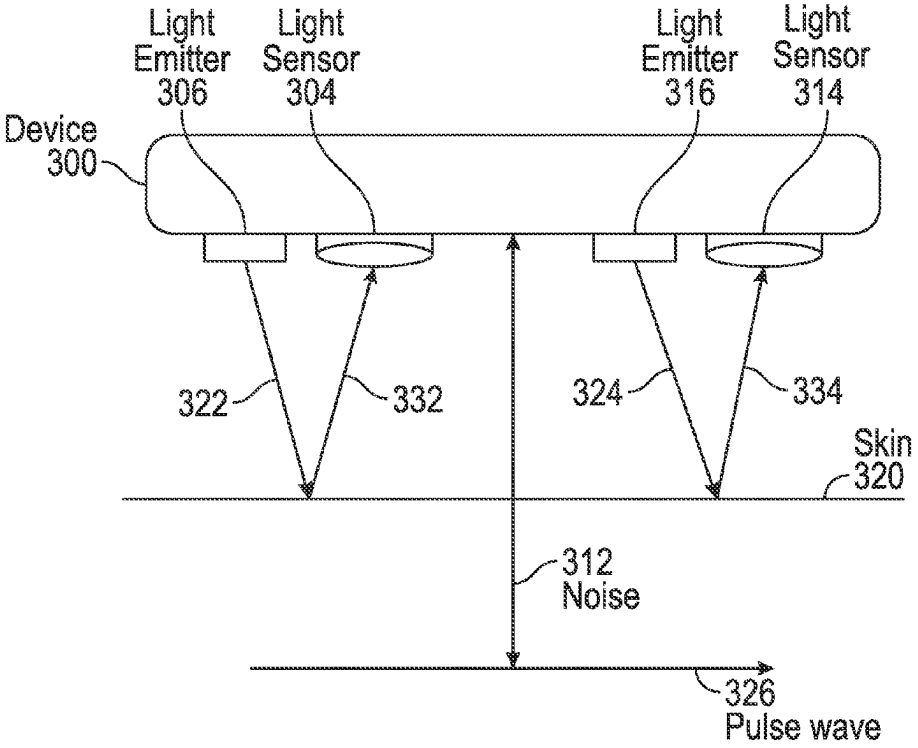


FIG. 3B

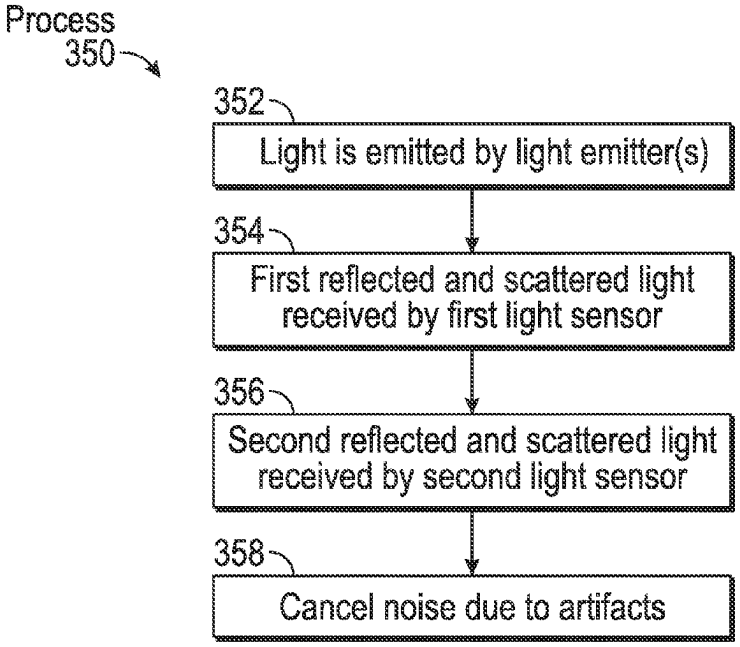


FIG. 3C

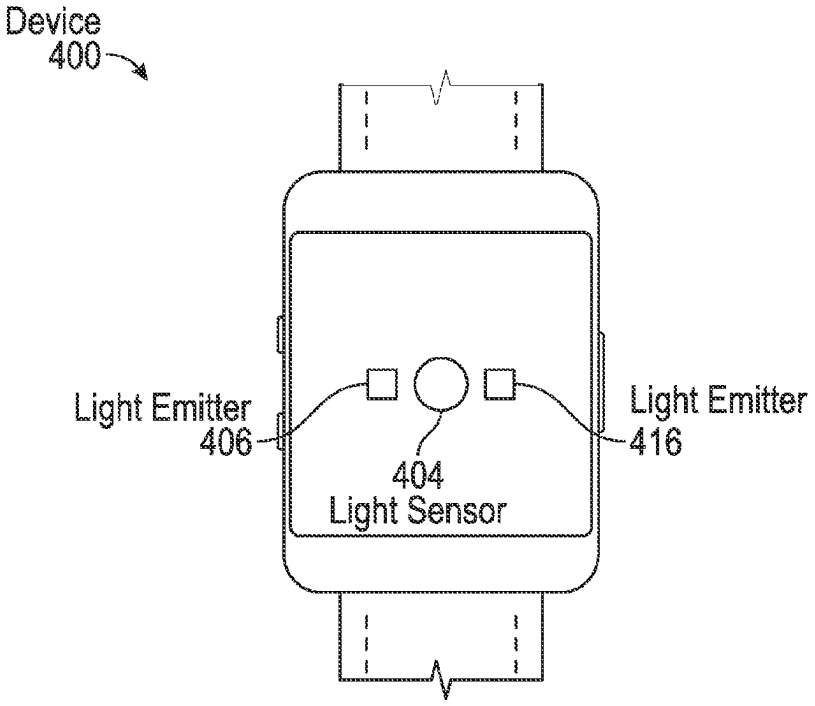


FIG. 4A

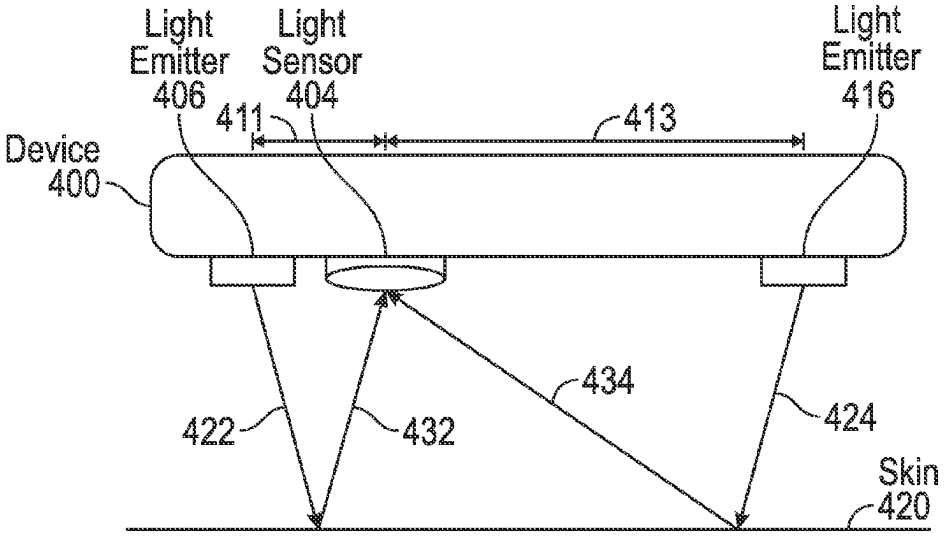


FIG. 4B

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