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Suzuki et al.

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(54) **MOBILE DEVICE AND COMBO COIL MODULE**

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- (73) Assignees: **Sony Corporation**, Tokyo (JP); **Sony Mobile Communications, Inc.**, Tokyo (JP)
- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 676 days.

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H02J 7/02 (2016.01)
H01F 27/36 (2006.01)
H01F 38/14 (2006.01)
H04B 5/00 (2006.01)

(52) **U.S. Cl.**
CPC **H02J 7/025** (2013.01); **H01F 27/365** (2013.01); **H01F 38/14** (2013.01); **H02J 50/12** (2016.02); **H04B 5/0037** (2013.01); **H04B 5/0093** (2013.01)

(58) **Field of Classification Search**
CPC H01F 38/14; H01F 27/365; H02J 7/025; H02J 50/12; H04B 5/0037; H04B 5/0093
See application file for complete search history.

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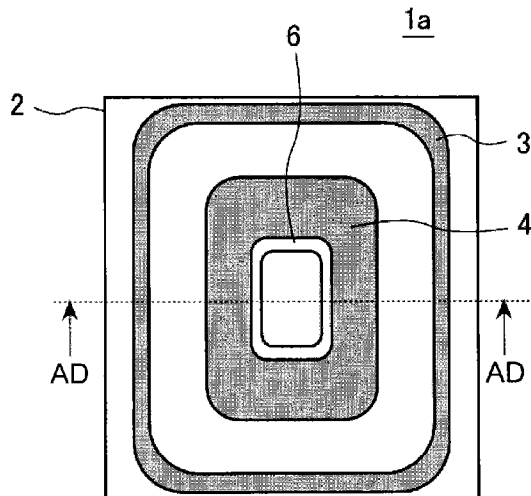
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(57) **ABSTRACT**

An apparatus may include a near field communication (NFC) antenna coil and a wireless power receiving coil. The NFC antenna coil and the receiving coil may be arranged on a magnetic sheet. The wireless power receiving coil may be concentrically disposed on the magnetic sheet within an inner periphery of the NFC antenna coil. An inner diameter of the wireless power receiving coil may be greater than or equal to an inner diameter of reference listener antenna coil RL-6, of the reference listener coils specified by the NFC forum.

19 Claims, 12 Drawing Sheets



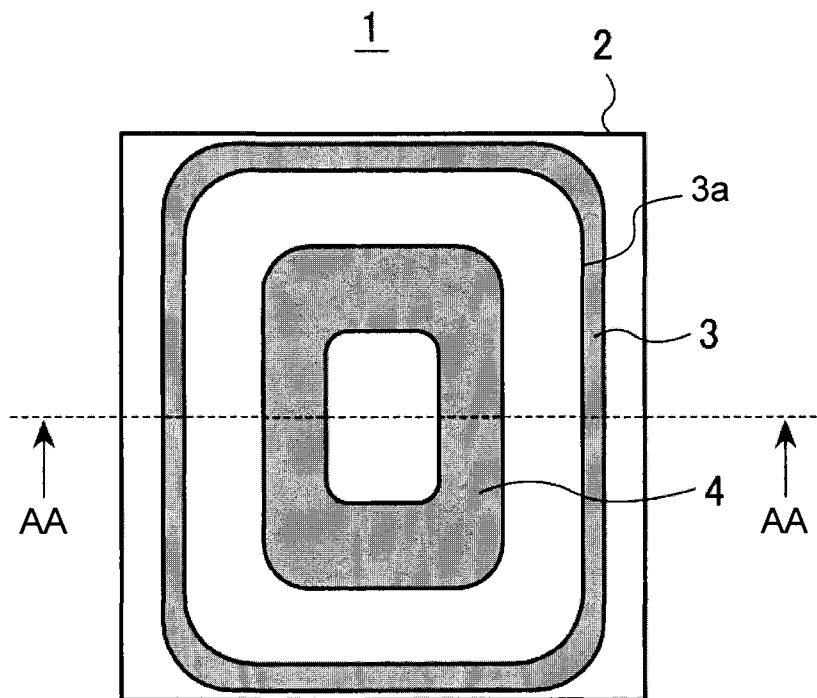


Figure 1A

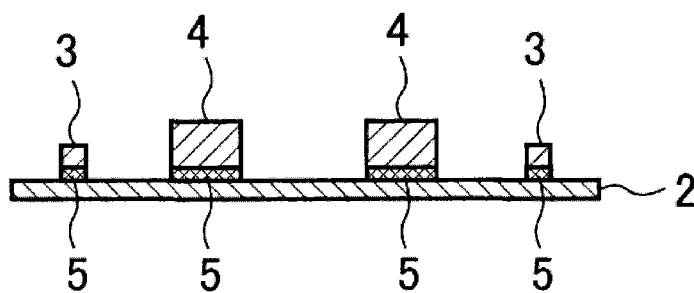


Figure 1B

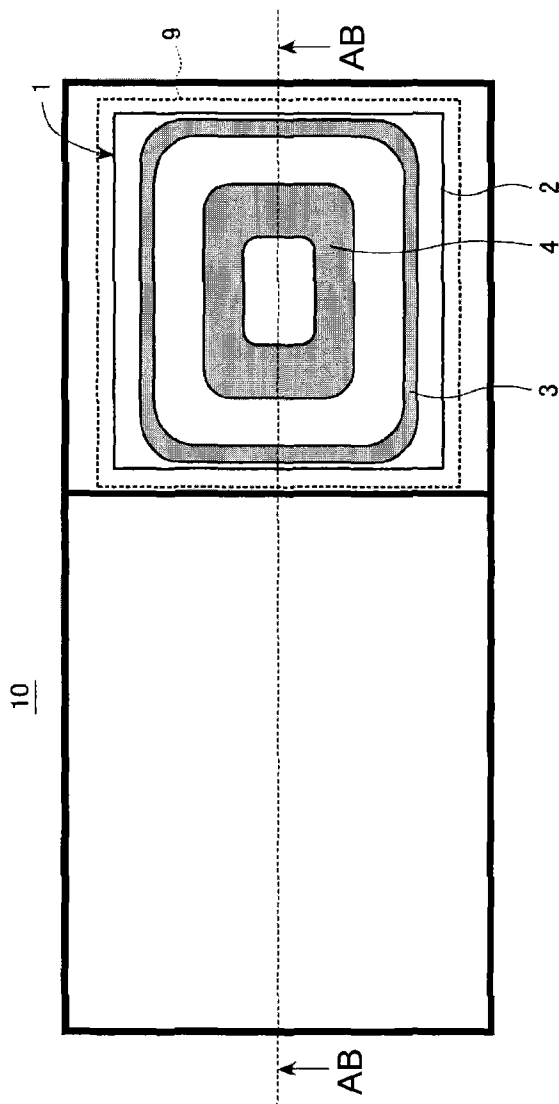


Figure 2A

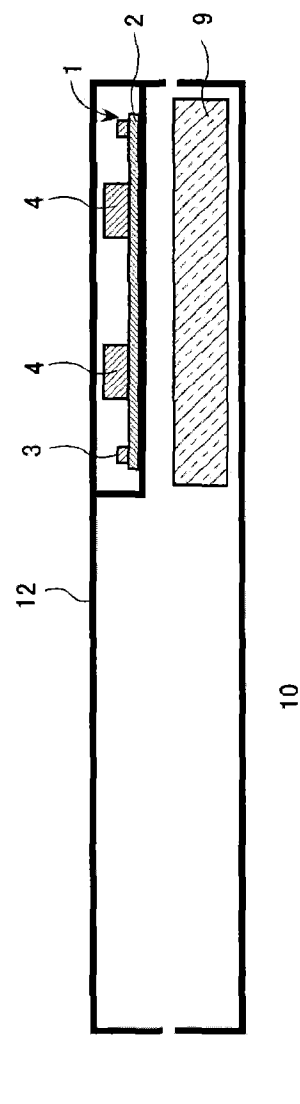


Figure 2B

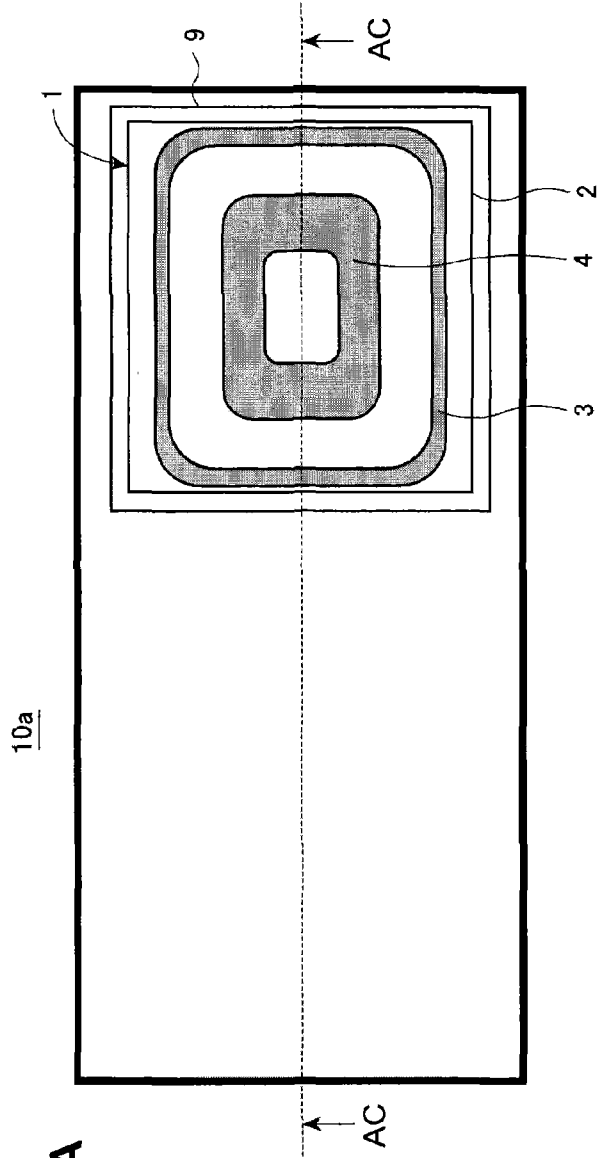


Figure 3A

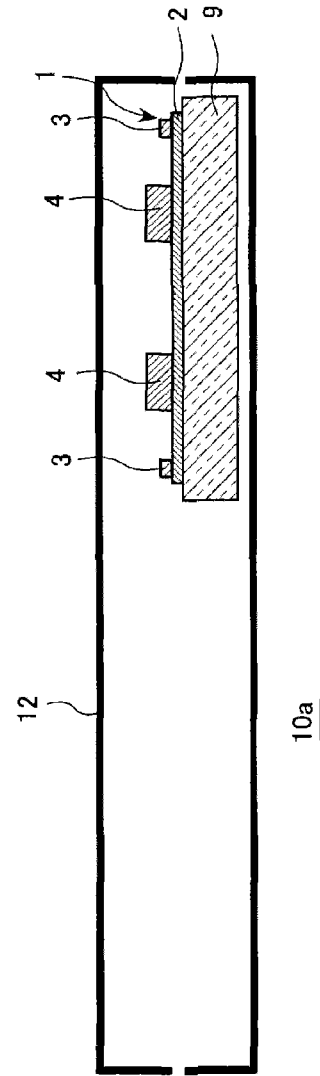


Figure 3B

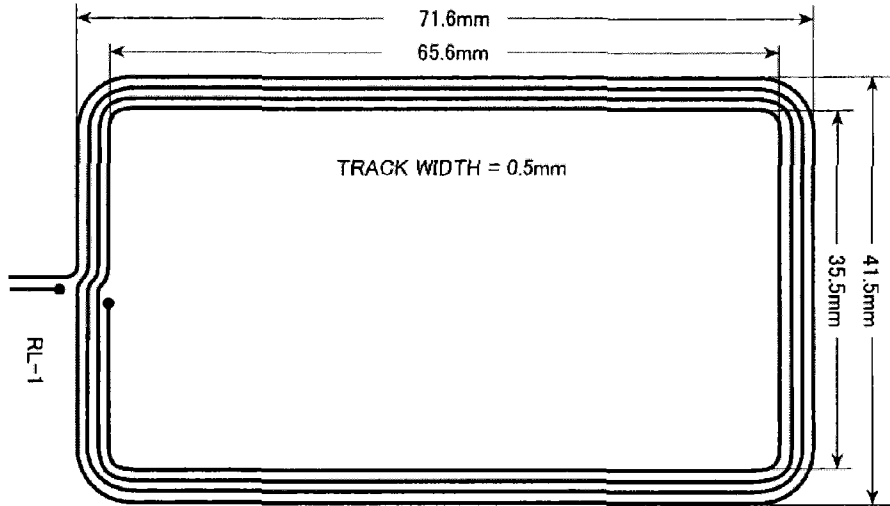


Figure 4A

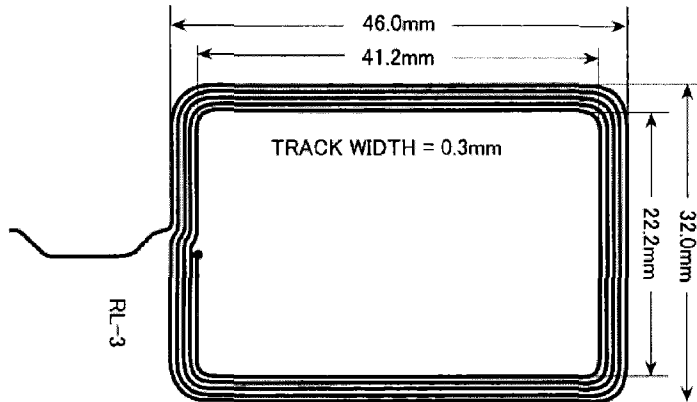


Figure 4B

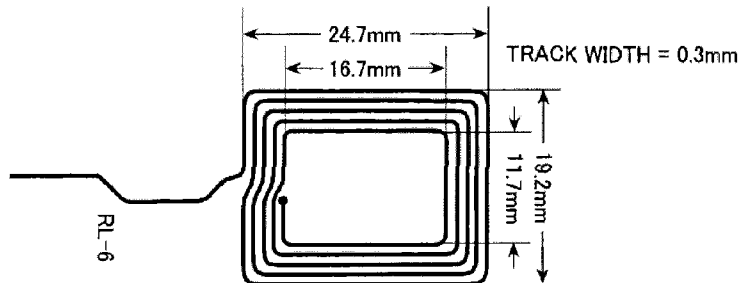


Figure 4C

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