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Matero et al.

[45] Date of Patent: Jun. 16, 1998

[54] ANTENNA SWITCHING CIRCUITS FOR RADIO TELEPHONES

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[75] Inventors: **Jorma Matero**, Oulu; **Matti I. Kangas**, Oulunsalo, both of Finland

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[73] Assignee: **Nokia Mobile Phones Limited**, Salo, Finland

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WO 94/14247	6/1994	WIPO

[21] Appl. No.: 692,496

[22] Filed: Aug. 7, 1996

[51] Int. Cl.⁶ H04B 1/44

[52] U.S. Cl. 455/78; 455/84; 333/101; 370/280

[58] Field of Search 333/101, 103-104; 455/73, 78, 82, 83, 84, 575, 132, 272, 99, 129, 345; 370/276, 277, 278, 280, 282, 294

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Primary Examiner—Nguyen Vo
Attorney, Agent, or Firm—Perman & Green, LLP

[57] ABSTRACT

Disclosed are various embodiments of circuitry for coupling first and second transceivers of a dual band radio telephone to integral and external antennas. The circuitry uses impedance matching lengths of transmission lines and switches arranged to provide a minimum insertion loss. Also disclosed is an embodiment for use with a single band radio telephone, such as a digital TDMA radio telephone that either transmits or receives at any given time. Also disclosed is an antenna switching arrangement for a dual band phone that eliminates a requirement for duplexers.

17 Claims, 6 Drawing Sheets

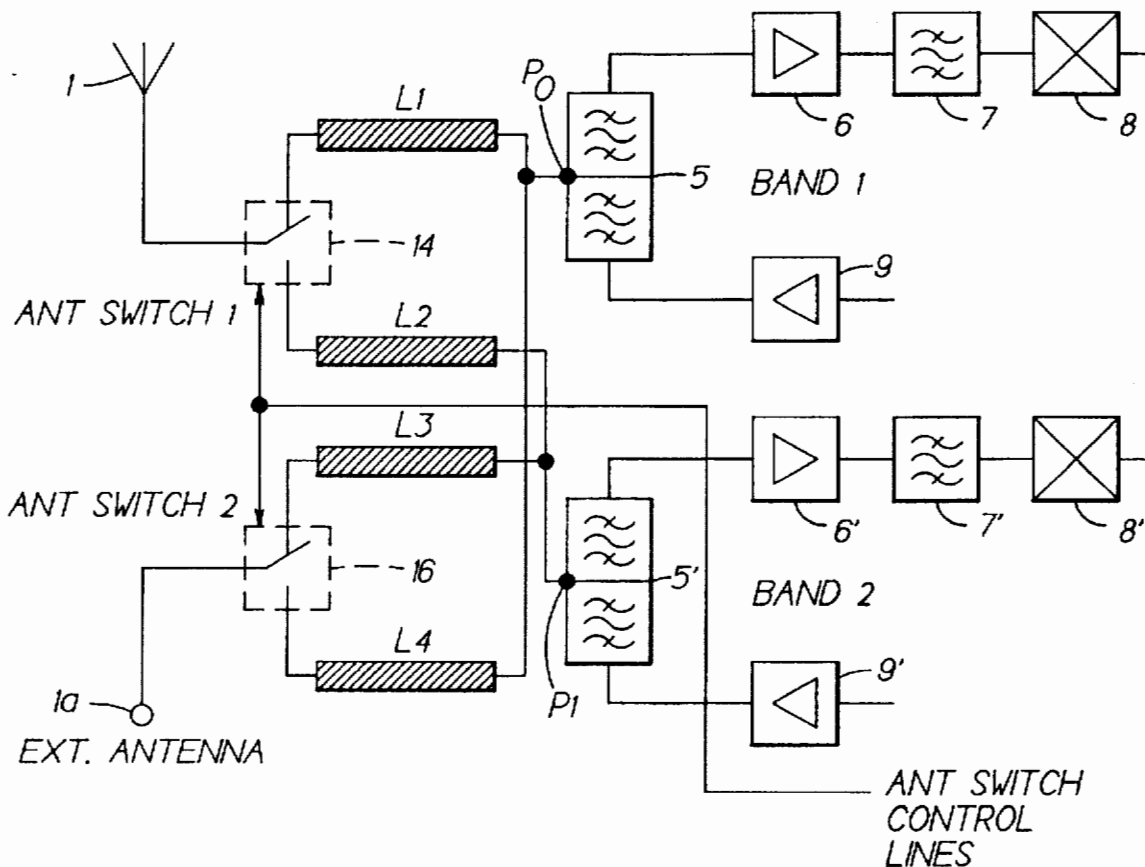


FIG. 1
PRIOR ART

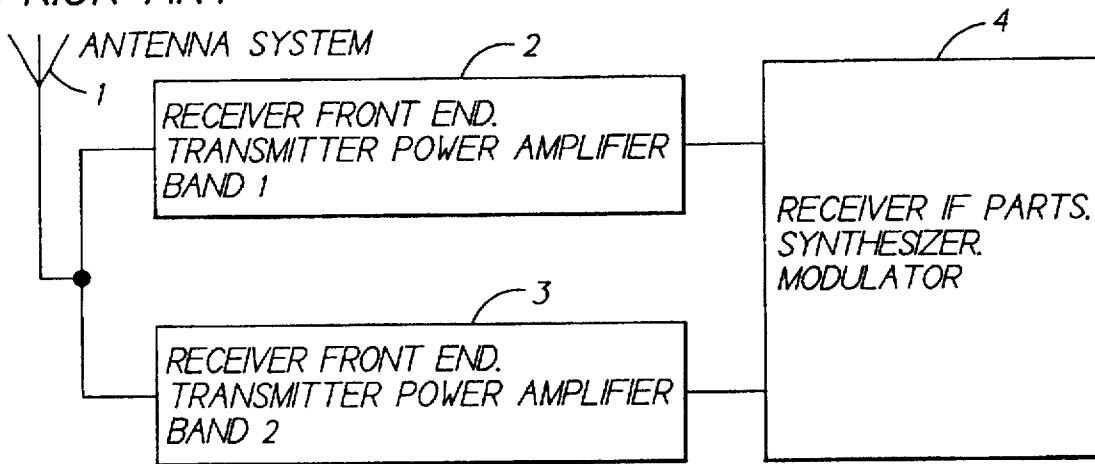


FIG. 2
PRIOR ART

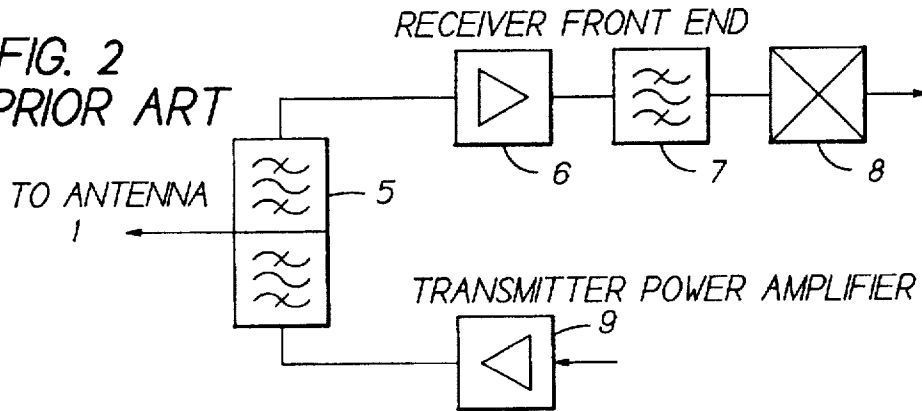
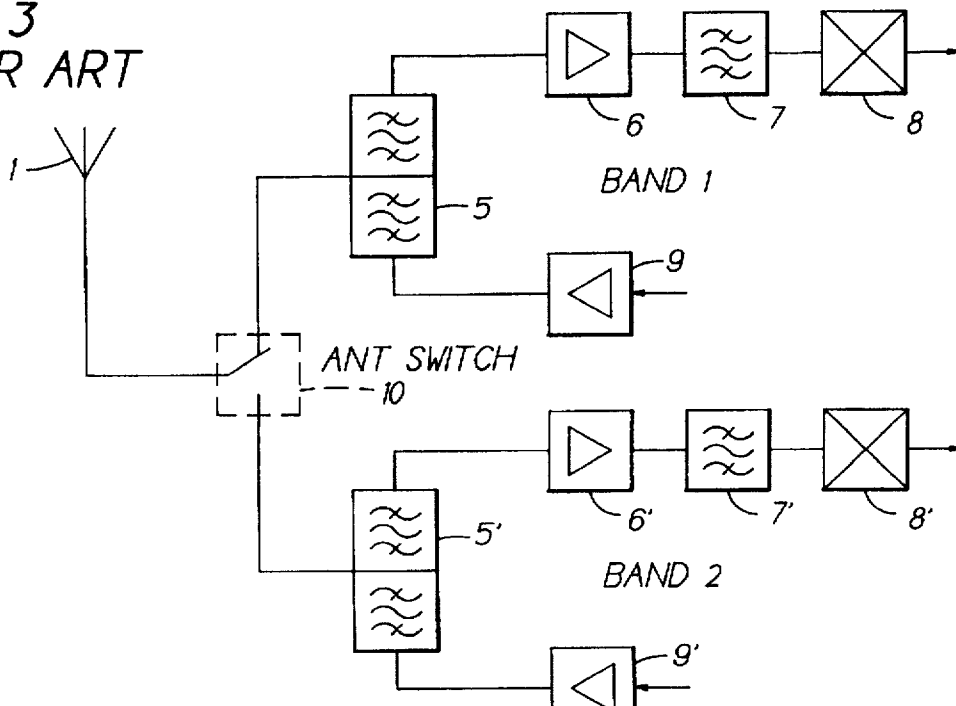
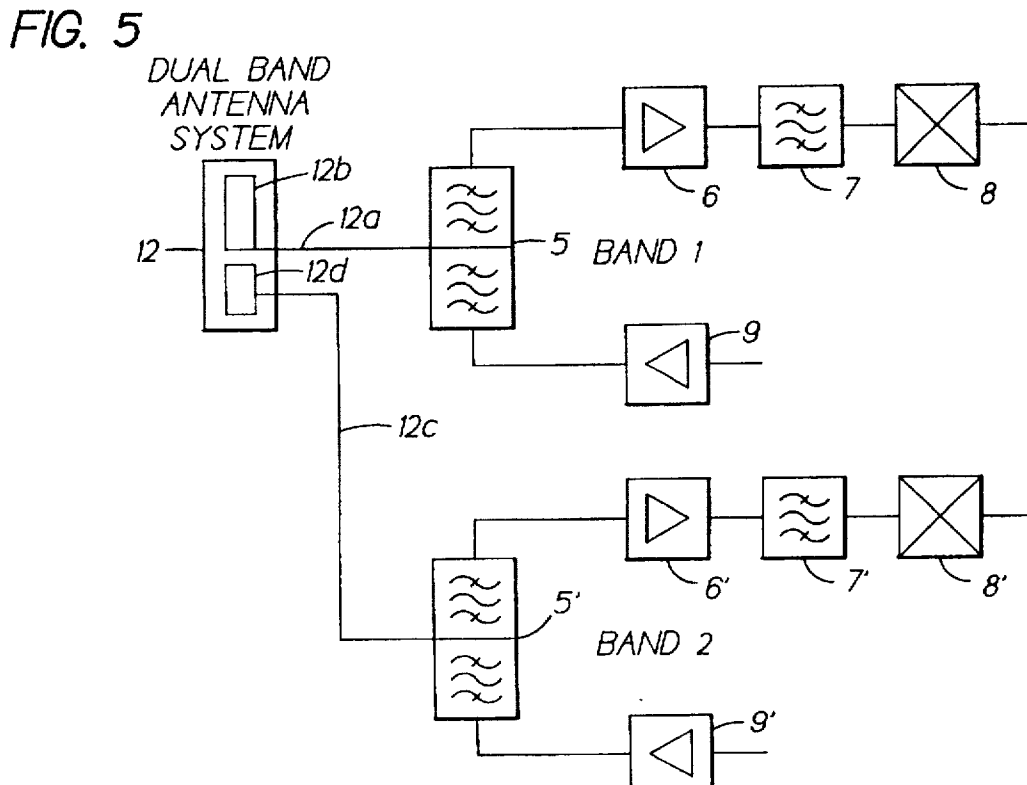
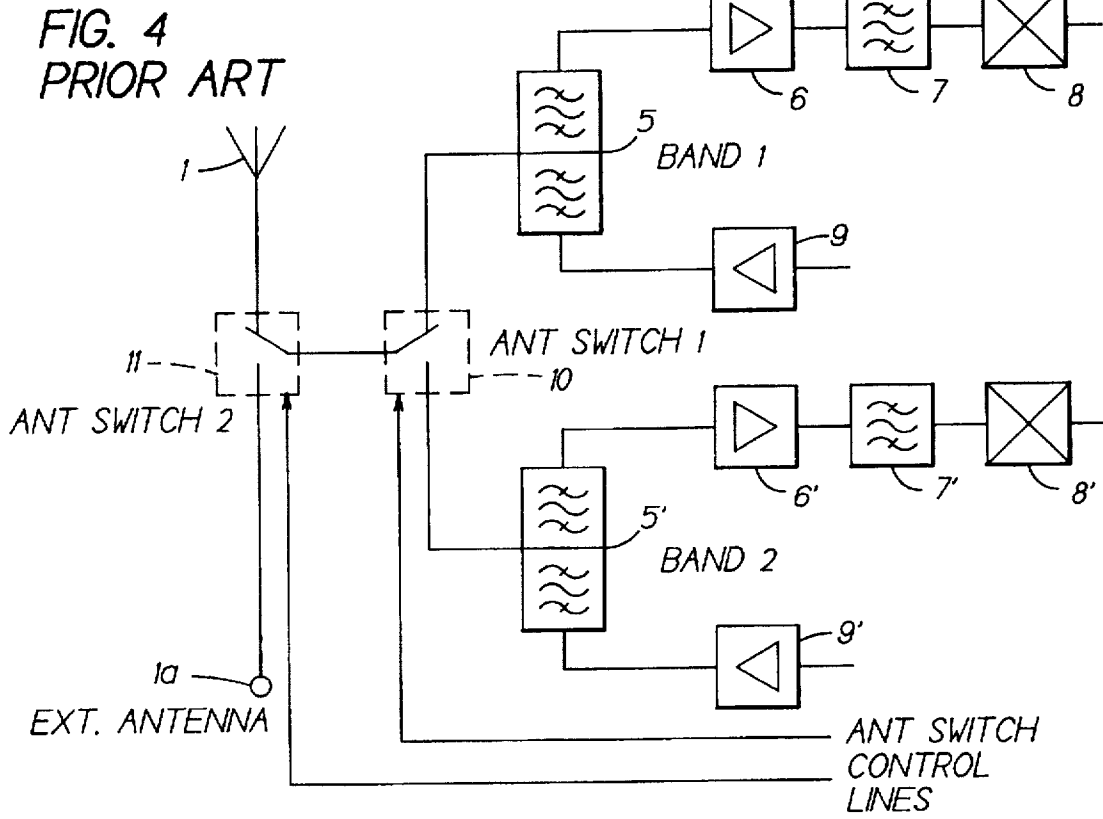


FIG. 3
PRIOR ART





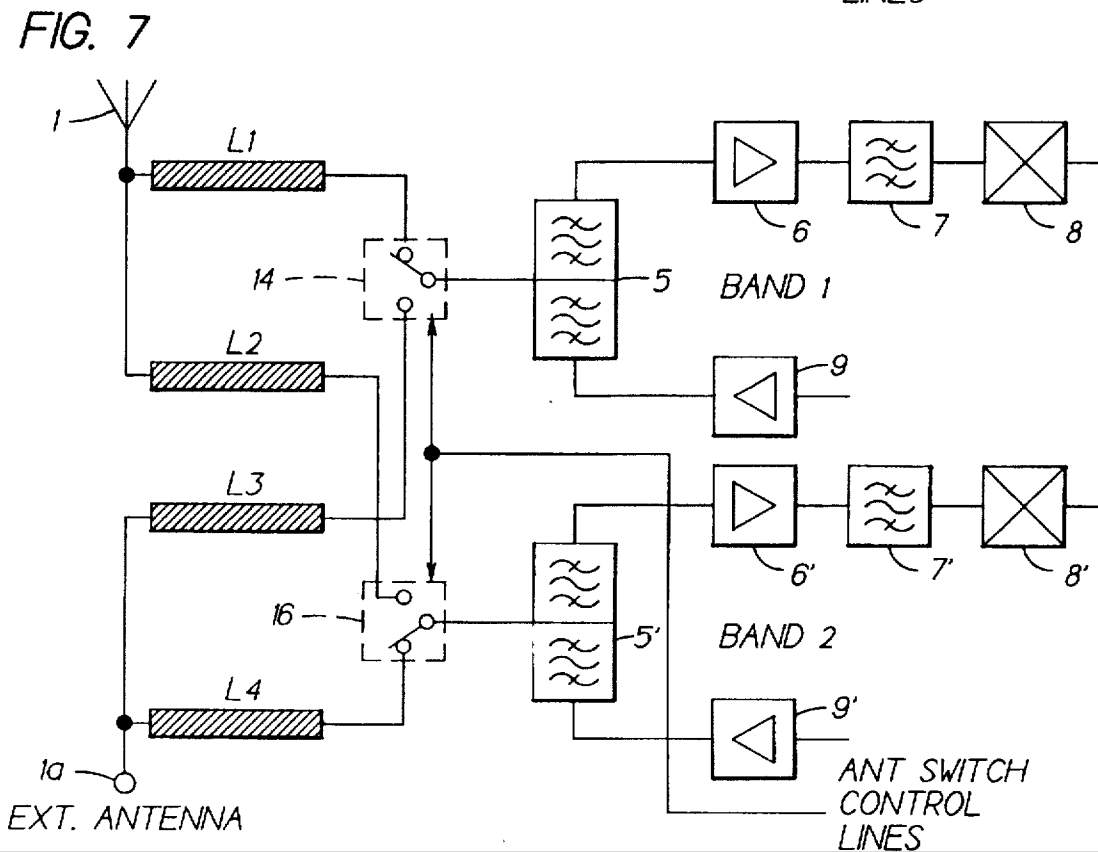
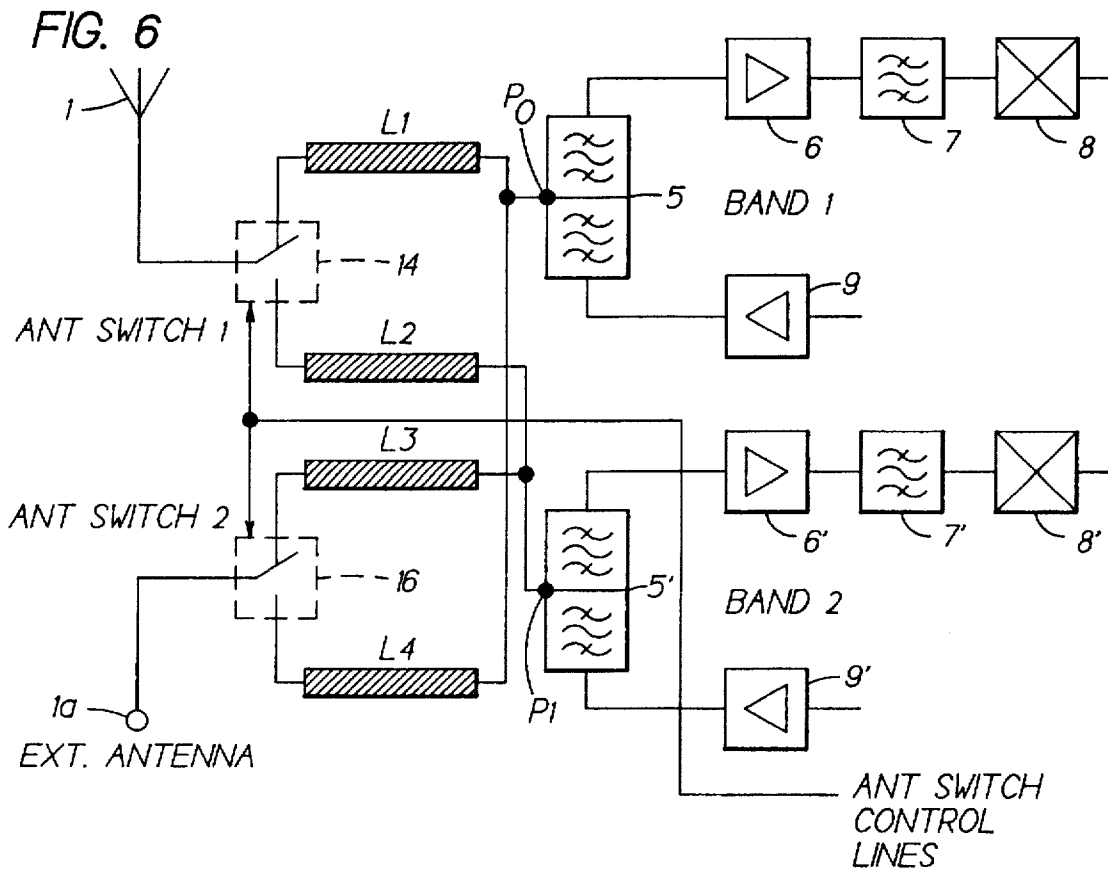


FIG. 8
PRIOR ART

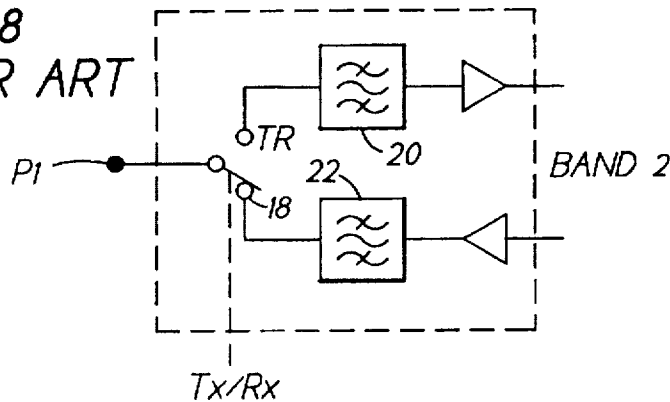


FIG. 9
PRIOR ART

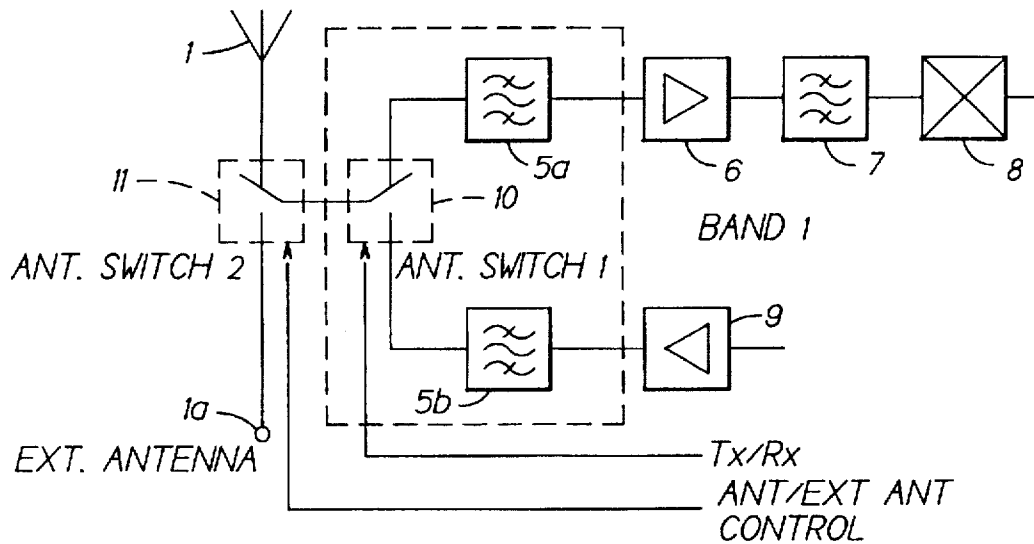
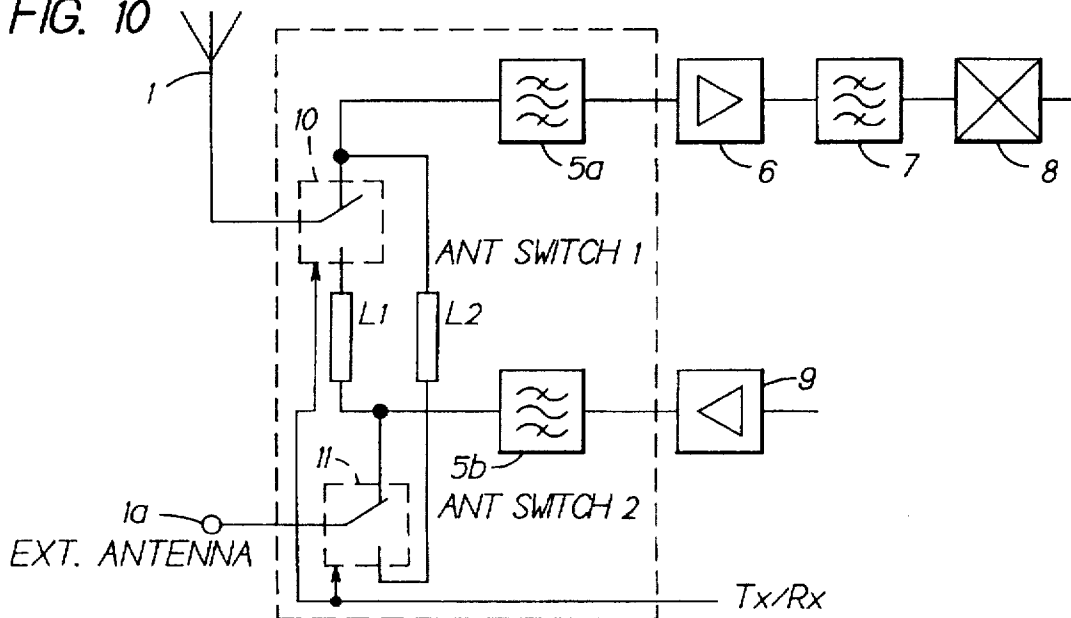


FIG. 10



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