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(54) Title: REAL-TIME LOCATION DETERMINATION FOR IN-BUILDING DISTRIBUTED ANTENNA SYSTEMS

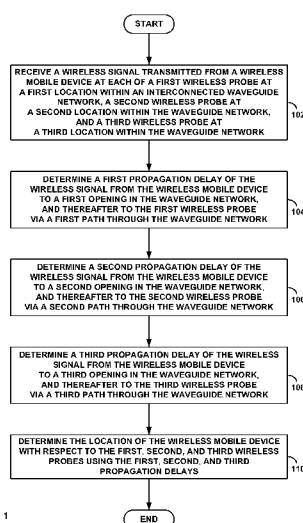


FIG. 1

(57) Abstract: A system for determining the location of a wireless mobile device with respect to an interconnected network of wireless transmission waveguides is disclosed. The interconnected network could be interconnected ducts of an HVAC system in a building. Multiple wireless probes are placed at multiple locations within the HVAC duct system (or similar interconnected network of waveguides). Each probe may detect a common signal from a wireless mobile device and independently preserve arrival time information of the detected signal, wherein the signal propagates to probes by way of a free-space path to an opening in one or another duct, and thereafter to the probes via one or another path through the interconnected ducts, which act as wireless transmission waveguides. By correlating timing information of a signal received at three or more probes, a location of the mobile wireless device may be determined by one or another form of triangulation.