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(54) **COMMUNICATIONS SYSTEM INCLUDING PHASED ARRAY ANTENNA PROVIDING NULLING AND RELATED METHODS**
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(57) **ABSTRACT**

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A phased array antenna may include a plurality of antenna elements, at least one respective phase shifter connected to each antenna element, and at least one respective gain element connected to each antenna element. The phased array antenna may further include at least one controller for determining and controlling both phases and gains of the phase shifters and gain elements, respectively, to provide beamsteering in a first direction for a signal of interest. The controller may also iteratively determine and control phases of the phase shifters to provide a null in a second direction for a signal not of interest, and without determining or controlling gains of the gain elements.

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H01Q 3/24 (2006.01)
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(58) **Field of Classification Search** 342/154,
342/157, 368, 372, 373
See application file for complete search history.

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40 Claims, 10 Drawing Sheets

