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(71) Applicant: **CommScope Technologies LLC**
Hickory, NC 28602 (US)

(72) Inventors:
• **KASANI, Kumara Swamy**
505209 Hodavari Khani, Telangana State (IN)
• **NARAGANI, Lenin**
122002 Haryana (IN)

(74) Representative: **Parker, Andrew James**
Meissner Bolte Patentanwälte
Rechtsanwälte Partnerschaft mbB
Postfach 86 06 24
81633 München (DE)

(54) **TWIN-BEAM BASE STATION ANTENNAS HAVING THINNED ARRAYS WITH TRIANGULAR SUB-ARRAYS**

(57) Twin-beam base station antennas include first and second arrays that each have a plurality of radiating elements that are mounted to extend forwardly from respective first and second panels of an angled reflector. The radiating elements in each array extend in three columns, with the radiating elements in the middle column vertically offset from the radiating elements in the outer columns. The antennas further include first and second phase shifters. More than half of the outputs of the first phase shifter are connected to respective first sub-arrays, where each first sub-array includes one radiating element from each of the three columns in the first array, and more than half of the outputs of the second phase shifter are connected to respective second sub-arrays, where each second sub-array includes one radiating element from each of the three columns in the second array.

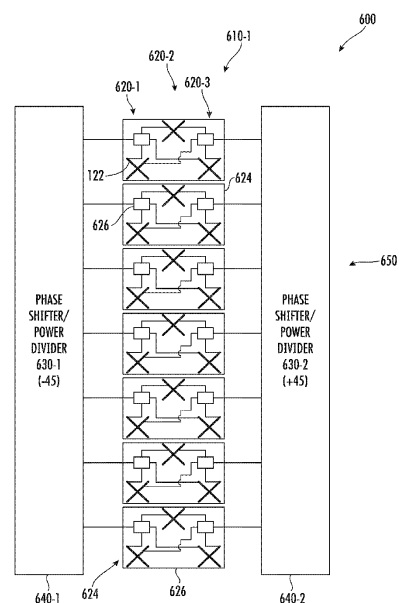


FIG. 6C