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(72) Inventors; and

(71) Applicants : **GUDI, Manoj** [IN/IN]; 6 Shyam Ashish,
Near Panchayat Well, Dombivli East, Thane District, Ma-
harashtra 421201 (IN). **CHATURVEDI, Prateek** [IN/IN];
No.7c, Hollyhock, Cosmos Lounge, Manpada, Thane
West, Thane, Maharashtra 400610 (IN).

(74) Agent: **KHURANA & KHURANA, ADVOCATES & IP
ATTORNEYS**; E-13, UPSIDC, Site-IV, Behind-Grand
Venice, Kasna Road, Greater Noida, National Capital Re-
gion, Uttar Pradesh 201310 (IN).

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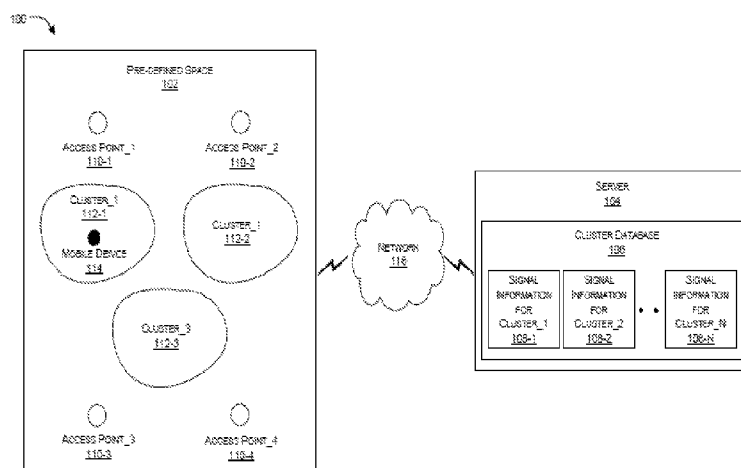


FIG. 1

(57) Abstract: A method and system for positioning a mobile device in a predefined space using wireless signals transmitted by access points is disclosed. In an initial mapping stage, the predefined space is mapped to study the signal characteristics of positions in that space. Positions in the predefined space that are close to and receive signals from the same access points and have similar signal characteristics are grouped into clusters. Positioning of a mobile device in the predefined space is carried out in two stages. In the first positioning stage, the mobile device is assigned to one of the clusters. In a second positioning stage, the position of the mobile device is determined by applying a prediction method assuming that the assigned cluster is the new universe. Data from INS (Inertial Navigation System) sensors like accelerometers, gyroscopes and magnetometers are used to further refine the position.