than the front/upper opening, to thereby prevent the medallion 11 from passing through the cavity.

[0058] Similarly, the medallion 11 can have a tapered shape having an angled edge along an outer peripheral surface, and the edge may be angled with a predetermined angle equal to that of the cavity (e.g., 3 degrees (+/- 1 degree) relative to a right-angled edge, corresponding to an angle of 87 degrees (range of 86-88 degrees) relative to the front or back surface), as also shown in FIG. 2C. The angled edge of the medallion is such that the medallion has a smaller dimension (e.g., smaller diameter) on the front/upper surface 11a of the medallion 11 relative to the back/lower surface 11b of the medallion 11. As such, the combination of angled edges of the medallion 11 and cavity in the accessory 201 ensure that the medallion can only be placed in the accessory 201 in such a way that the front surface 11a of the medallion 11 faces outwards while a back surface 11b faces rearwards. Additionally, the medallion 11 may be sized to be slightly smaller than the cavity so as to ease the fit of the medallion 11 within the cavity. For example, the medallion 11 may have an outer dimension, such as an outer diameter, that is 0.75mm (e.g., range of 0.5-1 mm) smaller than the inner dimension/diameter of the cavity to enable the medallion 11 to be inserted into the cavity even in the medallion is not perfectly aligned with the cavity and/or is tilted with respect to the cavity.

[0059] In summary, the medallion can thereby easily and securely couple to the accessory 201 by virtue of the following features. The medallion 11 has an angled edge, sloping at a predetermined angle (e.g., 3 degrees) from the "front" surface of the medallion to the "rear" surface so as to align with the oppositely formed angled edge of the accessory 201. The angled edge design allows for alignment of the medallion 11 to the accessory by inserting the medallion in the "rear" side of the accessory. Since the medallion 11 can only be inserted into or removed from the rear of the accessory 201, the forces needed to dislodge the medallion 11 from the accessory 201 are rearward and thus opposed to a body of a guest wearing the accessory 201 (and/or opposed to another surface preventing the easy dislodging of the medallion) when the medallion is in the accessory 201. As such, the medallion 11 cannot readily be dislodged or removed from the accessory 201 when the accessory 201 is worn.

[0060] The foregoing description has focused on medallions 11 having circular shapes, and corresponding cavities having circular shapes. However, this disclosure is not limited to such medallions and cavities. More generally, medallions 11 and corresponding cavities in

products to the guests 12. Exemplary crew members 40 can include the crew, staff members, employees, and hosts of the hotels and/or resorts. The crew member 40 is shown as operating a crew device 402. The crew device 402 can include a hand-held, mobile, and/or portable electronic device configured for wireless communication, optionally with mobile computing capabilities. Exemplary crew devices 402 can include two-way radio transceivers, walkie-talkies, mobile phones, smart phones, tables, and/or the like. The crew device 402 can be configured to communicate with the guest devices 11 and/or the sensors 15 via one or more selected wireless communication technologies. Additionally and/or alternatively, the crew device 402 can communicate with the system servers 21 via the communications network 19. Additionally and/or alternatively, the crew device 402 can, in a manner similar to the guest devices 11, communicate with the interface devices 17 (shown in FIG. 1) and/or the end devices 18 (shown in FIG. 9).

[0158] The crew device 402 is shown as being coupled with an antenna device 300 that is configured to emit signals supplied from the crew device 402. Additionally and/or alternatively, the antenna device 300 can receive a signal and transmit the signal to the crew device 402. Stated somewhat differently, regardless of whether the crew device 402 includes a built-in antenna and/or whether the built-in antenna can provide functionalities needed in the guest engagement system 10, the antenna device 300 can function as an interface between the crew device 402 and other wireless networks and/or devices to provide additional and/or alternative wireless communication capabilities of the crew device 402. Further, because the antenna device 300 can provide wireless communication functionalities independent of the built-in capabilities of the crew device 402, hardware and/or software of the antenna device 300 can be programmed and/or specifically developed even if the crew device 402 is commercially acquired and cannot be reprogrammed or customized. Advantageously, the crew, employees, and hosts of the hotels and resorts can fully utilize the guest engagement system 10 with the specifically customized antenna device 300.

[0159] The antenna device 300 is shown as being located in and/or on an optional accessory 400 for the crew device 402. The accessory 400 can be attached to, and/or be portable with, the crew device 402. In one embodiment, the accessory 400 can include a casing 420 (shown in FIG. 27) for at least partially enclosing the crew device 402. The accessory 400 can include additional elements that can provide selected functionalities. Hardware and/or software

antenna device 300, the minimum being more visible than a minimum of the gain in FIG. 24A. Thus, the peak directivity of the first wireless communication antenna 320 is improved via the combination with the second wireless communication antenna 340. The antenna device 300 as shown in FIG. 25A can be achieved via optimization to achieve resonance center frequency (that is, resonance of the desired frequency of, for example, 2.45 GHz) in a region enclosed between top and bottom covers 380A, 380B (shown in Fig. 23). FIG. 25B is a plot showing realized gain as a function of frequency.

[0183] FIG. 26A is a 3D radiation pattern of the antenna device 300 including the first wireless communication antenna 320, the second wireless communication antenna 340 and the antenna carrier 380 after a selected optimization process. Stated somewhat differently, the antenna device 300 shown in FIG. 26A is achieved by further optimization via tuning, in comparison with the antenna device 300 shown in FIG. 25A. The radiation pattern indicates that a gain of the antenna device 300 reaches a maximum at an end region thereof along the z direction and is greater in comparison with the gain of the radiation pattern in FIG. 24A. Further, the gain reaches a minimum near a middle region of the antenna device 300, the minimum being more visible than a minimum of the gain in FIG. 24A. Thus, the peak directivity of the first wireless communication antenna 320 is improved via the combination with the second wireless communication antenna 340. FIG. 26B is a plot showing realized gain as a function of frequency.

[0184] Turning to FIG. 27, an exemplary accessory 400 is shown as including the casing 420 and the antenna device 300 attached to the casing 420. The casing 420 can at least partially enclose the crew device 402 (shown in FIG. 13). The casing 420 is shown as having a planar shape parallel to the x-z plane. When the crew device 402 is in the casing 420, the side of the crew device 402 of the greatest surface area can be parallel to the x-z plane.

[0185] The antenna device 300 can optionally be movably coupled to the casing 420 such that the antenna device can move relative to the casing 420, and/or the crew device 402, along a direction 362. For example, the moving can include a sliding motion. Stated somewhat differently, the antenna device 300 can be slidably coupled to the casing 420 such that the antenna device 300 can slide relative to the casing 420, and/or the crew device 402. Because an electromagnetic field generated in the crew device 402 and/or the casing 420 can change a radiation pattern of the antenna device 300, sliding the antenna device 300 can adjust the radiation

assembly 470 (shown in FIG. 29), the casing 420 and/or the crew device 402. Because circuits (not shown) in the PCB assembly 470, the casing 420 and/or the crew device 402 can emit the electromagnetic field that can change the radiation pattern of the antenna device 300, the first wireless communication antenna 320 can be detuned (or loaded) by the electromagnetic field at the resonant frequency and thus become omni-directional (or less directional). Stated somewhat differently, the first wireless communication antenna 320 can have more equal gain in all directions. Advantageously, the antenna device 300 can sense proximity of the guest devices 11 (shown in FIG. 13) in any directions when the crew member 40 (shown in FIG. 13) is waiting for instruction or commands from the guests 12 (shown in FIG. 13).

[0195] Turning to FIG. 31, the antenna device 300 is shown as being in a deployment position. In the deployment position, the first wireless communication antenna 320 can be located distally from the PCB assembly 470 (shown in FIG. 29), the casing 420 and/or the crew device 402 by being moved over a selected distance from the retreat position. Because the circuits (not shown) in the PCB assembly 470 (shown in FIG. 29), the casing 420 and/or the crew device 402 can become more distal from the first wireless communication antenna 320, the electromagnetic field from the circuits can become less effective in detuning the first wireless communication antenna 320. The first wireless communication antenna 320 can thus become more directional. Stated somewhat differently, the first wireless communication antenna 320 can have a greater gain in the direction 360. Thus, instead of installing a relatively omni-directional antenna and a directional antenna and switching therebetween, the first wireless communication antenna 320 can be relatively omni-directional or directional by changing positions. Advantageously, structure and operation of the antenna device 300 can be simplified. The antenna device 300 can be connected with the accessory 400 and/or the crew device 402 via suitably routed cables (such as a coaxial cable) such that the cable connection can be maintained during transition between the retreat and deployment positions. In contrast to the antenna device 300, conventional antennas do not exhibit directional radiation patterns in a form factor of a handheld electronic device. Especially, conventional antennas exhibit even less directional radiation patterns in a handheld electronic device with integrated NFC into the antenna structure. An additionally and/or alternative unique aspect of the antenna device 300 is the purposeful altering of the radiation pattern from directional to isotropic based upon deployment of the antenna device 300.